ETHIOPIAN
Emergency Obstetric and Newborn Care (EmONC) Assessment 2016

Final Report

Ministry of Health

Ethiopian Public Health Institute

COLUMBIA UNIVERSITY | MAILMAN SCHOOL of PUBLIC HEALTH
AVERTING MATERNAL DEATH AND DISABILITY (AMDD)

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Ethiopian Public Health Institute
Addis Ababa, Ethiopia

Federal Ministry of Health
Addis Ababa, Ethiopia

Averting Maternal Death and Disability (AMDD), Columbia University
New York, USA

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Foreword

The 2016 Ethiopian Emergency Obstetric and Newborn Care (EmONC) Assessment is a national census of all facilities that provided delivery services in 2015. It was conducted by the Ethiopia Public Health Institute (EPHI). The Averting Maternal Death and Disability Program (AMDD) of the Heilbrunn Department of Population and Family Health at Columbia University's Mailman School of Public Health provided technical support for the survey. The first EmONC assessment in Ethiopia was conducted in 2008. The 2016 assessment differs from that of 2008 because it included a proposed set of newborn signal functions, information on the availability of maternal waiting homes/rooms, morbidity reviews, and information from the woreda, zonal and regional levels of the health system. Report write-up and analysis of results were mainly conducted by staff members of EPHI and AMDD.

The primary objective of the 2016 EmONC assessment was to provide up-to-date information for policy makers, planners, researchers and programme managers, which would allow guidance in the planning, implementation, monitoring and evaluation of maternal and newborn services in the country. The primary audience of the findings will be the Federal Ministry of Health and health development partners for programming purposes.

The 2016 EmONC assessment collected information on the topics of infrastructure, human resources for maternal and newborn health, essential drugs, equipment and supplies, facility service statistics, emergency obstetric and newborn signal functions, providers' knowledge of maternal and newborn care, health provider supervisory support and motivation, maternal and newborn referral, maternity waiting homes and chart reviews for the partograph, caesarean deliveries, women who survived obstetric complications, maternal deaths, and newborn complications. Generally, findings are presented for the nation, the nine regional states and two city administrations. In addition, results are provided by urban and rural location of facilities, and managing authority. Findings from the assessment indicate marked improvements in infrastructure, utilization of services, and health outcomes since the first assessment eight years ago.

It is our hope that the findings and recommendations will be taken into consideration by the government, health development partners and all stakeholders.

EPHI would like to acknowledge several organizations that contributed to the successful completion of the 2016 EmONC assessment including UNICEF, Clinton Health Access Initiative, Children's Investment Fund Foundation, Jhpiego/Ethiopia, and JSI for financial supports. Moreover, EPHI would like to acknowledge WHO, UNFPA, MCSP/Jhpiego - Strengthing BEmONC project, JSI, UNICEF and EmWA for technical support. The Institute extends a special thanks to all the technical working group members of the assessment who contributed to the successful completion of the survey. Special thanks also go to AMDD, supported by the Bill and Melinda Gates Foundation, for their involvement in all activities of the assessment.

Dr. Ebba Abate, Director General of EPHI

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Acronyms and Abbreviations

AMDD	Averting Maternal Death and Disability
ANC	Antenatal Care
AVD	Assisted Vaginal Delivery
BEmONC	Basic Emergency Obstetric and Newborn Care
CAFE	Computer Assisted Field Editing
CAPI	Computer Assisted Personal Interviewing
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CS	Caesarean section
D&C	Dilation and Curettage
DHO	District Health Officer
DOC	Direct Obstetric Complication
DOCFR	Direct Obstetric Case Fatality Rate
E&C	Evacuation and Curettage
EDHS	Ethiopia Demographic and Health Survey
EmNeC	Emergency Newborn Care
EmONC	Emergency Obstetric and Newborn Care
EPHI	Ethiopia Public Health Institute
FMOH	Federal Ministry of Health
FP	Family Planning
FANC	Focused Antenatal Care
HMIS	Health Management Information System
HO	Health Officer
HR	Human Resources
HSDP	Health Sector Development Program
HSTP	Health Sector Transformation Plan
IFSS	Internet File Streaming System
IM	Intramuscular
IV	Intravenous
JSI	John Snow International
KMC	Kangaroo Mother Care
MDSR	Maternal Death Surveillance and Response
MOH	Ministry of Health
MPDSR	Maternal and Perinatal Death Surveillance and Response
MMR	Maternal Mortality Ratio
MNH	Maternal Newborn Health
MVA	Manual Vacuum Aspiration
MWH	Maternity Waiting Home
NGO	Nongovernment Organization
Ob/gyn	Obstetrician or Gynaecologist
PAC	Postabortion Care
PE/E	Pre-eclampsia and Eclampsia

PNC	Postnatal Care
PPH	Postpartum Haemorrhage
SARA	Service Availability and Readiness Assessment
SBA	Skilled Birth Attendant
SNNP	Southern Nations, Nationalities and Peoples
SPA	Service Provision Assessment
STI	Sexually Transmitted Infections
TWG	Technical Working Group
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Emergency Fund
WHO	World Health Organization

Executive Summary

The primary objective of the 2016 Ethiopia EmONC Assessment was to generate evidence on the current availability, utilization, and quality of EmONC services in Ethiopia, and to measure progress since 2008, when the first EmONC Assessment was implemented. This assessment provides comprehensive information on the availability of infrastructure, equipment, essential drugs, and supplies; the range of practices related to user fees; availability, knowledge and motivation of human resources; insight into quality of clinical monitoring and management of labour, caesarean deliveries, maternal deaths, and women and newborns with complications; geographic availability of critical services; status of routine and emergency obstetric and newborn services; implementation of the MDSR system; availability and use of records for MNH services; and availability and functioning of maternity waiting homes and the referral system.

Methodology

The 2016 EmONC assessment was a national cross-sectional census of public and private health facilities that provided maternal and newborn health services. The following report includes results from 3,804 facilities. The assessment used 14 facility-based modules plus modules for woreda, zone, region, and national levels of the health system. Data collectors had at least a bachelor's degree and a health background, and included health officers, laboratory technicians, midwives and nurses. All data collectors attended a 10-day training, and worked in teams of three, with one group member serving as team leader. Field work began in mid-May 2016 and ended mid-December 2016. Table 2.3 summarizes the total number of respondents for each module.

Key findings by chapter

Chapter 3: Emergency Obstetric and Newborn Care Indicators in Ethiopia

- Since 2008, Ethiopia has seen substantial improvement in the availability of EmONC facilities per 500,000 population (UN recommended standards). In 2008, Ethiopia had just 11% of the recommended number of fully functioning EmONC facilities, nationally; in 2016 the proportion increased to 40%. Despite the improvement, a large gap remains to reach 100% of the recommendation.
- The institutional delivery rate was 66 percent in 2016, indicating one third of deliveries continue to be at home. Fourteen percent of expected deliveries took place in functioning EmONC facilities, which means most birth sites were not able to adequately treat obstetric emergencies.
- Despite the government's target of 100 percent treatment of obstetric complications in health facilities, met need for EmONC in 2016 was low (18 percent in all facilities).
- Regionally, met need for EmONC ranged from 3 percent in Gambella to 83 percent in Addis Ababa. Most regions had a met need for EmONC of less than 33 percent.
- The national population-based caesarean delivery rate was 2.7 percent, though there were large regional disparities; cesarean delivery rates ranged from 25 percent in Addis Ababa to less than 1 percent in Afar and Somali. The minimum rate required to meet the expected needs of the population is 5 percent.

- The stillbirth rate in EmONC facilities was very high (39 per 1,000 live births) and very early or pre-discharge neonatal death was three per 1,000 live births.
- Although labour and delivery and safe/postabortion registers were widespread in all facilities, over half of the facilities in all regions were not completing the registers as designed, nor were they up-to-date. This is an opportunity to improve facility record-keeping, especially at the health centre level.

Chapter 4: Additional Obstetric and Newborn Care Indicators for Coverage, Readiness, and Quality

- Provision and readiness to provide the basic EmONC signal functions showed good progress between 2008 and 2016, especially among health centres. The only basic signal function to show a substantial decline in readiness was parenteral antibiotics.
- In 2016 the least provided basic signal function was parenteral anticonvulsants despite 72 percent of facilities reportedly "ready" to provide them; only 26 percent of facilities provided this drug.
- For each EmONC signal function, except for manual removal of placenta and assisted vaginal delivery, readiness was undermined by the gap in drugs (e.g., antibiotics, anticonvulsants) or equipment (e.g., removal of retained products, newborn resuscitation). These patterns varied by type of facility.
- Fewer than 10 percent of health centres provided antenatal corticosteroids, IV fluids to newborns, or administration of oxygen; these 3 EmNeC signal functions were primarily the domain of hospitals.
- Hospitals reported midwives as the key cadre to perform the EmONC signal functions. Emergency surgical officers also played an important role. The same pattern could be seen with the EmNeC signal functions – hospitals leading with midwives, followed by nurses and emergency surgical officers. At health centres, all basic EmONC and EmNeC signal functions were performed primarily by midwives or nurses, when performed.
- Readiness to provide routine delivery services was measured based on infrastructure, respectful maternity care, human resources, infection prevention, availability of drugs, supplies, equipment, and diagnostics. Based on a score of 70, the average facility score was 45.6, with hospitals scoring higher than health centres. Facilities with higher scores tended to serve more women: 38 percent of institutional deliveries took place in the top scoring quartile of facilities.
- The institutional caesarean delivery rate among private-for-profit facilities was 54 percent, i.e., more than half of the babies born in these facilities were abdominal deliveries.
- More than half of all maternal deaths (52 percent) indicated no cause of death in the register, an increase from 10 percent in 2008.
- Sixty percent of all abortions were safe voluntary terminations of pregnancy; 40 percent were incomplete, spontaneous abortions, and 7 percent of these showed serious complications.
- Facilities did a much better job of documenting or providing post-abortion contraception than they did documenting or providing postpartum contraception.

Chapter 5: Performance of Other Maternal and Newborn Health Services, Procedures, and Policy Environment

- Eighty-five percent or more of facilities provided focused antenatal care, postnatal care, family planning, diagnosis and treatment for STIs, and the PMTCT package.
- Only 39 percent of health centres and clinics provided safe abortion services.

- Median length of stay after a normal delivery was 12 hours; at private facilities, it was 6 hours.
- Among public facilities, 62 percent charged fees before receiving general services; but, few charged for delivery services, emergency services, or drugs or supplies. Fewer than half of facilities had a formal fee waiver system in place. Between 2008 and 2016, it appears that cost barriers have been reduced.
- Almost two-thirds of facilities have implemented the MDSR and have a committee in place, but only 39 percent reported implementing perinatal death reviews.
- About one-quarter of facilities provided the opportunity for birth registration on-site (civil registration system).
- Referral/specialized and general hospitals reported more recent problems than other facilities with women having to sleep on the floor, share beds with other women, or deliver on the floor.

Chapter 6: Facility Infrastructure and Communication

- The MOH has constructed a remarkable number of new facilities over the past 8 years, but gaps remain in the number of primary hospitals and rural health centres if Ethiopia is to meet its own standards of facilities to population size.
- Referral hospitals and health centres had only half the number of maternity beds they need when compared to international standards.
- Proportionally, more health centres had at least one mode of communication in 2008 than in 2016 (58 vs. 31 percent), perhaps due to the five-fold increase in the number of health centres.
- Eighty-eight percent of facilities had a source of electricity, 63 percent of which had power from the grid, an improvement since 2008.
- Nationally, 22 percent of facilities reported no water source; more than half of the facilities in Afar had no source of water.
- Nearly all facilities (97 percent) had an HMIS system and compiled monthly reports on maternal and newborn services. Somali region had the lowest percentage of facilities with a data collection system in place.

Chapter 7: Availability of Human Resources

- In health centres/clinics there was a gap between the number of established positions and the actual number of employees for every health worker cadre. The magnitude of the gap varied depending on the standards used and the use of multiple standards (FMHACA, HSDP IV targets, number of established positions) could make planning more difficult.
- The assessment indicated that most obstetric services and procedures were highly dependent on obstetricians/gynaecologists, emergency surgical officers (ESOs), and midwives. For example, ob/gyns, while important providers of emergency care, were less available than were midwives. In most cases and in the short-term pregnant women are dependent upon the midwife for services.
- The HSDP target for midwives and the 6-midwives-to-1000-population ratio have been met, yet there are 4,803 unfilled established positions for midwives.
- Few midwives working in health centres/clinics have received BEmONC training.
- ESOs played key roles in the provision of basic and comprehensive emergency obstetric services.
- Fewer than 5 percent of medical doctors and health officers have received CEmONC training. There were also gaps in the percent of ob/gyns and ESOs who have been trained in CEmONC.

Chapter 8: Interviews with Service Providers

- Very few providers of any cadre had a written copy of their job description, and fewer than half reported a clear reporting structure (clinical or administrative).
- Midwives were much more likely to have received training on critical procedures than nurses or health officers; yet, health officers were often as likely as midwives to report having provided the same procedures recently. Health officers also scored similarly to midwives on most knowledge questions.
- All provider cadres scored substantially better on aspects of routine intrapartum and newborn care than on aspects of care for obstetric or newborn complications.
- A substantial proportion of providers (13 percent) indicated that they would never give a loading dose of magnesium sulphate, including 20 percent of nurses. All cadres scored similarly on perceptions of supervisory support. Out of 100, scores ranged from 65 to 70; a modestly positive result.
- In general, motivation appeared high. Medical doctors appeared to be the most motivated among all cadres, and perceived themselves as well supported (despite the small numbers from which the generalization is made); whereas, health officers, compared to doctors, midwives and nurses, were the least satisfied with their jobs.
- When asked what could be done to improve the quality of the services they provided, the desire for more knowledge, updates, and training was ranked as the top priority by all health worker categories (from among a list of 10 items).

Chapter 9: Availability of Drugs, Equipment, and Supplies

- Almost all health facilities reported having a pharmacy or drug store at the time of the survey.
- Ninety-seven percent of health facilities with a pharmacy or supply of medicines reported that their primary source of medicine was the government.
- Almost all health facilities had one or more antibiotic drugs related to signal functions.
- Overall, 98 percent of health facilities had one or more IV fluids.
- In general, 97 percent of health facilities had one or more contraceptive method. However, only 78 percent of them had emergency contraception.
- The most commonly available guidelines in the maternity area were for: family planning (78 percent of health facilities), 52 percent for obstetric topics and infection prevention, and 48 percent for preterm/low birth weight/KMC guidelines.
- The most widely available basic equipment in the maternity area were stethoscope for adults (98 percent), blood pressure cuff (94 percent), foetal stethoscope (92 percent), and clinical thermometer (92 percent). Meanwhile, a functioning autoclave was only available in 51 percent of health facilities.
- Overall, 98 percent of health facilities had at least 1 complete delivery set. The mean number of availabile delivery sets was 5 per facility. However, only 63 percent of primary hospitals had an ultrasound, and 68 percent of all health facilities had a Sims speculum.
- Among the disinfectants and antiseptics, the most widely found were chlorhexidine solution (Savlon) (84 percent), povidone-iodine (78 percent), and alcohol-based rub (73 percent).
- Ferrous sulphate with folic acid was available in only 78 percent of health facilities; it is essential for all pregnant women.

- Seventeen percent of health facilities with a pharmacy or supply of medicines faced a stock out of oxytocin in the last 3 months, and 21 percent had no refrigerator.

Chapter 10: Case Reviews

- Although use of the partograph increased substantially since 2008 and more partographs showed the initial cervical dilation charted correctly on the alert line, use was suboptimal. More than half (55 percent) of women who received augmentation did not have the timing or the dosage of administration recorded on the partograph, demonstrating a lack of understanding of the importance of monitoring this intervention relative to the action and alert lines.
- Documentation of prophylactic uterotonics was available for only half of the women whose caesarean was reviewed whereas all women should receive them and their use recorded.
- Maternal death reviews suffered from poor record-keeping. Many variables of interest – cause of death being primary – were unavailable in the registers, patient charts and audit files, or the files themselves were not accessible. Missing information was less of a problem when women died in hospital compared to health centres.
- The reviews of the three maternal morbidities indicate a need for better recording and early monitoring of vital signs (temperature, pulse, blood pressure), measurement of fluid input and output, and use of diagnostics to improve diagnosis and provide prompt early treatment.
- A large number of newborns who suffered from breathing difficulties were of normal weight and at term, with unacceptably high mortality in this group. This implies deficient immediate neonatal care and training of care providers at the time of delivery in neonatal resuscitation is indicated.

Chapter 11: Referral System

- Overall, 17 percent of facilities had their own dedicated functioning ambulance (motor vehicle, motorcycle, or tricycle ambulance). Among these, reports of using the ambulance for non-emergency transport were common, for example, immunization campaigns (25 percent of facilities) and to pick up or drop off supplies (23 percent). Use of the ambulance for transporting patients home was reported by 48 percent of facilities.
- District Health Offices provided ambulance services for 62 percent of health facilities overall, and for 64 percent of health centres. However, a third of facilities assumed that patients would find referral transportation on their own.
- The three top indications requiring referral among maternity cases were: prolonged labour or CDP, haemorrhages, and hypertensive disorders. Two-thirds of newborn referral cases consisted of asphyxia/respiratory problems and low birth weight/prematurity.
- Most facilities had a person assigned to take charge of referrals, but 23 percent of facilities had no one person in charge.
- Among facilities with $\geq$ 1 functional ambulances on-site, 26 percent had written guidelines.
- Seventy-three perent or 61,292 women with obstetric complications admitted at health centres were referred out to a higher level of care, suggesting the low functioning capability of health centres and their unrealized potential to manage more complications.

Chapter 12: Maternity Waiting Homes/Rooms

- More than half of facilities (53 percent) had either a stand-alone maternity waiting home (MWH) or a dedicated room within the facility for women waiting for labour to begin. Gambella was the only region with no MWH.
- Occupancy in MWHs was much lower than capacity would allow (only 2 occupants on average when mean capacity was 7).
- Most facilities with a MWH/room provided food (84 percent) and health education (88 percent) to women during their stay. Health promotion and education focused primarily on the risk of delivering at home, breastfeeding, and family planning.
- The most frequently cited barriers to the utilization of MWHs included "no one to care for the children at home or to prepare food" when a woman is absent, and "husbands do not allow."
- Interviews with MWH residents indicated that they spent on average 16 days at the MWH, although 5 percent of those interviewed had never been visited by a health worker and 16 percent hadn't been visited in more than 2 days.

Chapter 13: Woreda, Zonal, and Regional Health Care System Interviews

- Although availability of a liaison officer and referral directory are key elements of ensuring service delivery, only 18 percent of woredas had a liaison officer in every facility and only one in ten woredas had a liaison officer in some facilities.
- Woredas (28 percent) and zones (19 percent) experienced major shortages in assigned quality assurance officers.
- The vast majority of woreda health offices (96 percent), zones (88 percent), and regions (89 percent) had annual plans for human resources for health.
- Nine percent of regions, 2 percent of woredas and less than 1 percent of zones reported that they provided no supervisory activities.
- Nationally, 82, 77, 76 percent of regions, woredas and zones were implementing health care financing reform in all zones/facilities/woredas. However, community-based health insurance was less widespread, having been implemented in 65 percent of zones, 32 percent of woredas, and 30 percent of regions.
- The eHMIS system was in place in 96 percent of woredas, 99 percent of zones and in all regions.
- Only 29 percent of woredas, 38 percent of zones, and 73 percent of regions reported that they had a vital statistics and civil registration system in place.
- Observation of the policy or guidelines for MWHs was low: 18 percent of woredas and regions, and 15 percent of zones.

Chapter 1: Introduction and Background

1.1 Maternal and newborn health profile

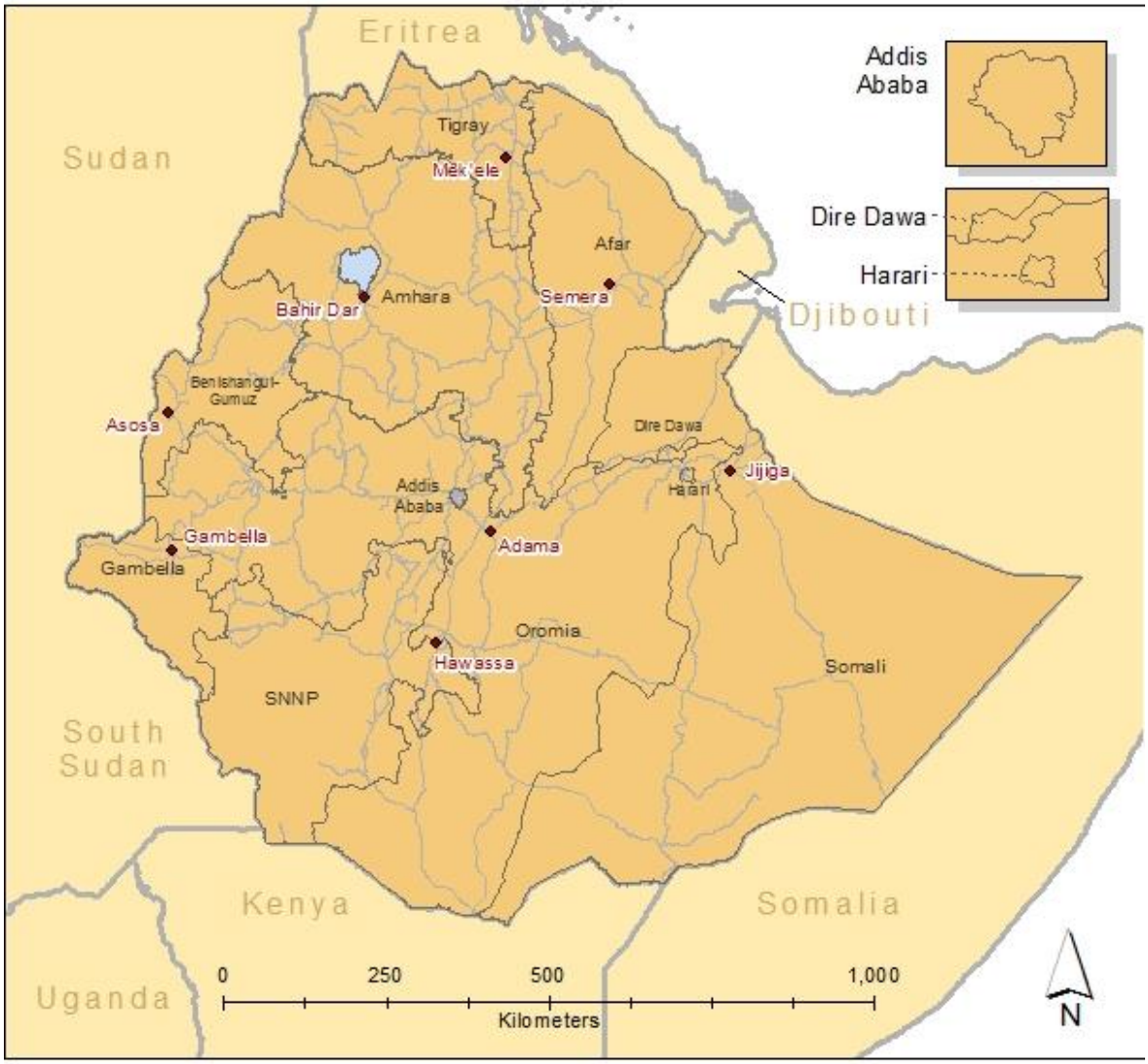
Emergency obstetric and newborn care (EmONC) refers to the care of women and newborns during pregnancy, delivery, and the time after delivery (postpartum period) if or when a woman or her newborn experiences serious complications. The World Health Organization (WHO) estimates up to 15 percent of expected births worldwide develop life-threatening complications during pregnancy, delivery or the postpartum period. Providing emergency care is recognized as an essential and effective component of obstetric services[1,2].

Since 1990 the annual number of maternal deaths has substantially declined. In 2015 an estimated 303,000 women died because of pregnancy and childbirth-related complications. Of these, sub-Saharan Africa (66 percent) and Southern Asia (22 percent) accounted for 88 percent of the global burden[3]. Newborn deaths have also declined but in 2015 there were still 2.7 million neonatal deaths and 2.6 million stillbirths[4,5].

According to United Nations (UN) estimates, Ethiopia has reduced maternal mortality by 72 percent since 1990 with a 5 percent annual rate of reduction[3]. The maternal mortality ratio (MMR) has declined to 353 per 100,000 live births in 2015 from 1,250 in 1990[3]. The Ethiopia Demographic and Health Survey (EDHS) of 2016 reported an MMR of 412 per 100,000 live births[6]. The major causes of maternal death in Ethiopia are haemorrhage, hypertension in pregnancy, obstructed labour, sepsis, and anemia[7].

[1] WHO. Managing newborn problems: a guide for doctors, nurses, and midwives. Geneva: World Health Organization; 2003.
[2] Adam T, Lim SS, Mehta S, Bhutta ZA, Fogstad H, Mathai M, et al. Cost effectiveness analysis of strategies for maternal and neonatal health in developing countries. *BMJ*. 2005;331(7525):1107.
[3] World Health Organization, UNICEF, UNFPA, World Bank Group, United Nations Population Division. Trends in Maternal Mortality: 1990 to 2015. Geneva, Switzerland: 2015.
[4] Blencowe H, Cousens S, Jassir FB, Say L, Chou D, Mathers C, et al. National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis. *Lancet Glob Health*. 2016;4(2):e98-e108.
[5] UN Interagency Group for Child Mortality Estimation. Levels and trends in child mortality: Report 2015. 2015.
[6] Central Statistics Agency, ICF. Ethiopia Demographic and Health Survey 2016: Key Indicators Report. Addis Ababa, Ethiopia and Rockville, Maryland: CSA and ICF, 2016.
[7] Federal Democratic Republic of Ethiopia Ministry of Health (FMOH), Ethiopian Public Health Institute. National maternal death surveillance and response annual report 2008 EFY. Addis Ababa, Ethiopia: FMOH, EPHI, 2017.

Map 1.1.1: Regions, Roads and Cities of Ethiopia



- Major Cities
- Lake Tana
- Primary Road
- Regions

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
*EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

The under-five mortality rate in Ethiopia has declined from 205 to 145 per 1,000 live births between 1990 and 2015. During the same period, neonatal mortality has declined from 61 to 28 per 1,000 live births. In 2015, 87,000 neonatal deaths accounted for 47 percent of all under-five deaths[8]. The primary causes of neonatal mortality are asphyxia, prematurity, sepsis, and congenital abnormalities[9]. A further 97,000 stillbirths were estimated to occur in 2015 in the country[10].

Maternal complications and maternal deaths significantly impact the newborn's ability to survive and thrive. Neonatal outcomes are linked to maternal health and, therefore, to the quality of care a mother receives during pregnancy, delivery, and in the immediate postpartum period[11].

Evidence has shown that poor quality facility-based care is one of the major contributing factors to elevated rates of morbidity and mortality. In addition, women who perceive the quality of facility-based care to be poor, may choose to avoid facility-based deliveries, where life-saving interventions are most likely to be available[12].

1.2 EmONC and EmNeC signal functions and indicators

At the core of EmONC measurement are nine signal functions that are illustrative life-saving procedures for women experiencing major direct obstetric complications. A facility qualifies as ***functionally*** basic EmONC (BEmONC) if the seven basic signal functions have been performed in the three months prior to the assessment. A facility qualifies as ***functionally*** comprehensive EmONC (CEmONC) if caesarean delivery and blood transfusion services are provided **in addition to** the seven basic signal functions[13].

Basic signal functions

- Parenteral (intravenous (IV), intramuscular (IM)) antibiotics
- Parenteral (IV, IM) anticonvulsants
- Parenteral (IV, IM) oxytocics
- Manual removal of placenta
- Removal of retained products, e.g. manual vacuum aspiration (MVA)
- Assisted vaginal delivery (with vacuum extractor or forceps) (AVD)
- Neonatal resuscitation with bag and mask

[8] UN Interagency Group for Child Mortality Estimation. Levels and trends in child mortality: Report 2015. 2015

[9] UNICEF, WHO. A decade of tracking progress for maternal, newborn and child survival: The countdown 2015 report. Washington, D.C.: UNICEF, WHO, 2015.

[10] Blencowe H, Cousens S, Jassir FB, Say L, Chou D, Mathers C, et al. National, regional, and worldwide estimates of stillbirth rates in 2015, with trends from 2000: a systematic analysis. *Lancet Glob Health*. 2016;4(2): e98-e108.

[11] Lawn J. 4 million neonatal deaths: When? Where? Why? *Lancet*. 2005; 365:891-900.

[12] Austin A, Langer A, Salam RA, Lassi ZS, Das JK, Bhutta ZA. Approaches to improve the quality of maternal and newborn health care: an overview of the evidence. *Reprod Health*. 2014;11 Suppl 2: S1.

[13] WHO, UNFPA, UNICEF, AMDD. Monitoring emergency obstetric care: a handbook. Geneva: World Health Organization; 2009.

Comprehensive signal functions

- All seven basic signal functions, PLUS
- Caesarean delivery and
- Blood transfusion[14]

Eight EmONC indicators were developed by WHO, UNICEF, UNFPA, and AMDD for the monitoring and evaluation of the process and progress towards reducing maternal mortality. These indicators are:

- Availability of EmONC: Percent of recommended number of Basic and Comprehensive EmONC facilities, based on a ratio of 5 EmONC facilities for every 500,000 population, where at least 1 of the facilities provides CEmONC
- Geographic distribution of EmONC facilities
- Proportion of all births in EmONC facilities
- Met need for EmONC
- Caesarean section as a proportion of all births
- Direct obstetric case fatality rate
- Intrapartum and very early neonatal death rate
- Proportion of maternal deaths due to indirect causes[14].

The above indicators depend largely on data from routine service records and inform decision makers and program managers about the availability, utilization, and quality of EmONC. With the last indicator, we learn what other services are needed in addition to EmONC.

To complement and supplement the EmONC signal functions, the global community has decided to establish a set of emergency newborn care signal functions, which in this report are called EmNeC signal functions. In consultation with experts with the Every Newborn Action Plan, Saving Newborn Lives, and the London School of Hygiene and Tropical Medicine, seven signal functions were proposed for inclusion in the 2016 Ethiopia EmONC Assessment. Like the EmONC signal functions they are illustrative and align well with the primary causes of newborn deaths. At this time, which signal functions might be appropriate for distinguishing between basic and comprehensive EmNeC has not been decided. The experience in Ethiopia will help inform this process.

The proposed signal functions are:

- Antenatal corticosteroids
- Antibiotics for preterm premature rupture of membranes
- Antibiotics for neonatal infections
- Resuscitation with bag and mask
- Kangaroo mother care
- Administration of oxygen

[14] WHO, UNFPA, UNICEF, AMDD. Monitoring emergency obstetric care: a handbook. Geneva: World Health Organization; 2009.

- Administration of IV fluids

1.3 Survey rationale

Ethiopia conducted its first national EmONC assessment in 2008[15]. The assessment provided baseline information on routine delivery and most aspects of EmONC services. Key findings from that survey revealed that EmONC facilities were in the centre of the country. This has left significant gaps in the eastern, western, and southern parts of the country. The regions falling below the national average of the percent of recommended EmONC facilities were Afar, Amhara, Oromia, Somali, and SNNP. The only region that met the minimum number of recommended EmONC facilities was Harari.

The 2008 national EmONC assessment showed that among women who were estimated to have a major direct obstetric complication, only 6 percent received treatment in the health facilities surveyed (met need for EmONC), and 3 percent received treatment in EmONC facilities. In the three months prior to the survey, among all hospitals visited (n=109), 78 percent performed caesareans and only 64 percent provided blood transfusion, although all hospitals are expected to provide these services. Both the institutional delivery rate and the caesarean delivery rate were unacceptably low in rural areas, indicating regional disparities in access to and quality of existing services.

The findings of the 2008 EmONC assessment have been used to guide policies in planning and prioritization of interventions that strengthen the health system. The government of Ethiopia has shown considerable commitment to improving the quality of care, service availability, and readiness of the country's health facilities in its road map for accelerating the reduction of maternal and newborn mortality and morbidity in Ethiopia (2011-2015)[16].

The Health Sector Transformation Plan (HSTP) is the current five-year national health sector strategic plan, which covers July 2015 to June 2020. Based on a performance evaluation of the Health Sector Development Program (HSDP) that preceded it, the number of health centres and hospitals providing basic and comprehensive emergency obstetric and newborn care has increased since the 2008 national EmONC assessment[17].

According to the 2014 Ethiopia Service Provision Assessment (SPA) Plus Survey report, nearly 65 percent of all facilities, excluding health posts, offer normal delivery service. Almost all (99 percent) government managed facilities offer routine delivery services while only 27 percent of private-for-profit facilities and 69 percent of nongovernment organization (NGO) facilities provide this service. However, only 3 percent of facilities, predominantly hospitals, provided caesarean delivery services. Moreover, government

[15] Federal Ministry of Health of Ethiopia, UNICEF, UNFPA, WHO, AMDD. National Baseline Assessment for Emergency Obstetric & Newborn Care Ethiopia 2008. Addis Ababa, Ethiopia: 2009.

[16] Federal Ministry of Health of Ethiopia. Road map for accelerating the reduction of maternal and newborn mortality and morbidity in Ethiopia: 2011-2015. Addis Ababa, Ethiopia: FMOH, 2011.

[17] Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). Health Sector Transformation Plan: 2015/16 - 2019/20. Addis Ababa, Ethiopia: FMOH, 2015.

facilities offering routine delivery services are more likely to perform BEmONC signal functions than private facilities[18].

As indicated in the HSTP, the goals concerning EmONC are:

1) increase met need for EmONC to 100 percent;
2) increase the percentage of health centres providing BEmONC from 56 percent to 100 percent;
3) increase the percentage of hospitals providing CEmONC from 83 percent to 100 percent;
4) reduce the MMR from 420 to 199; and
5) reduce the neonatal mortality rate from 28 per 1,000 live births to 10 by 2020.

Therefore, a follow-on national EmONC assessment was designed and implemented to enable the government to update important indicators and measure the progress of many efforts put in place since 2008. It will also provide a platform for identifying current gaps that will require implementation of further interventions and allow for action planning at regional, woreda, and facility level.

The release of WHO's *Standards for improving quality of maternal and newborn care in health facilities* in 2016 offers a new and additional lens through which to assess the current state of Ethiopia's EmONC services[19]. Periodic national EmONC assessments are essential to monitoring progress towards achieving the availability, accessibility, utilization and quality of routine and emergency care that all mothers and children have the right to receive.

1.4 Objectives of the assessment

General objective

To generate evidence on the current availability, utilization, and quality of EmONC and routine delivery services in Ethiopia.

Specific objectives

- ✓ To measure the availability of infrastructure, equipment, essential drugs, and supplies in health facilities;
- ✓ To assess a range of practices related to fees for obstetric services;
- ✓ To determine the availability knowledge and competency of human resources;
- ✓ To review cases of caesarean deliveries, maternal deaths, women with major obstetric complications, partographs, and newborn complications;
- ✓ To map EmONC services as part of Service Availability Mapping;
- ✓ To determine the status of EmONC services, implementation of the MDSR system and utilization of life-saving procedures;

[18] Ethiopian Public Health Institute. Service provision assessment plus survey of Ethiopia: 2014. Addis Ababa, Ethiopia: EPHI, 2014.

[19] World Health Organization. Standards for Improving Quality of Maternal and Newborn Care in Health Facilities. Geneva, Switzerland: WHO, 2016.

- ✓ To assess the availability and use of records for EmONC services and the completeness of EmONC data; and
- ✓ To assess the availability and functioning of maternity waiting homes and the referral system.

1.5 Outcomes of the assessment

At national level

The primary outcome of the EmONC assessment is to generate evidence that enables the Ministry of Health to fill gaps of EmONC service provision and inform planning for maternal and newborn health (MNH) programs. The assessment reveals health facilities' information on the status of EmONC indicators, performance of MNH services, infrastructure, human resources, drugs, equipment, and supplies, and focused case reviews.

The EmONC assessment findings will be triangulated with other contemporary maternal and newborn health data from the Health Management Information System (HMIS), EDHS, Service Availability and Readiness Assessment (SARA), SPA, Maternal Perinatal Death Surveillance and Response (MPDSR) and other relevant sources of data. This pooled information will be used by the MOH and other related ministerial sectors to prepare evidence-based plans to improve the quality and equity of EmONC services provision.

These national level plans will further guide the planning process at subnational levels based on the distribution map of EmONC services. In addition, the EmONC status and its progress will be measured and compared to the 2008 EmONC assessment findings.

At regional level

Data from this EmONC assessment will be analysed to provide region-specific information for planning and implementation at subnational levels. The data can be further analysed to produce fact sheets at Woreda level and facility level for action planning. Data can also be used for annual Regional and Woreda-based planning as well as the monitoring and evaluation of Performance Based Contracting. Findings from the assessment will help narrow the woreda level information gap and improve evidence-based local planning.

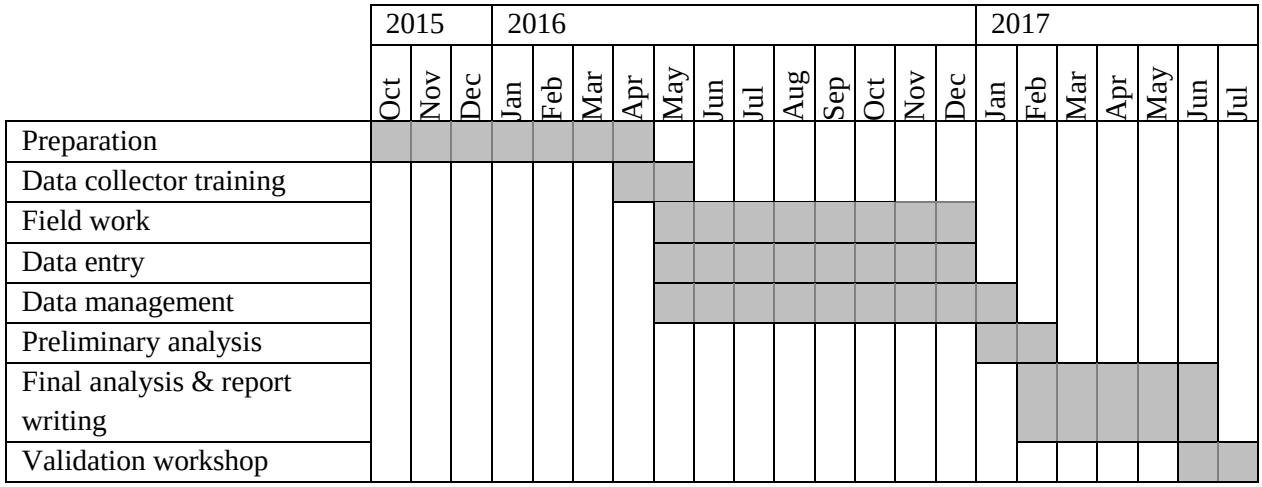
Chapter 2: Methodology

2.1 Organization of the survey

In late 2015 the Ministry of Health and EPHI established a Technical Working Group (TWG) to provide input and guidance for the assessment process. The TWG was composed of individuals from the Maternal Health and Newborn Directorate of the MOH, the Health Systems and Reproductive Health Directorate at EPHI, the national Midwives Association, UNICEF, UNFPA, WHO, Jhpiego, and JSI. The TWG met regularly at first and subsequently when needed. The Averting Maternal Death and Disability (AMDD) program at Columbia University also provided guidance to the assessment and was present for several of the TWG meetings. The day to day execution and implementation of the assessment was the responsibility of EPHI.

An overview of the timeline of activities can be seen below.

Timeline of Activities



2.2 Study design and selection of facilities, respondents, and cases for review

The EmONC assessment was a national cross-sectional census of health facilities, both public and private, that provided maternal and newborn health services.

Facility selection

All eligible public hospitals (referral, general, primary), health centres and all eligible private (for-profit and not-for-profit) facilities (hospitals, MCH Specialty Centres, MCH Specialty Clinics, and Higher Clinics) were included in the study. Eligibility was determined by three characteristics: 1) health facilities classified as higher clinic or above as per the Food, Medicine and Health Care Administration and Control Authority of Ethiopia (FMHACA) definitions because medium clinics and below are not supposed to attend deliveries; 2) the facility reported having attended births in the last 12 months; and 3) the facility was

deemed functional, i.e. the facility was not under construction and was at least minimally operational. The survey included 4,385 facilities in all nine regions and two city administrations.

Based on information from the FMHACA, Regional Health Bureaus, and the Central Statistical Agency (CSA) and findings of the 2014 Ethiopia SPA+ census, a master facility list was created. Survey teams also visited District Health Offices to verify the existence of the facilities on the list. During deployment, teams identified new facilities not yet on the list and these were added after contacting the central level data managers who gave them a unique identification number. To validate that some facilities no longer existed, the Woreda Health Office gave the team a confirmatory letter. The data management team removed all duplicates on the list. Two additional categories of facilities were removed – 11 facilities were not accessible due to unrest and at two facilities staff refused to allow the team to administer the questionnaires. Table 2.1 shows the process of attrition from the master facility list to the final database.

Table 2.1: Numeric distribution of universe of facilities visited and attrition process, by region, Ethiopia EmONC, 2016

	Facilities on MOH master list	Facilities identified during field work (not on list)	Total potential facilities to be surveyed	Facilities found to be non-functional	Facilities were duplicates, closed, non-existent, demoted to health posts, etc.	Medium clinics and "other" clinics	Facilities with no deliveries	Facilities to be surveyed but were not[1]	Facilities refused to participate[2]	Final database
National	4,249	338	4,587	258	202	167	143	11	2	3,804
Region										
Tigray	293	23	316	2	11	16	31	0	1	255
Afar	85	11	96	2	12	0	15	0	0	77
Amhara	1,021	39	1,060	46	98	26	14	0	0	876
Oromia	1,423	115	1,538	78	23	25	7	0	0	1,405
Somali	196	42	238	51	6	6	14	0	0	161
B-Gumuz	46	7	53	7	0	2	1	0	0	43
SNNP	811	40	851	21	27	10	10	10	0	773
Gambella	35	1	36	2	3	0	3	1	0	27
Harari	12	11	23	1	1	4	2	0	0	15
A Ababa	298	44	342	47	31	76	36	0	1	151
D Dawa	29	5	34	1	0	2	10	0	0	21

[1] Facilities not visited due to unrest in Konso and Gambella.

[2] Refusals from facilities on MOH list and among facilities added in the field based on result of last visit.

The final database of 3,804 facilities is described in Table 2.2 that shows the distribution of type of facility in every region and by type of managing authority.

Table 2.2: Number of facilities by facility type, region, and managing authority, Ethiopia EmONC, 2016

	Facility type							
	Referral/ specialized hospital	General hospital	Primary hospital	MCH specialty centre	Health centre	MCH specialty clinic	Higher clinic	Total
National	30	103	160	23	3,459	16	13	3,804
Region								
Tigray	3	16	20	1	213	2	0	255
Afar	0	1	5	1	70	0	0	77
Amhara	5	10	41	2	814	2	2	876
Oromia	7	25	41	4	1,324	2	2	1,405
Somali	0	6	4	0	147	0	4	161
Benishangul-Gumuz	0	2	1	0	40	0	0	43
SNNP	4	13	43	0	709	2	2	773
Gambella	0	1	0	0	26	0	0	27
Harari	1	5	0	1	8	0	0	15
Addis Ababa	9	21	3	14	93	8	3	151
Dire Dawa	1	3	2	0	15	0	0	21
Managing authority								
Government/public	29	63	143	1	3,424	0	2	3,662
Private-for-profit	1	33	13	14	1	12	9	83
Private-not-for-profit	0	7	4	8	34	4	2	59

Respondent selection

For Module 6A: Provider Knowledge for Maternal and Newborn Care and Module 6B: Health Provider Supervisory Support and Motivation, a single respondent was selected based on the following criteria:

- Provider who had attended the largest number of deliveries in the last month or last two months, if no births were delivered in the past month
- Physical presence at the time that the data collection team visited the facility

All selected providers were asked for their consent to participate. If they refused, no other provider was selected from that facility. Technically, this selection strategy produced a convenience sample.

Module 12: Maternity Waiting Homes or Rooms included a series of questions posed to two women staying at the maternity waiting home (MWH) or waiting room. If two or fewer women were staying at the MWH or room when the data collection team arrived, both women were asked to participate as a respondent. If more than two were present, data collectors were instructed to choose the two who had been there the longest. Women who were still pregnant and waiting to deliver as well as women who had already delivered

but were resting before they returned home were eligible. However, regarding postpartum women, only those women who had stayed there prior to delivery were eligible.

The respondents for the Health Care System Modules were the heads of the health bureaus or the focal persons for maternal and child health at the woreda, zonal, or regional level, as appropriate. Generally, the interviews also required input from other experts at the health bureaus in areas such as human resources for health, drugs, and supplies, health management information system (HMIS), and financing.

Case review selection

Five modules required the data collectors to make some choices about what cases to review: Module 7: Partograph Review, Module 8: Caesarean Delivery Review, Module 9A: Case Reviews of Women who Survived Obstetric Complications, Module 9B: Maternal Death Review, and Module 10: Chart Reviews of Newborn Complications. In each case, the data collectors were instructed to select up to two cases. The instructions for the partograph review were to choose two partographs completed in the last 12 months by different providers (if possible). Additional selection criteria included that the deliveries took place at the facility, the pregnancies were at term, < 8 cm dilatation, vertex presentation, foetal heart beat present at first exam, and without obstetric complications. The two caesareans were the last two performed in the previous 12 months on women who had been discharged (or who had died) by the time of the visit. Similarly, the maternal death reviews were the last two deaths in the previous 12 months. The newborn morbidity cases included two cases each of newborns with breathing difficulties at birth, preterm babies <2,000 grams, and young infants (<60 days) with infections. Maternal morbidities included two cases each of postpartum haemorrhage, severe pre-eclampsia or eclampsia, and peripartum infections. For all morbidity cases data collectors were to choose the last two cases in the previous 12 months. No woman or newborn was reviewed twice, for example, if the newborn had sepsis and breathing difficulties, information on only one condition was included.

The samples of providers, residents at the MWHs, partographs, caesareans, maternal deaths, and maternal and newborn complications are convenience samples; no attempt to choose a random sample was made. For this reason, inferences based on these samples should not be applied to the larger population.

2.3 Data collection instruments and pre-testing

In early 2016 the EPHI team held a workshop for the TWG to adapt the 2008 modules and a set of tools revised by AMDD in 2014. The tools were revised and adapted to the local context. The health system modules were an entirely new concept and designed locally. Ethiopia was also the first country to test the maternity waiting home or room module, the self-administered provider module, and the morbidity case reviews. EPHI developed an electronic data collection template using CSPro 6.1.

The EmONC assessment utilized 14 facility-based modules or data collection instruments plus modules for each woreda, zone, region, and one national module.

The following modules were used for the assessment:

- **Module 1: Identification of Facility and Infrastructure** required taking the facility's GPS coordinates, photographing the facility, interviewing a person of authority at the facility, and recording background information on the facility - including size or capacity, overall infrastructure, summary of services provided, cost of services, policies in place at the facility, and HMIS reporting.
- **Module 2: Human Resources** involved interviewing one or more persons with excellent knowledge of the staffing patterns of health care workers providing obstetric and newborn care at the facility and which signal functions and essential services the staff provide. It also covered the staffing situation 24 hours 7 days a week in that facility.
- **Module 3: Essential Drugs, Equipment, and Supplies** examined the availability of medications, equipment, and supplies; laboratory services; and clinical management guidelines and protocols necessary for the delivery of EmONC and routine maternal and newborn services. This module was conducted primarily by interview and observation.
- **Module 4: Facility Case Summary** was used to collect the necessary data from facility registers and records to calculate the EmONC Indicators; these data included the number of deliveries, obstetric complications, caesarean deliveries, maternal deaths, stillbirths, and pre-discharge early neonatal deaths. The 12-month time-period covered the 2015 Gregorian calendar (January – December).
- **Module 5: EmONC and EmNeC Signal Functions and Other Essential Services** looked at how facilities *actually* function and whether they offer all, some, or none of the services necessary to treat and save newborns and women with obstetric complications. It also looked at why these services were not available. Performance information was determined through interview and validation from the registers. This module used a different reference period from Module 4. Instead of the 2015 calendar year, it referred to the three months prior to the survey visit, a rolling three-month period between February and December, 2016. Thus, the two-time periods did not overlap.
- **Module 6A: Provider Knowledge for Maternal and Newborn Care** was used to interview providers to assess their knowledge and self-reported practice of the diagnosis and management of common maternal and newborn conditions; it also reviewed specific training for and performance of key services.
- **Module 6B: Health Provider Supervisory Support and Motivation** was a self-administered module that assessed the provider's motivation and attitudes about her or his work environment, opportunities, and supervision.
- **Module 7: Partograph Review** was used to determine how many facilities used the partograph and to assess the completion of the partograph and to the extent possible, the quality of case management. This module was conducted by interview and record review.
- **Module 8: Caesarean Delivery Review** was used to review facility registers and records to evaluate record-keeping for caesareans, indications for c-sections, foetal well-being, and maternal outcome of the procedure.

- **Module 9A: Case Reviews of Women who Survived Obstetric Complications** was designed to elicit information on how women with major obstetric complications were managed, two cases each of the following complications: postpartum haemorrhage, severe pre-eclampsia or eclampsia, and peripartum infections. Information was gathered through chart reviews and included client history, status on admission, antecedents and treatment, and newborn outcomes.
- **Module 9B: Maternal Death Review** was designed to collect detailed information on the last two women who died from direct or indirect obstetric complications in health facilities as well as information on contributory factors associated with maternal deaths. Data collectors pulled information from charts identified through the registries or from staff.
- **Module 10: Chart Reviews of Newborn Complications** was designed to collect information on two cases each of the following morbidities: difficulties breathing at birth, preterm birth <2,000 grams, and infections among young infants (<60 days). The module asked about the status on admission and treatment. Data collectors pulled information from charts identified through the registries or from staff.
- **Module 11: Referral for Obstetric and Newborn Clients** assessed the availability of services for emergencies, indications or reasons for referral, transportation, communication, management and policies for referral out and in. This module was conducted by interview.
- **Module 12: Maternity Waiting Homes** included information on the existence and status of maternity waiting homes (MWH) or rooms at health facilities. It also included a brief set of questions targeted at women who were staying at the MWH at the time of the visit. This module was conducted by interview.
- **4 Health Care System Modules** were designed to collect information on the six WHO building blocks for health system strengthening. Interviews were conducted at Woreda Health Offices, Zonal or Sub-city Health Offices, and Regional Health Bureaus. A National level module was also completed by the EPHI team to gather information about human resource training and norms, and policies.

Three rounds of pretesting took place to detect problems in the flow of the questions, gauge the length of time required for interviews, and identify problems in the understanding of terms and concepts. The pretest was critical for detecting problems with the electronic data entry program. The pretesting took place before the training of trainers, during the training of trainers, and the first data collectors' training session. After the pretesting, the technical team corrected inconsistencies and other issues identified.

2.4 Recruitment, training, and deployment of data collectors, team leaders, and coordinators

EPHI recruited individuals with either a bachelor's or master's level education and a health background to serve as field staff. Those who were hired came from a variety of health professions, including health officers, environmental and laboratory technical persons, midwives and nurses, and others. Some had prior experience as data collectors and had Master's degrees in Public Health (MPH). The final staff breakdown for the assessment included four central coordinators (two survey coordinators and two data managers), 13 regional coordinators, and 186 data collectors (plus eight alternates), 62 of whom served as team leaders. Recruitment criteria for the team leaders were more stringent than for the other data collectors.

AMDD senior technical staff led a training of trainers (ToT) in the city of Adama on 4-9 April 2016, attended by 22 representatives from EPHI (including the survey coordinators and data managers mentioned above), MOH, and other development partners (UNICEF, Jhpiego, JSI, and the Ethiopian Midwives Association). The training consisted of in-classroom informative and participatory training as well as a field activity.

The trainers conducted two rounds of trainings for data collectors and regional coordinators. The first round of data collector training (DCT) took place in the city of Hawassa on 18-28 April 2016, attended by 111 data collectors (plus five alternates) and ten regional coordinators. The second round of DCT took place in the city of Adama on 10-19 May 2016, attended by 75 data collectors (plus three alternates) and three regional coordinators. Groups of three or four trainers led concurrent sessions of approximately 30 trainees each during both DCT rounds.

DCTs consisted of instruction on interviewing techniques and field procedures, a detailed review of the questionnaire content and instructions, mock interviews between participants in the classroom, and practice with both CAPI (computer-assisted personal interviewing) and CAFE (computer-assisted field entry) capture with the 17 questionnaires. A two-day field activity at nearby health facilities provided trainees an opportunity to practice data collection in the field. Team leaders and regional coordinators received additional training in data quality control procedures and fieldwork coordination.

Once trained, the data collectors were divided into 62 teams of three, with one member per group serving as a team leader. Round one and round two teams were deployed in the second and last week of May 2016, respectively. The eight alternate data collectors each accompanied a data collection team during fieldwork to ensure they remained familiar with data collection procedures. The 13 regional coordinators were deployed on the same schedule as the data collectors.

2.5 Organization of data collection (field work)

EPHI and the Ministry of Health issued a letter to all the Regional Health Bureaus requesting their support in the national EmONC assessment. Regional Health Bureaus subsequently wrote supporting letters to their lower level Zonal and Woreda Health Offices to ensure that the data collection ran smoothly.

EPHI organized the field work, including the hiring and payment of workers; logistics and transportation; determining team itineraries; communication with the Regional Health Bureaus to ensure they were well informed and could facilitate when their help was needed; monitoring the data transfer system; and carrying out extensive supervision over the duration of the field work. The regional coordinators were also engaged in supervision and problem solving whenever the teams faced challenges from Woreda Health Offices or facilities. In addition to the supervision provided by the regional coordinators, the EPHI team, AMDD, and the TWG provided field supervision and spot checking in many of the regions, including the accuracy of GPS readings. There were several TWG meetings at the EPHI office to update the TWG on the progress of data collection and to jointly solve problems (e.g. data collection problems due to the protracted unrest in Amhara and Oromia regions). The Ministry of Health was involved from the beginning of the EmONC assessment and helped the coordination team through consultations on the process to ensure smooth completion of the data collection.

The field work began in mid-May and ended in mid-December 2016. When a team concluded its work early and a neighbouring region had not yet finished, this team was deployed to help finish the larger regions. To limit field work in the rainy season, teams began in the farthest points and worked increasingly towards Addis.

2.6 Data entry, cleaning, and analysis

The responsibility of data entry, cleaning, and analysis belonged to the Health System Research Directorate of EPHI.

Modules 4, 6A, 6B, 7, 8, 9A, 9B, and 10 were paper-based, followed by performing data entry later in the day in the field. This process was called CAFE (computer-assisted field editing) and each team had one tablet. The remaining modules were administered directly using a tablet, called the CAPI (computer-assisted personal interviewing) mode. The entered data were checked by the team leader on the team's tablet and were made accessible to the regional coordinator and the central survey coordinators when there was an internet connection. The regional coordinator checked for completeness, consistency, and errors. After this review, the teams sent the data to the EPHI Central Office. Coordinators urged the teams to send the data soon after the completion of a facility visit before the team departed for other facilities. However, because of difficulties accessing the internet, the teams sent data as soon as was possible.

The data were sent to the Central Office using the Internet File Streaming System (IFSS). These files were extracted, reviewed, and checked for errors and inconsistencies. Secondary editing was done by two data managers located at EPHI and if errors or inconsistencies were found, teams were asked to correct and resend the data. The data managers finalized the process by backing up the data on the EPHI server with password protection. The data were secured and were not accessible to unauthorized persons.

Double-data entry was completed for Module 4, Facility Case Summary. Data cleaning included range checking, data structure, and a selected set of checks for internal consistency. All errors detected during machine editing were corrected. Prior to analysis, further steps were taken to ensure unique identification numbers, validation of location of health facility, and the recoding of "other" responses.

All data management was done using CSPro 6.1 programming. The data were exported to SPSS and STATA for analysis. ArcGIS ArcMap 10.4.1 software was used to create maps. Prior to the completion of data collection, EPHI and AMDD conducted a workshop to develop table shells and discuss preparations for analysis and report writing. Once completed, the draft tables were discussed with the TWG. This led to a workshop to populate and revise the draft tables, identify additional tables, and initiate the writing of the report text.

The data are owned by the government of Ethiopia through EPHI.

Stratification variables

Four common stratification variables were used throughout this report:

- *Region* consisted of the 11 administrative units established by the government, two of which are city administrations (Addis Ababa and Dire Dawa).
- *Facility type* was collected originally in eight categories: referral or specialized hospital, general hospital, primary hospital, health centre, MCH specialized centre, MCH specialized clinic, higher clinic and "other." The "other" group was examined closely and when appropriate a facility was recoded into one of the other seven categories, but most of the "others" did not provide MCH services. For most of the analyses we maintained the first seven categories, but for some tables the seven categories were collapsed into two: 1) referral or specialized, general, and primary hospitals and MCH specialized centres, and 2) health centres, MCH specialized clinics, and higher clinics.
- *Managing authority* was defined by four categories: government or public; NGO or not-for-profit; private-for-profit; and mission or faith-based. However, for most tables these four categories were collapsed into three: 1) public or government, 2) private-for-profit, and 3) private not-for-profit (including NGO, mission, or faith-based).
- *Urban or rural* classification was determined by the respondent of Module 1: Identification of Facility and Infrastructure.

2.7 Quality assurance

Quality assurance involved multiple steps along a continuum of training, data collection in the field, and data processing at central level, especially during the first weeks of data collection, with experienced trainers accompanying the teams to mentor and help problem solve as early as possible.

Quality assurance began with the recruitment of data collectors and team leaders with a health background. Data collectors took pre- and post-tests to assess their learning and knowledge of the assessment guidelines and standards for data collection. Each data collector was given a hard copy manual of the assessment guidelines and they had soft copies of their instruction manuals on their tablet.

Team leaders played a critical role in the correct completion of the modules as they reviewed all the questionnaires. The regional coordinators visited and communicated with teams regularly to provide support and help when difficulties arose at individual facilities. The central coordinators at EPHI, AMDD, and members of the TWG supervised the teams in the field to ensure consistency and quality. When needed, the central data managers telephoned facilities for clarification and to ensure quality.

2.8 Response rates

Table 2.3 describes the results of the data collection in terms of how many facilities responded to each module. For modules 1 through 6B, 11 and 12, one module per facility was expected. The response rate was 100 percent except for Module 6A where four facilities failed to participate (response rate 99 percent) and it was higher for 6B. More than 3,800 providers completed the self-administered questionnaire but given the concern for confidentiality, no facility identification was included on the questionnaire that would have permitted us to select only those facilities included in the final database. As for the case reviews, the maximum per facility for Modules 7, 8, and 9B was two cases. For Modules 9A and 10, the maximum was six cases (two each of three complications). However, completion of case reviews was dependent on the occurrence of cases and the ability to locate additional source information for each case.

Table 2.3: Modular response, Ethiopia EmONC, 2016

Administered modules		Number of facilities with responses
Module 1	Identification of Facility and Infrastructure	3,804
Module 2	Human Resources	3,804
Module 3	Essential Drugs, Equipment, and Supplies	3,804
Module 4	Facility Case Summary	3,804
Module 5	EmONC and EmNeC Signal Functions and Other Essential Services	3,804
Module 6A	Provider Knowledge for Maternal and Newborn Care	3,800
Module 6B	Health Provider Supervisory Support and Motivation	3,823
Module 11	Referral for Obstetric and Newborn Clients	3,804
Module 12	Maternity Waiting Homes	3,804
		Number of cases reviewed
Module 7	Partograph Review	5,252
Module 8	Caesarean Delivery Review	568
Module 9A	Case Reviews of Women who Survived Obstetric Complications	
	Postpartum Haemorrhage	1,497
	Pre-eclampsia, eclampsia	959
	Sepsis	384
Module 9B	Maternal Death Review	609
Module 10	Chart Reviews of Newborn Complications	
	Breathing difficulties	2,433
	Preterm, low birth weight babies	1,144
	Young infants (<60 days) with infections	2,258
Module 12	Women interviewed at the Maternity Waiting Home	993
Woreda	Woreda health offices	821
Zone	Zonal health offices	72
Region	Regional health bureaus	11

2.9 Research ethics

During the DCTs, the trainers introduced the data collectors to principles of confidentiality and ethics in data collection. No person's name (except that of the team leader and regional coordinator) was recorded on any of the modules. Permission to enter each facility, to interview the different employees, and to review registers was requested from the person in-charge at the beginning of each visit. The response from the medical director, matron and all other respondents with whom the team had contact was always respected. The teams carried with them official letters of cooperation from the Regional Health Bureaus and the Woreda Health Offices. Providers who were interviewed for Module 6A granted oral consent prior to the interview itself, and this oral consent was recorded in the module. The same provider was asked for a second consent prior to filling in Module 6B. To further protect the provider's privacy, the completed Module 6B was placed in a separate envelope sealed by the provider. This questionnaire was entered into an entirely different database and cannot be traced to a particular health facility. However, it can be analysed by region, type of facility, and managing authority.

Finally, a letter of ethical approval was granted by the Scientific and Ethical Review Office of EPHI. All concerns and recommendations that the office raised were addressed and incorporated in the final protocol.

2.10 Operational challenges of the survey

Worldwide, in high income countries as well as low and middle income countries, the reporting of maternal deaths is fraught with difficulties. Facility records are often incomplete. Misclassification of cause of death can occur in several ways: a death can be reported incorrectly as direct instead of an indirect cause of death or vice versa; a death can be reported as a maternal death rather than a death to a woman of reproductive age when the cause was unrelated to pregnancy (often called an accidental or incidental death)[20], and maternal deaths can be purposefully misclassified if health workers are fearful of punitive measures. Furthermore, the cause of death may remain unknown when autopsies are infrequent; and not infrequently such reports are omitted. Indirect deaths in EmONC assessments are known to be especially difficult to identify because they rarely occur in the maternity or gynaecology wards. For example, the pregnancy status of a woman who dies of hepatitis on a non-maternity ward may not be displayed in the logbook or register.

Complications are also frequently under-recorded and therefore "Met Need for EmONC" may be underestimated; under-recording of complications (and deaths) will also impact the direct obstetric case fatality rate.

Misclassification of stillbirths and early neonatal deaths may have occurred if staff lack the training to stimulate newborns with difficulties breathing or are motivated for different reasons to call an early newborn death a stillbirth.

Observation of equipment, supplies, and drugs was encouraged but not mandatory given their number. The mandatory observations were few, for example, the type of drug inventory system, the refrigeration of oxytocin, and whether liquid spills or trash could be seen on the floor.

Although designed as a census of hospitals and health centres, a small number of health centres in SNNPR (e.g. Konso) and Gambella were closed because of unrest.

The uneven or irregular access to the internet proved to make rapid turn-around between the field and the regional coordinator or between the field and central level at EPHI difficult and slowed down the feedback process designed to ensure the quality of data collection and entry.

[20] World Health Organization, UNICEF, UNFPA, World Bank Group, United Nations Population Division. Trends in Maternal Mortality: 1990 to 2015. Geneva, Switzerland: 2015.

2.11 Organization of the report

Chapters 3 – 13 cover the results of the survey; they are organized, to a great degree, as per the different modules administered by the data collectors. Key findings for each chapter are presented at the beginning of each chapter in a box. Chapter 14 collects specific recommendations organized around the themes of coverage, infrastructure, human resources, drugs/equipment/supplies, quality of care, and referral and maternity waiting homes.

Because of the large number of tables in every chapter, many tables are annexed at the end of the report in Appendix A. Tables are numbered sequentially where the first number (to the left of the decimal place) refers to the chapter number. Table numbers that end with the letter 'A' mean that they are found in Appendix A. For example, Table 3.1.1A will be found in Appendix A, while Table 3.1.2 would be found in the body of the report.

Health centres and clinics are grouped together and labelled either as 'health centres' or 'health centres/clinics'. It should be understood that if the label reads 'health centres' the clinics are also included. Similarly, sometimes hospitals are grouped with MCH specialty centres since they are all expected to provide comprehensive emergency obstetric care.

Chapter 3: Emergency Obstetric and Newborn Care Indicators in Ethiopia

Key Findings

- Even though substantial changes in the availability of functioning EmONC health facilities have occurred since 2008 (from 11 to 40 percent of the UN recommended minimum), a gap of 60 percent remains. The gap is much larger for BEmONC facilities than it is for CEmONC facilities.
- The institutional delivery rate was 66 percent in 2016, indicating one third of deliveries continue to be at home. Only 14 percent of expected deliveries took place in EmONC facilities, which means most facilities were not ready to adequately treat obstetric emergencies.
- Despite the government's target of 100 percent treatment of obstetric complications in health facilities, met need for EmONC in 2016 was low (18 percent in all facilities and 9 percent in EmONC facilities).
- Met need for EmONC in all health facilities was below 50 percent in all regions (even as low as 3 percent in Gambella, followed by Somali and Dire Dawa); the exceptions were Addis Ababa (83 percent) and Harari (68 percent).
- The national population-based caesarean delivery rate was found to be 2.7 percent in 2016, masking large regional disparities between a 25 percent rate in Addis Ababa and less than 1 percent in Afar and Somali.
- The stillbirth rate in EmONC facilities was high (39 per 1,000 live births) and very early or pre-discharge neonatal death was 3 per 1,000 live births.
- Although labour and delivery and safe/postabortion registers were widespread in all facilities, over half of the facilities in all regions were not completing the registers as designed, nor were they up-to-date. This is an opportunity to improve facility record-keeping, especially at the health centre level.

EmONC refers to a set of life-saving interventions or signal functions used to treat the direct obstetric complications that make up approximately 70-80% of maternal deaths globally[21,22]. A facility qualifies as ***functionally*** basic EmONC if seven signal functions (including one of the seven newborn signal functions - newborn resuscitation) have been performed in the 3 months prior to the assessment[22]. A facility qualifies as ***functionally*** comprehensive EmONC if caesarean delivery and blood transfusion services have been provided in addition to the seven basic signal functions.

The EmONC indicators, as described in the Introduction and Background section of Chapter 1, assess the strength of the health system to deliver life-saving interventions to both mothers and their babies. They

[21] Austin A, Langer A, Salam RA, Lassi ZS, Das JK, Bhutta ZA. Approaches to improve the quality of maternal and newborn health care: an overview of the evidence. *Reprod Health* 2014, 11 Suppl 2:S1.

[22] WHO, UNFPA, UNICEF, AMDD. Monitoring emergency obstetric care: a handbook. Geneva: World Health Organization; 2009.

measure the availability and utilization of services, and the quality of care. They should be used together as a set for action planning and health system strengthening. In addition to the eight key EmONC indicators, other related indicators are also presented in this chapter.

The EmONC indicators answer the following questions:

1. Are there enough facilities providing emergency obstetric and newborn care for the size of the population?
2. Is the distribution of these facilities equitable?
3. Are pregnant women accessing these facilities for delivery?
4. Are the pregnant women most in need, those with major obstetric complications, accessing these facilities?
5. Are enough critical services (e.g. caesarean delivery) being provided?
6. Is the quality of EmONC services adequate?
7. What services are needed in addition to EmONC?

The service statistics (number of deliveries, women with obstetric complications, caesarean deliveries, maternal deaths, stillbirths and newborn deaths) used to calculate the indicators were based on the Gregorian Calendar January – December 2015. The data used to determine whether a signal function was performed were based on the immediate 3 months[23] prior to the facility visit.

3.1 Indicator 1: Availability of EmONC Services

Based on the international definition of signal function performance mentioned above, a total of 370 facilities were determined to be fully functioning EmONC facilities in the country (185 hospitals or MCH speciality centres and 185 health centres, MCH speciality clinics and higher clinics) (Table 3.1.1A on page 317 in the Appendix and 3.1.2). The availability of EmONC facilities (sum of CEmONC and BEmONC) varies across regions with the lowest in Gambella (4 percent) to the highest in Addis Ababa (25 percent) and the second highest in Harari (20 percent). Of the 316 hospitals and MCH speciality centres that provided delivery services, only 45 and 14 percent were classified as comprehensive and basic EmONC facilities, respectively. Similarly, of the 3,488 health centres, MCH speciality clinics and higher clinics, less than 1 and 5 percent were classified as CEmONC and BEmONC, respectively. One hundred and twenty-two (52 percent) public hospitals were functioning as CEmONC and 39 (17 percent) were performing as BEmONC. Of the 3,426 public health centres, only 5 percent were categorized as BEmONC. Public CEmONC health centres were less than 1 percent. As expected, most EmONC facilities were located in urban rather than rural areas.

[23] The 3-month reference period was chosen because it provides a snapshot of the functioning of a facility at the time of the visit and recall is more accurate over shorter periods.

Table 3.1.2: Percent distribution of facilities according to EmONC status, by facility type, region, managing authority, and location, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres					Health centres/clinics[1]					All facilities				
	Number of facilities	CEmONC	BEmONC	Partially functioning[2]	Non-EmONC[3]	Number of facilities	CEmONC	BEmONC	Partially functioning[2]	Non-EmONC[3]	Number of facilities	CEmONC	BEmONC	Partially functioning[2]	Non-EmONC[3]
National	316	45%	14%	40%	1%	3,488	0%	5%	94%	1%	3,804	4%	6%	89%	1%
Region															
Tigray	40	38%	25%	38%	0%	215	0%	8%	91%	0%	255	6%	11%	82%	0%
Afar	7	43%	0%	57%	0%	70	0%	3%	84%	13%	77	4%	3%	82%	12%
Amhara	58	45%	10%	43%	2%	818	0%	8%	91%	0%	876	3%	9%	88%	0%
Oromia	77	61%	13%	26%	0%	1,328	0%	4%	96%	0%	1,405	3%	4%	92%	0%
Somali	10	70%	10%	20%	0%	151	1%	7%	87%	5%	161	6%	7%	83%	5%
Benishangul-Gumuz	3	67%	0%	33%	0%	40	0%	5%	95%	0%	43	5%	5%	91%	0%
SNNP	60	38%	20%	38%	3%	713	0%	1%	98%	1%	773	3%	2%	93%	1%
Gambella	1	100%	0%	0%	0%	26	0%	0%	88%	12%	27	4%	0%	85%	11%
Harari	7	43%	0%	57%	0%	8	0%	0%	100%	0%	15	20%	0%	80%	0%
Addis Ababa	47	30%	9%	62%	0%	104	1%	18%	81%	0%	151	10%	15%	75%	0%
Dire Dawa	6	17%	0%	67%	17%	15	0%	0%	100%	0%	21	5%	0%	90%	5%
Managing authority															
Public/government	236	52%	17%	31%	1%	3,426	0%	5%	94%	1%	3,662	3%	6%	90%	1%
Private-for-profit	61	23%	3%	70%	3%	22	5%	27%	64%	5%	83	18%	10%	69%	4%
Private-not-for-profit[4]	19	32%	11%	58%	0%	40	5%	5%	90%	0%	59	14%	7%	80%	0%
Location															
Urban	293	46%	14%	39%	1%	1,204	0%	9%	90%	1%	1,497	9%	10%	80%	1%
Rural	23	30%	9%	57%	4%	2,284	0%	3%	96%	1%	2,307	0%	3%	95%	1%

[1] Includes MCH specialty clinics and higher clinics.

[2] Partially functioning indicates those facilities providing some signal functions but missing at least one BEmONC signal function.

[3] Non-EmONC indicates those facilities providing no EmONC signal functions.

[4] Includes NGO, faith-based, or mission facilities.

The international recommendation is a minimum of 5 EmONC facilities for every 500,000 population. In 2016, 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 (Table 3.1.3). The minimum recommendation also indicates that at least one of the 5 EmONC facilities should be comprehensive. The recommendation was 184 and 148 were fully functioning as comprehensive EmONC facilities, leaving a gap of 36 facilities. The availability of EmONC facilities varied across regions with the least availability in SNNP (22 percent) and Dire Dawa (22 percent) and the greatest in Harari (126 percent) and Addis Ababa (113 percent). Harari and Addis Ababa exceeded the minimum recommended number of EmONC facilities while 7 out of 11 regions were below the national average (40 percent).

Table 3.1.3: Availability of EmONC facilities (EmONC Indicator 1), by region, Ethiopia EmONC, 2016

		BEmONC and CEmONC facilities				CEmONC facilities			
	Population[1]	Recommended[2]	Actual	Actual as a percent of recommended	Gap	Recommended[2]	Actual	Actual as a percent of recommended	Gap
		n	n	%	n	n	n	%	n
National	92,085,000	921	370	40%	551	184	148	80%	36
Region									
Tigray	5,151,000	52	44	85%	8	10	16	155%	-6
Afar	1,768,000	18	5	28%	13	4	3	85%	1
Amhara	20,771,000	208	101	49%	107	42	26	63%	16
Oromia	34,575,000	346	111	32%	235	69	48	69%	21
Somali	5,599,000	56	20	36%	36	11	9	80%	2
B-Gumuz	1,035,000	10	4	39%	6	2	2	97%	0
SNNP	18,720,000	187	42	22%	145	37	24	64%	13
Gambella	422,000	4	1	24%	3	1	1	118%	0
Harari	238,000	2	3	126%	-1	0	3	630%	-3
Addis Ababa	3,353,000	34	38	113%	-4	7	15	224%	-8
Dire Dawa	453,000	5	1	22%	4	1	1	110%	0

[1] Source: Federal Ministry of Health, Health and Health Related Indicators – 2015/2016. Planning and Programming Department: 2016.
[2] Recommendation is a minimum of 5 EmONC facilities per 500,000 population, where at least 1 is comprehensive. Source: WHO, UNFPA, UNICEF, AMDD. Monitoring emergency obstetric care: a handbook. Geneva: World Health Organization; 2009.

The Ethiopian HSTP[24] has targeted one health centre (basic EmONC facility) for every 20,000 rural and 40,000 urban populations. In addition, the HSTP recommends one primary hospital (comprehensive EmONC facility) for every 100,000 population, one general hospital for every 1,500,000 population, and one specialized or referral hospital for every 5,000,000 population. Accordingly, 4,158 and 1,001 health facilities would be required to serve the country in a basic and comprehensive EmONC capacity, respectively

[24] Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). Health Sector Transformation Plan: 2015/16 – 2019/20. Addis Ababa, Ethiopia: FMOH, 2015.

(Figure 3.1.1). The number of basic and comprehensive EmONC facilities recommended per the UN standards is 737 health centres/MCH speciality clinics/higher clinics and 184 hospitals/MCH speciality centres. However, due to under performance, large gaps remain, especially for basic EmONC facilities.

As a final perspective on EmONC status, governments often designate health facilities to be either a basic or comprehensive EmONC facility. Sometimes the designation is selective and based on criteria such as distance, availability of ambulances, number of births or population, and other times, the designation follows the hierarchy of the health system where all health centres might be designated to be BEmONC and all hospitals designated to be CEmONC. To what extent designation is aspirational or fulfilled is answered in the assessment.

The data collectors inquired whether the facility had been designated as BEmONC or CEmONC. Table 3.1.4 shows that 253 facilities reported that they had been designated as CEmONC and 2,727 had been designated as BEmONC, but of these, 148 and 222, respectively, were fully functioning at their designated level, again reinforcing gaps to be addressed. The relationship between a facility's self-reported 'designation' and the goals set by the HSTP and FMOH targets above is not clear, but these self-reports certainly suggest that facility staff were well aware of the concept of EmONC and it might be seen as a step toward those targets.

Figure 3.1.1: Current EmONC status of facilities and different planning scenarios, Ethiopia EmONC, 2016

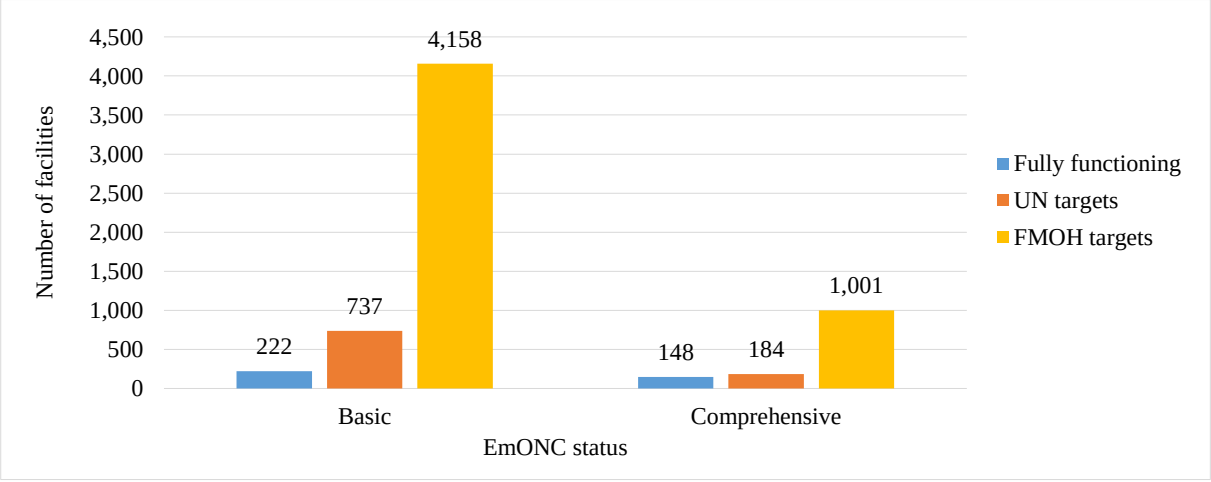


Table 3.1.4: Percent of facilities that are designated as CEmONC or BEmONC, and percent functioning at that level, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	All facilities	Designated as CEmONC		Functioning as CEmONC		Designated as BEmONC		Functioning as BEmONC	
	n	n	%	n	%[1]	n	%	n	%[1]
National	3,804	253	7%	148	58%	2,727	72%	222	8%
Region									
Tigray	255	35	14%	16	46%	192	75%	28	15%
Afar	77	7	9%	3	43%	36	47%	2	6%
Amhara	876	45	5%	26	58%	646	74%	75	12%
Oromia	1,405	58	4%	48	83%	1,080	77%	63	6%
Somali	161	10	6%	9	90%	83	52%	11	13%
Benishangul-Gumuz	43	2	5%	2	100%	36	84%	2	6%
SNNP	773	50	6%	24	48%	518	67%	18	3%
Gambella	27	1	4%	1	100%	26	96%	0	0%
Harari	15	5	33%	3	60%	8	53%	0	0%
Addis Ababa	151	35	23%	15	43%	87	58%	23	26%
Dire Dawa	21	5	24%	1	20%	15	71%	0	0%
Facility type									
Hospitals/MCH specialty centres	316	229	72%	142	62%	33	10%	43	130%
Health centres/clinics[2]	3,488	24	1%	6	25%	2,694	77%	179	7%
Managing authority									
Public/government	3,662	205	6%	125	61%	2,684	73%	210	8%
Private-for-profit	83	39	47%	15	38%	10	12%	8	80%
Private-not-for-profit[3]	59	9	15%	8	89%	33	56%	4	12%
Location									
Urban	1,497	237	16%	141	59%	1,014	68%	149	15%
Rural	2,307	16	1%	7	44%	1,713	74%	73	4%

[1] Percent functioning is calculated out of of facilities designated as CEmONC or BEmONC.

[2] Includes MCH specialty clinics and higher clinics.

[3] Includes NGO, faith-based, or mission facilities.

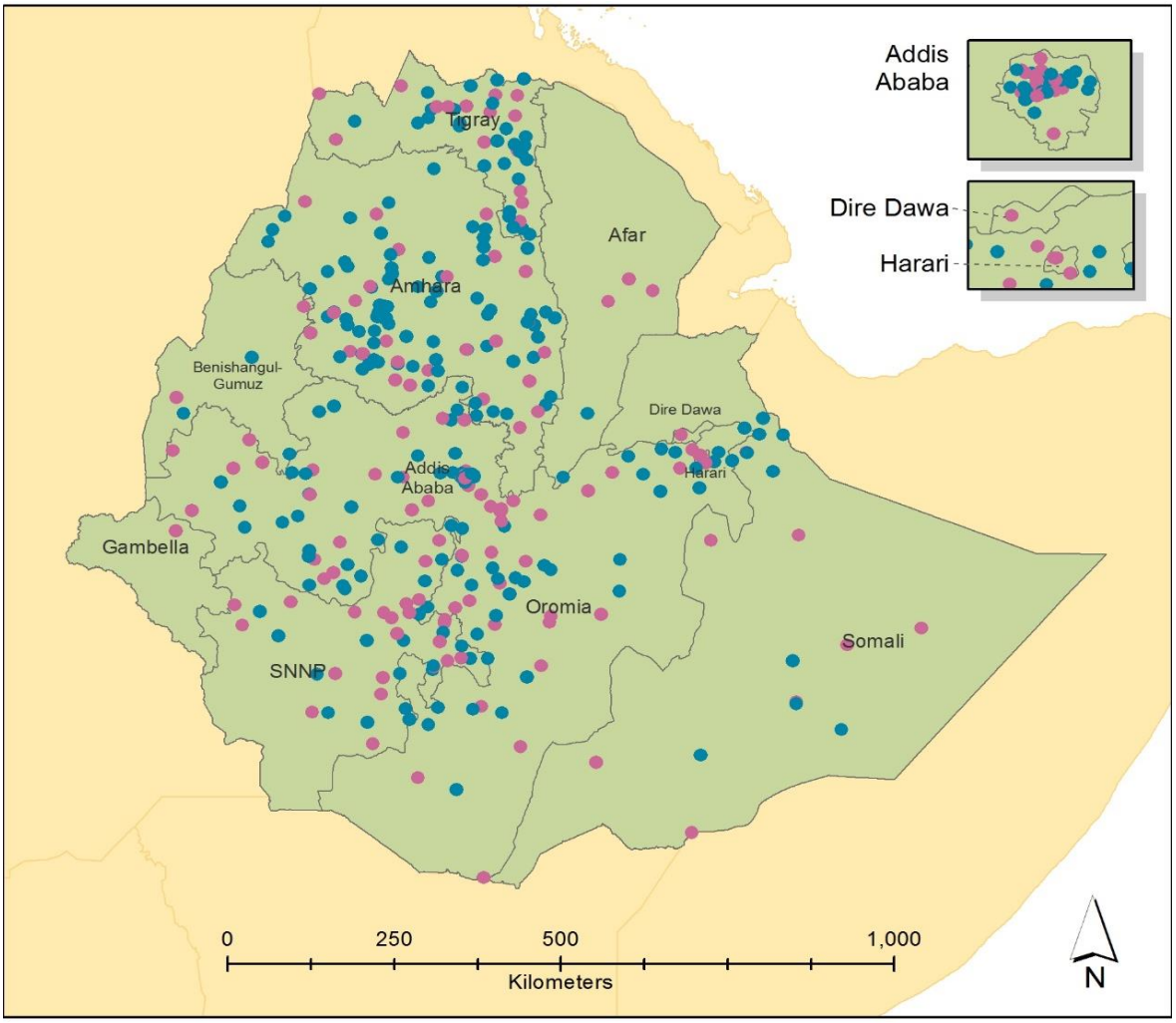
3.2 Indicator 2: Geographic distribution (national and sub-national) of EmONC facilities

This indicator looks at the geographic distribution of EmONC facilities at the regional level. Map 3.2.1 shows the EmONC facilities in the centre of the country and in densely populated cities, with marked regional variation in the availability of EmONC facilities. According to Table 3.1.3, the ratio of EmONC facilities to population at the national level shows 40 percent of the recommended number, or 2 EmONC facilities per 500,000. The regions falling below the national average were Dire Dawa, SNNP, Gambella, Afar, Oromia, Somali, and Benishangul-Gumuz. The only regions to meet the minimum number of recommended EmONC facilities were Harari and Addis Ababa, both densely populated cities. In sparsely populated areas the minimum recommended number of EmONC facilities will not ensure the same kind of access as more populated areas.

Cognizant of this historical scenario, the 2011 Ethiopia DHS asked women whether distance to health facilities was a barrier to accessing health care services. Accordingly, distance ranked third (after concerns about the availability of transport and money for treatment) among the top potential problems in seeking medical care. Two-thirds (66 percent) of the women interviewed reported that distance was a problem. Women from sparsely populated regions like Afar, Somali, Benishangul-Gumuz, and Gambella were more likely to report distance as a problem than women in other regions (>70 percent)[25].

[25] Central Statistics Agency, ICF. Ethiopia Demographic and Health Survey) 2011; March 2012, Addis Ababa, Ethiopia

Map 3.2.1: Locations of BEmONC and CEmONC Facilities, Ethiopia EmONC, 2016



EmONC status

- BEmONC
- CEmONC

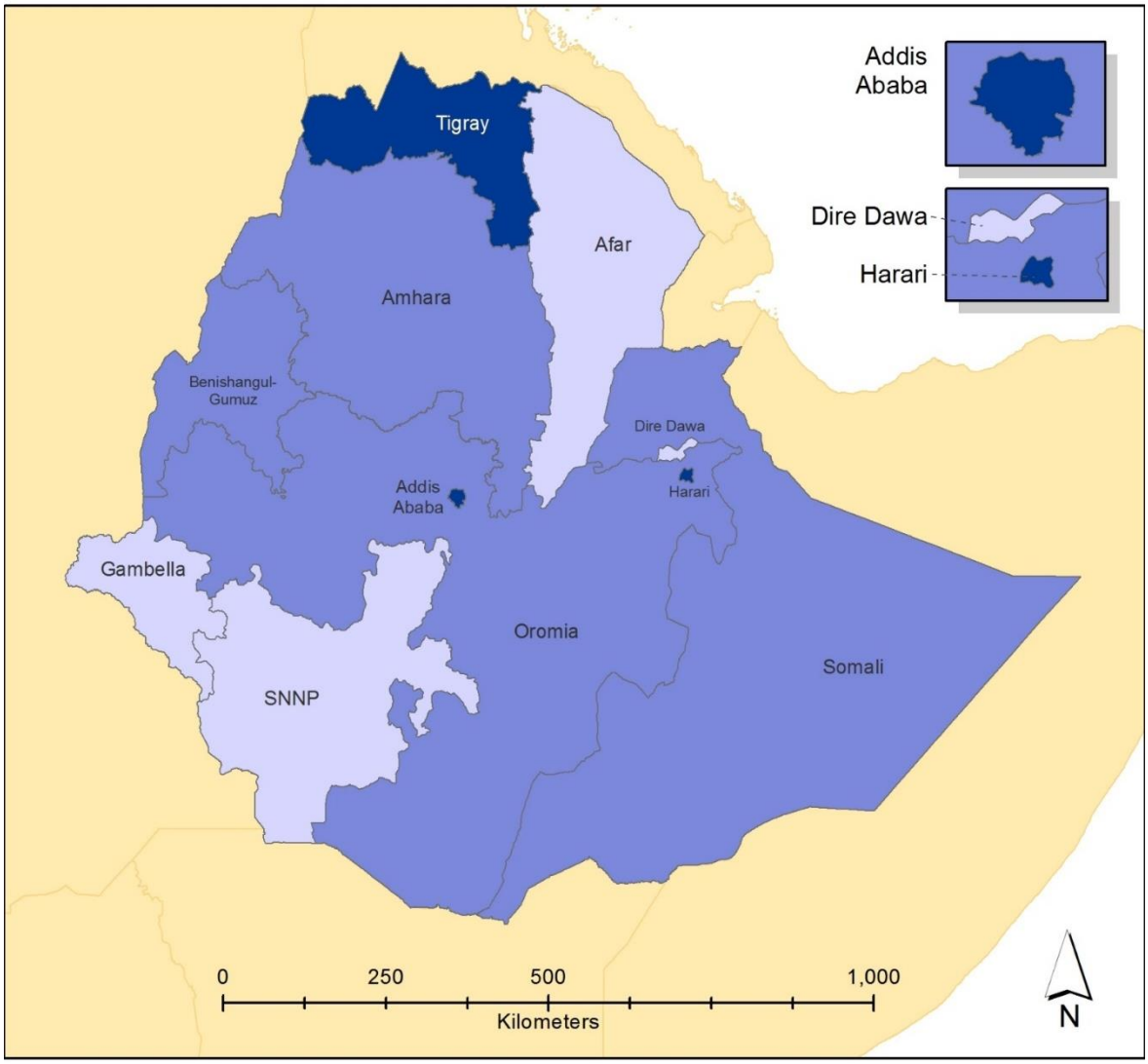
*Basic EmONC are facilities that provide the seven basic signal functions (parenteral antibiotics, parenteral uterotonics, parenteral anticonvulsants, resuscitation of a newborn with bag and mask, manual removal of placenta, removal of retained products of conception, and assisted vaginal delivery). Comprehensive EmONC facilities are facilities that provide Basic EmONC plus caesarean section and blood transfusion.

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Map 3.2.2: Percentage of Recommended EmONC Facilities per 500,000 Population



Recommended EmONC facilities

- 22.1%-30%
- 30.1%-50%
- 50.1%-80%
- 80.1%-126.1%

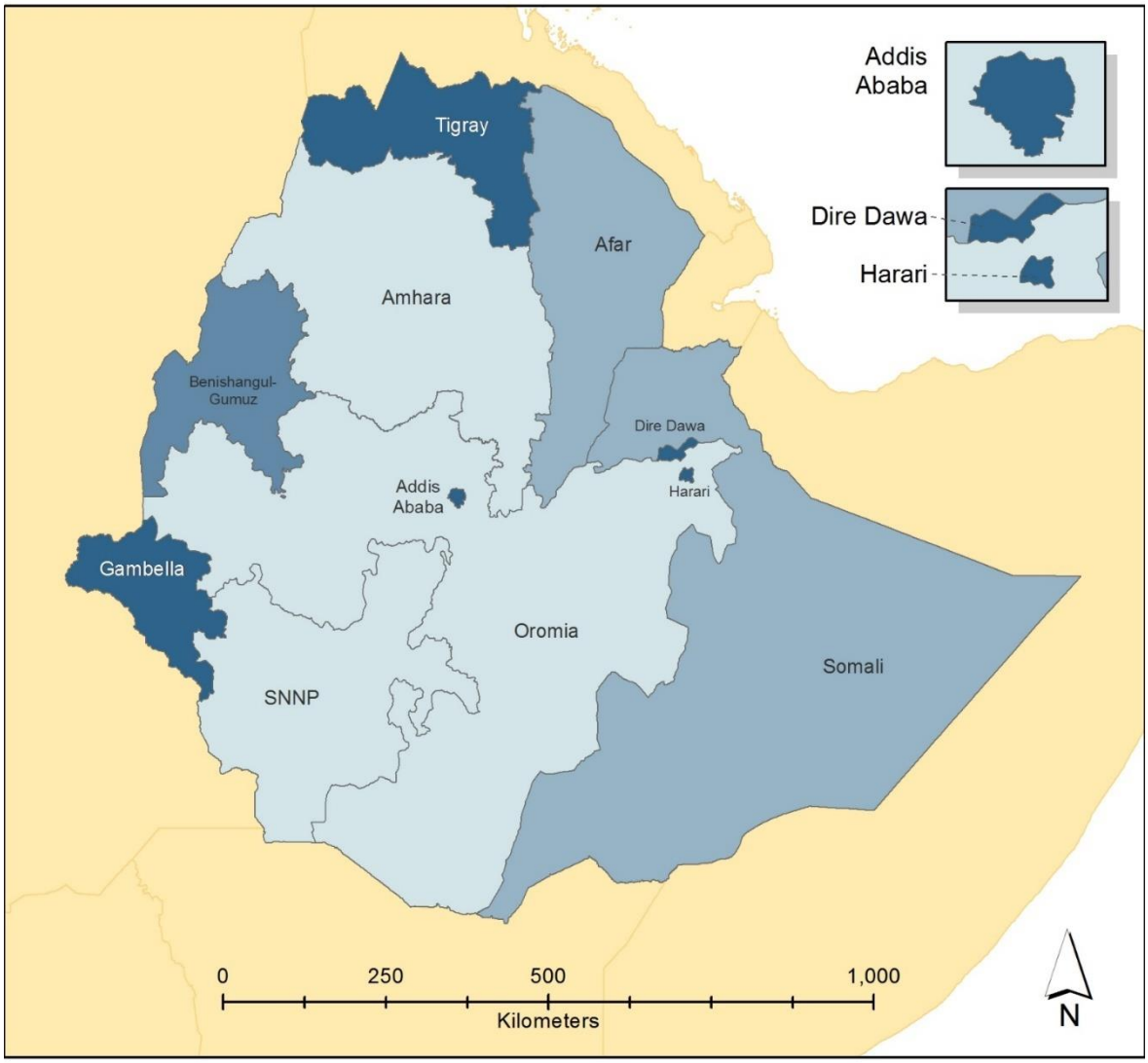
*WHO, UNFPA, and UNICEF recommend as a minimum 5 EmONC facilities per 500,000 population where at least 1 is Comprehensive (*Monitoring emergency obstetric care: a handbook*, 2009)

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Map 3.2.3: Percentage of Recommened CEmONC Facilities per 500,000 Population



Recommended CEmONC facilities

- 62.6% - 70%
- 70.1% - 90%
- 90.1% - 100%
- 100.1% - 630.3%

*WHO, UNFPA, and UNICEF recommend as a minimum 5 EmONC facilities per 500,000 population where at least 1 is Comprehensive (*Monitoring emergency obstetric care: a handbook*, 2009)

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

3.3 Indicator 3: Proportion of all births in facilities

The Government of Ethiopia aims to increase skilled birth attendance from 62 to 90 percent by 2020[26]. The total number of deliveries attended between January and December 2015 was 1,924,330, or 66 percent of expected births, in the 3,804 health facilities with maternity services (Table 3.3.1). Only 13 percent of all births took place in fully functioning EmONC facilities. Harari (100 percent) and Addis Ababa (95 percent) had the highest proportions of women giving birth in a facility, while Somali had the lowest (12 percent), followed by Afar (14 percent), and Gambella (25 percent) (Table 3.3.2A on page 318 in the Appendix for the regional percent distributions of institutional deliveries by facility type, EmONC status, managing authority, and location).

The institutional birth rate increased by almost 60 percentage points since the 2008 EmONC assessment (7 percent, based on births between July 2007 and June 2008)[27]. This rate is much higher than the Ethiopia DHS 2016, which estimated 26 percent based on births in the five years preceding the survey[28]. The 2016 EmONC institutional birth rate was marginally lower than the HMIS figure of 72 percent for 2015/2016[29]. The higher estimate from the HMIS may have included deliveries that took place in lower level health facilities such as health posts that were not included in the EmONC assessment. It is not clear if all birth attendants at the facilities covered by the HMIS or the EmONC assessment are skilled. Variation could also be a function of different data sources or methodology.

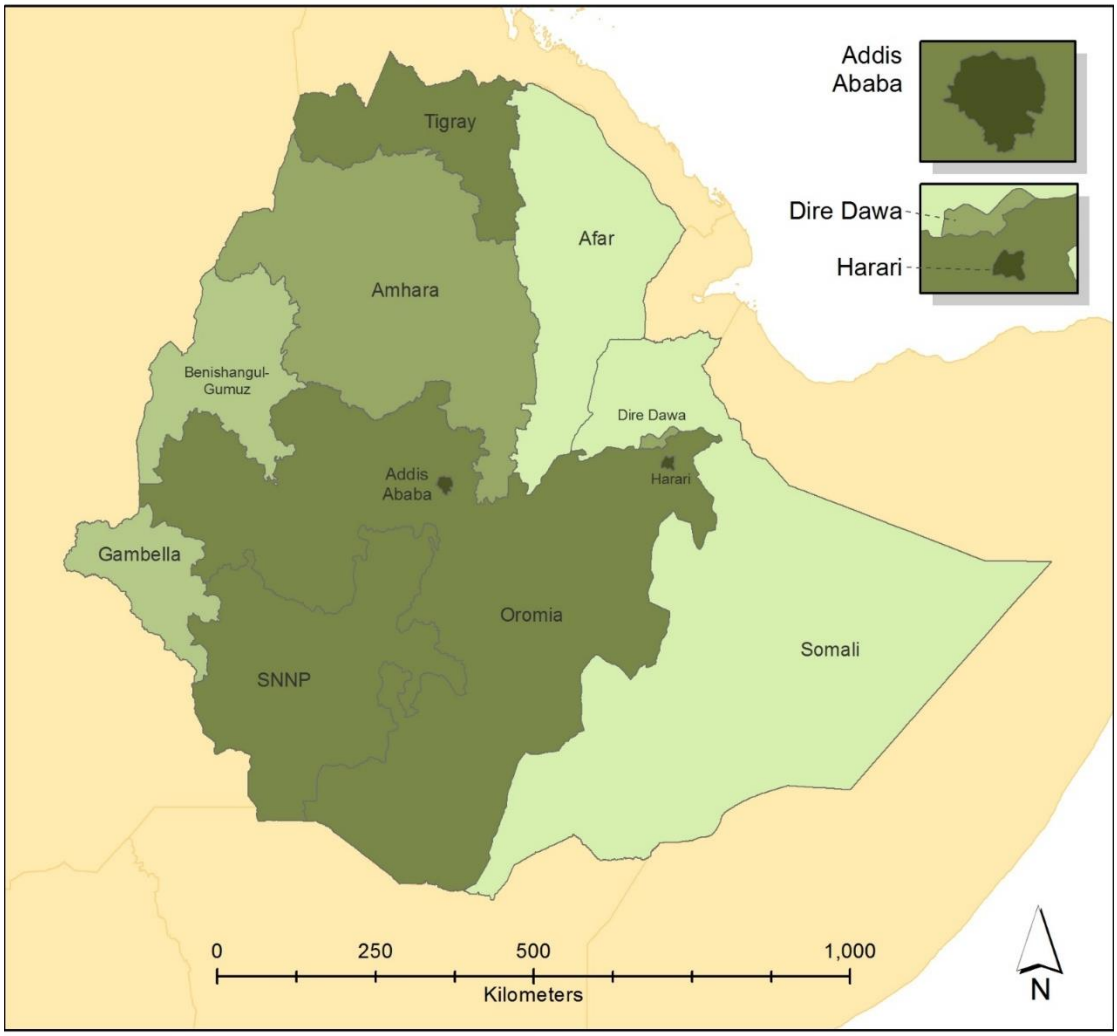
[26] Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). Health Sector Transformation Plan: 2015/16 – 2019/20. Addis Ababa, Ethiopia, 2015.

[27] Federal Ministry of Health, UNICEF, UNFPA, WHO, AMDD. National Baseline Assessment for Emergency Obstetric and Newborn Care Ethiopia 2008. Addis Ababa, Ethiopia: 2009.

[28] Central Statistics Agency, ICF. Ethiopia Demographic and Health Survey 2016: Key Indicators Report. Addis Ababa. Ethiopia and Rockville, Maryland: CSA and ICF, 2016.

[29] Federal Ministry of Health of Ethiopia. Health and Health Related Indicators – 2015/2016. Addis Ababa: Planning and Programming Department, MOH: 2016.

Map 3.3.1: Regional Institutional Delivery Rates



IDR

- 12.6%-20%
- 20.1%-40%
- 40.1%-60%
- 60.1%-80%
- 80.1%-103.6%

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Table 3.3.1: Percent of expected births attended in all facilities and EmONC facilities (EmONC Indicator 3), by region, Ethiopia EmONC, 2016

			All facilities		EmONC facilities	
	Population[1]	Expected births[2]	Number of deliveries	Percent of expected births	Number of deliveries	Percent of expected births
National	92,085,000	2,928,303	1,924,330	66%	390,113	13%
Region						
Tigray	5,151,000	163,802	113,425	69%	41,823	26%
Afar	1,768,000	56,222	7,678	14%	2,223	4%
Amhara	20,771,000	660,518	386,131	58%	74,996	11%
Oromia	34,575,000	1,099,485	844,287	77%	140,220	13%
Somali	5,599,000	178,048	22,036	12%	12,289	7%
Benishangul-Gumuz	1,035,000	32,913	12,288	37%	3,842	12%
SNNP	18,720,000	595,296	417,697	70%	57,668	10%
Gambella	422,000	13,420	3,383	25%	1,729	13%
Harari	238,000	7,568	7,579	100%	4,851	64%
Addis Ababa	3,353,000	106,625	101,401	95%	46,986	44%
Dire Dawa	453,000	14,405	8,425	58%	3,486	24%

[1] Source: Federal Minstry of Health. Health and Health Related Indicators 2015-2016. Addis Ababa, MOH: 2016.

[2] Expected births are calculated as (population) * (crude birth rate). Crude birth rate = 31.8 per 1,000 population for national and all regions. Source: Ethiopia Demographic and Health Survey 2016: Key Findings Report. Addis Ababa, 2016.

3.4 Indicator 4: Met need for EmONC services

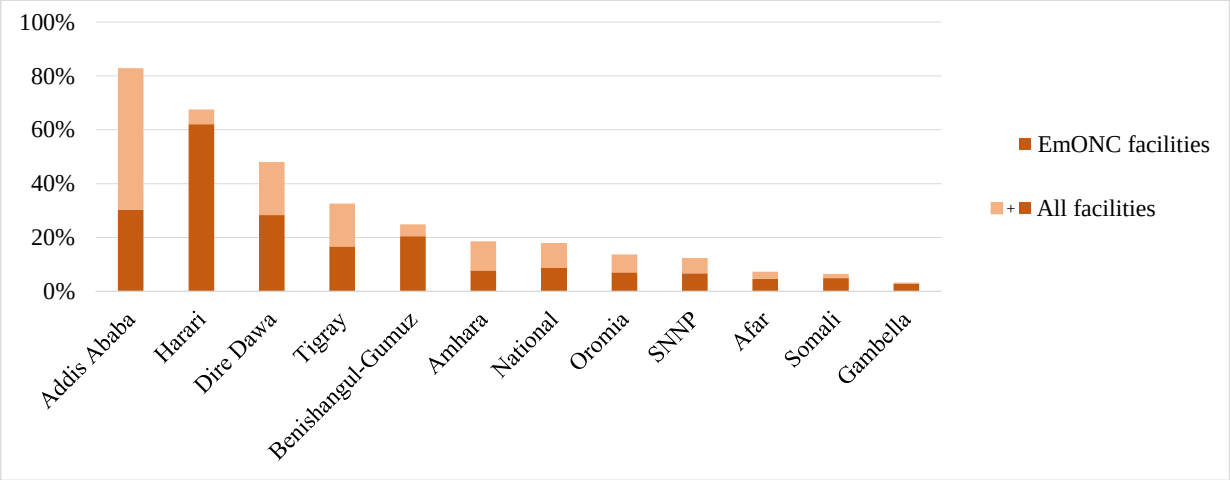
According to the UN estimate, 15 percent of expected births in the population are likely to develop major direct obstetric complications. In the 12 months of 2015, there were 2,928,303 expected births and 439,245 expected complications. Complications of antepartum and postpartum haemorrhage/retained placenta, postpartum sepsis, severe pre-eclampsia and eclampsia, prolonged or obstructed labour, ruptured uterus, complications from abortion, and ectopic pregnancy were considered for the calculation of met need for EmONC. If a woman presented with more than one complication, the data collectors with the help of facility staff selected the complication believed to be the most life-threatening. The number of women with complications was counted, not the number of complications.

Of the 439,245 women expected to have major direct obstetric complications, only 18 percent (78,852) received treatment at the surveyed health facilities. Only 9 percent (38,196) received treatment in EmONC facilities. Met need varied widely among regions, with the highest met need in Addis Ababa (83 percent) and the lowest in Gambella (3 percent) (Figure 3.4.1 and Table 3.4.1A in the Appendix, page 319).

High met need in Addis Ababa, Harari, and Dire Dawa may be driven by easier access to and higher use of available services. Referral to these regions might also be a factor. For example, it is likely that women from Oromia or Somali regions sought care in Dire Dawa or Harari if they experienced an obstetric emergency. A similar pattern might happen in Addis Ababa with women coming from the surrounding

Oromia region. Low met need could also be due to poor recording of obstetric complications treated in health facilities.

Figure 3.4.1: Percent of women expected to experience major direct obstetric complications who developed complications and delivered in EmONC facilities and all facilities (Met Need for EmONC), by region, Ethiopia EmONC, 2016

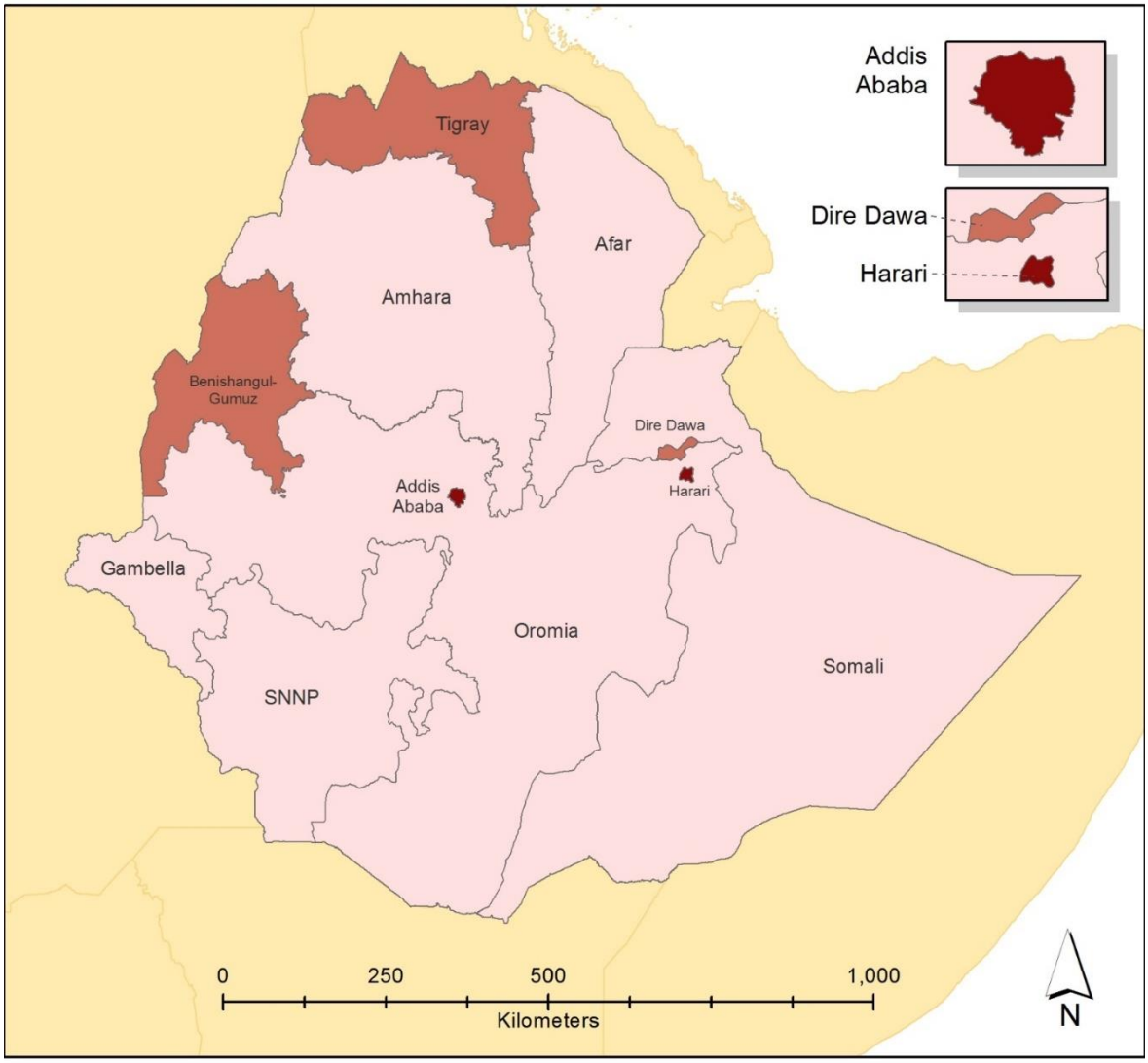


Met need with post-abortion complications

As indicated in the EmONC handbook, severe complications of abortion are included among the major direct obstetric complications used to calculate met need. From experience, however, recording of obstetric complications is often challenged by using different definitions and underreporting. In the case of abortion complications, distinguishing between severe and non-severe abortion complications simply might not happen. Adding all post-abortion complications to the calculation of met need gives a fuller picture of women's need for services and the resources spent on treating obstetric complications.

When the non-severe complications were added, met need increased from 18 percent to 29 percent in all facilities and from 9 to 15 percent in EmONC facilities. The impact of adding the non-severe post-abortion cases also varied across regions, adding as many as 93 percentage points in Harari to only 3 percentage points in Somali. Again, the very high percentages of met need in Harari and Addis Ababa might be due to accessibility of post-abortion care services and referrals coming from the surrounding Oromia region for both cities (Table 3.4.2A in the Appendix, page 320). It should also be noted that data collectors enumerated safe abortions as a separate category to the severe/life threatening and non-severe abortion complications. Thus, presumably safe abortions were not included in this second calculation of met need for EmONC.

Map 3.4.1: Regional Met Need for EmONC in All Facilities



Met Need

- 2.9%-20%
- 20.1%-50%
- 50.1%-82.8%

*Percentage of women expected to experience major direct obstetric complications who are treated in all facilities.

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Quality of registers

The registration of obstetric complications in logbooks and registers is known to be problematic. For example, abortions might be classified under sepsis or haemorrhage. Determining how severe post-abortion complications was also difficult given the lack of details found in the registers. The potential for overlap or misclassification between ruptured uterus and prolonged/obstructed labour is also recognized. Although data collectors were trained to follow strict definitions for each complication, when collecting the data, they had to depend on what was written in the registers. It was not possible to seek out individual client records and charts given how long such an activity would take for close to 4,000 facilities.

Thus, the EmONC assessment looked at the availability of registers and the quality of data for several key registers: labour and delivery, operating theatre, and for post-abortion care (PAC). A labour and delivery register was available in all hospitals/MCH speciality centres and in 99 percent of health centres/clinics (Table 3.4.3).

Table 3.4.3: Percent of facilities that use registers, by type of facility and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	National	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=3,804	n=316	n=3,488	n=3,662	n=83	n=59
Type of register						
Labour and delivery ward register	99%	100%	99%	100%	98%	100%
Postpartum register	77%	76%	77%	77%	63%	71%
Newborn unit register	28%	41%	26%	28%	16%	24%
Operating theatre register	8%	83%	1%	6%	70%	24%
Gynaecology ward/inpatient department register	11%	70%	5%	9%	49%	25%
Safe abortion/post-abortion register	53%	84%	50%	53%	65%	44%
Discharge register	14%	66%	9%	13%	43%	34%
Death/mortuary register	8%	26%	6%	8%	14%	5%
PMTCT register	58%	83%	56%	58%	80%	66%
Referral/counter-referral register	56%	63%	55%	57%	23%	49%
Antenatal care register	99%	97%	99%	99%	95%	98%
Maternal death reporting format/pad	37%	48%	35%	37%	22%	32%
Family planning register	97%	92%	97%	98%	82%	58%

PMTCT = prevention of mother-to-child transmission (of HIV).

[1] Includes MCH specialty clinics and higher clinics.

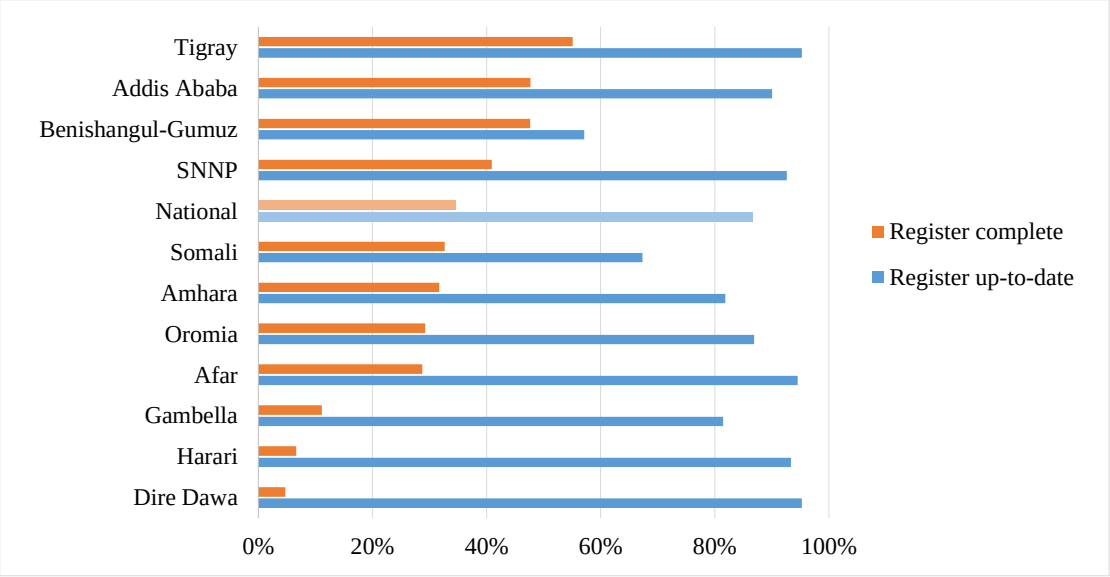
[2] Includes NGO, faith-based, or mission facilities.

This register was used as the primary source for the number of deliveries and related information in almost all facilities irrespective of their managing authority. However, safe abortion or PAC registers were found in a little over half of health facilities (84 percent of hospitals and half of health centres/clinics). Operating theatre registers were also not fully available, even in hospitals/MCH speciality centres (83 percent) –

however, only about this percentage of hospitals had performed caesarean deliveries in the previous 3 months (Table 4.1.1A page 328 in the Appendix), suggesting that OT register availability was high. Sixty-three and 55 percent of hospitals/MCH speciality centres and health centres/MCH/higher clinics were using referral/counter referral registers, respectively, leaving a large gap in the remaining facilities. Availability of labour and delivery register in public and private-not-for-profit was 100 percent. Due to the large number of health centres in the public/government sector, availability of operating theatre register was very low (only 6 percent) compared to private-for-profit (70 percent) and private not-for-profit (24 percent) facilities.

Record-keeping quality was assessed – for completeness (all columns filled in) and for being up-to-date (as of the day of the visit or the day before); the registers assessed were for labour and delivery, PAC and the operating theatre. According to Figure 3.4.2 and Table 3.4.4A in the Appendix (page 321), only 35 percent of facilities (with labour and delivery registers) had a well-filled in (i.e. complete) register. Tigray facilities were the most likely to be complete (55 percent). However, this register was up-to-date in 87 percent of facilities and over 90 percent in Tigray, Afar, SNNP, Harari, Addis Ababa, and Dire Dawa. Likewise, PAC registers were complete in 41 percent of facilities and 66 percent of facilities had up-to-date PAC registers. Not a single PAC register was found complete in Gambella. Operating theatre registers, on the contrary, were much better in terms of completeness and timeliness. This may be because operating theatre registers were found in hospitals with better staffing or supervision.

Figure 3.4.2: Percent of facilities with complete and up-to-date labour and delivery registers, by region, Ethiopia EmONC, 2016

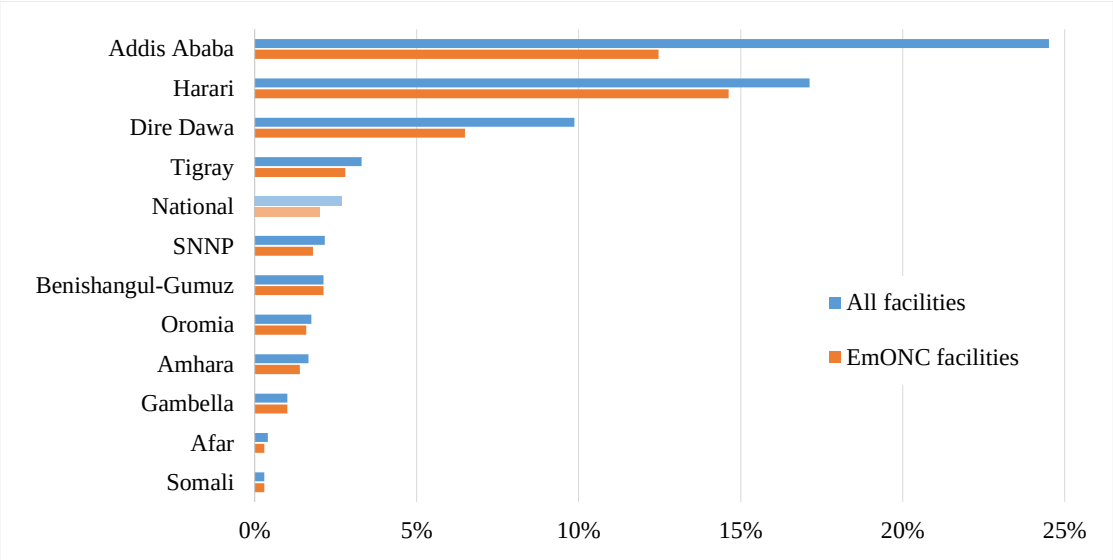


3.5 Indicator 5: Caesarean section as a proportion of all births

In 2015, the World Health Organization issued a consensus statement that says that population-based rates

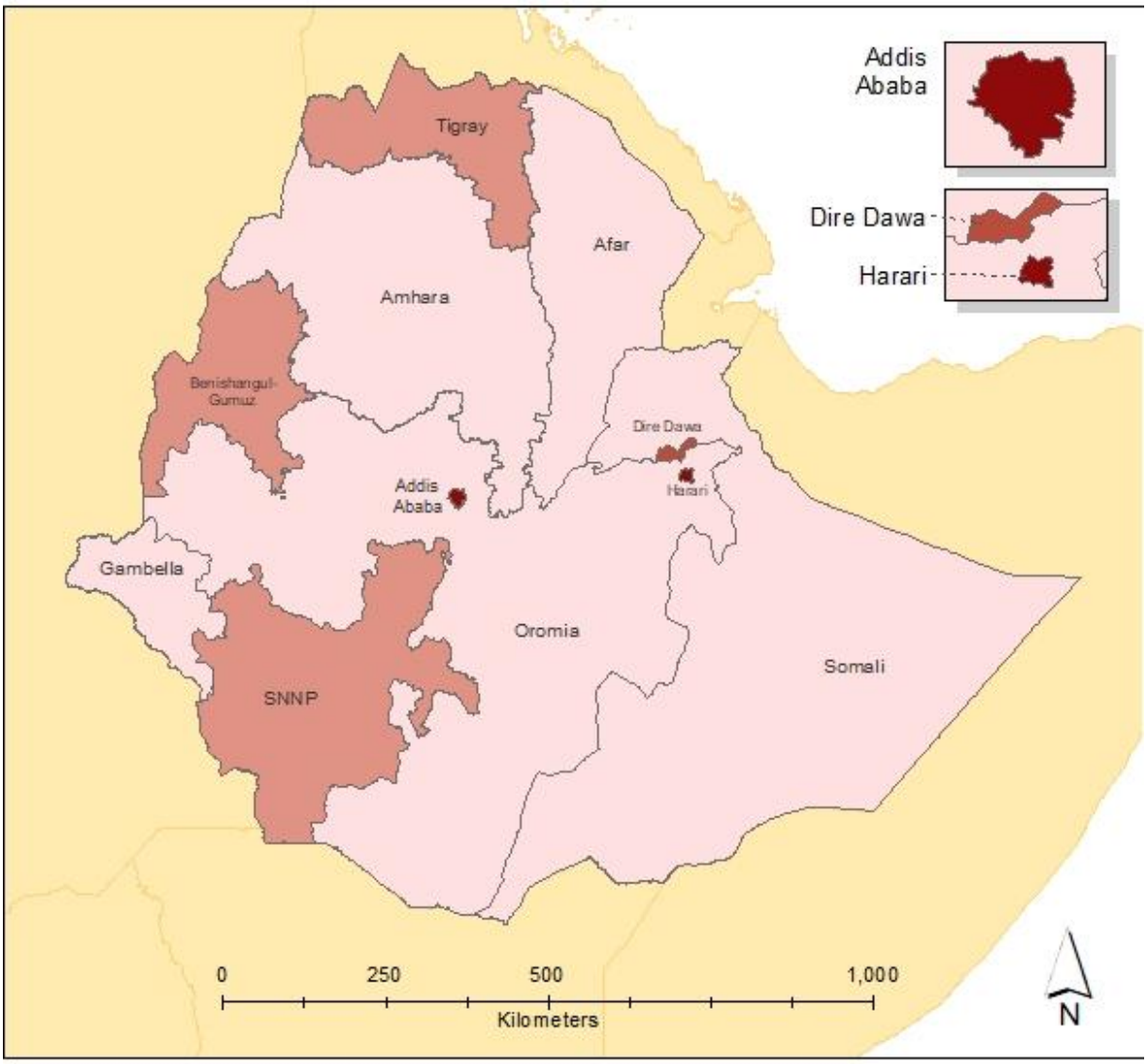
above 10 percent are not associated with reductions in maternal or newborn mortality[30]. In 2015, among 2,928,303 expected births, 3 percent were delivered by caesarean. This caesarean rate is below the 5 percent minimum recommended by the UN (Table 3.5.1A page 322 in the Appendix and Figure 3.5.1). The population-based caesarean section rate varied widely by region, with the highest in Addis Ababa (25 percent), followed by Harari (17 percent), and the lowest in Afar and Somali (less than 1 percent). A similar pattern was observed across regions in EmONC facilities. It is possible that women in the surrounding areas contributed to the high caesarean delivery rates in Addis and Harari, choosing to deliver in the hospitals of these cities. If not, this should raise concerns regarding unnecessary caesareans and serious disparities in access to what should be promoted as life-saving technology but only when medically indicated.

Figure 3.5.1: Percent of expected births delivered by caesarean section in all facilities and EmONC facilities, by region, Ethiopia EmONC, 2016



[30] World Health Organization Human Reproduction Programme A. WHO Statement on caesarean section rates. *Reprod Health Matters*. 2015;23(45):149-50.

Map 3.5.1: Regional Caesarean Delivery Rates



Caesarean Delivery Rate

- 0.3%-2%
- 2.1%-4.9%
- 5.0%-15%- Recommended Range
- 15.1%-25%

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*

**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

3.6 Indicator 6: Direct obstetric case fatality rate (DOCFR)

The 12-month 2015 data included 412 maternal deaths due to direct obstetric complications in all health facilities surveyed (total number of women with direct obstetric complications was 78,852) as seen in Table 3.6.1. The DOCFR is the proportion of women with major direct obstetric complications in facilities who die before discharge. It is an indicator of the quality of how these complications are managed. The international benchmark is less than one percent. An accurate estimate of the DOCFR depends on the correct diagnosis, complete recording of obstetric complications, maternal deaths, and causes of death. Given the high percentage of maternal deaths with no associated cause (52 percent – Table 4.7.1), the calculation of the DOCFR is not very reliable.

With this caveat in mind, the DOCFR at national level was less than 1 percent both in all facilities and EmONC facilities. The DOCFR of all facilities in Tigray, Amhara, Benishangul-Gumuz, Gambella, and Addis Ababa was below 1 percent; the rest of the regions recorded close to 1 percent or slightly above.

Table 3.6.1: Direct obstetric case fatality rate in all facilities and EmONC facilities (EmONC Indicator 6), by region, Ethiopia EmONC, 2016

	All facilities			EmONC facilities		
	Number of women with major DOCs[1]	Number of maternal deaths by major direct causes[1]	DOCFR[2]	Number of women with major DOCs[1]	Number of maternal deaths by major direct causes[1]	DOCFR[2]
National	78,852	412	0.5%	38,196	290	0.8%
Region						
Tigray	8,012	25	0.3%	4,085	21	0.5%
Afar	611	5	0.8%	396	4	1.0%
Amhara	18,406	91	0.5%	7,675	56	0.7%
Oromia	22,667	141	0.6%	11,532	103	0.9%
Somali	1,726	18	1.0%	1,298	12	0.9%
Benishangul-Gumuz	1,229	5	0.4%	1,008	4	0.4%
SNNP	11,087	91	0.8%	6,000	64	1.1%
Gambella	64	0	0.0%	57	0	0.0%
Harari	767	8	1.0%	704	7	1.0%
Addis Ababa	13,244	20	0.2%	4,829	13	0.3%
Dire Dawa	1,039	8	0.8%	612	6	1.0%

DOC = direct obstetric complication; DOCFR = direct obstetric case fatality rate.

[1] Major DOCs and direct causes of maternal death include: ruptured uterus, postpartum sepsis, severe pre-eclampsia/eclampsia, severe complications of abortion, antepartum haemorrhage, obstructed/prolonged labour, postpartum haemorrhage/retained placenta, and ectopic pregnancy (excludes "other" DOCs or direct causes of maternal death).

[2] DOCFR = (number of maternal deaths by direct causes) / (number of women with direct complications).

3.7 Indicator 7: Intrapartum and very early neonatal death rate

The intrapartum and very early (pre-discharge) neonatal death rate is the proportion of births that result in

an intrapartum stillbirth or a very early neonatal death (≤24 hours)[31]. This indicator is intended to measure the quality of intrapartum and newborn care.

During adaptation of the tools, the country team decided to collect information on all stillbirths (without distinguishing between an intrapartum/fresh stillbirth and an antepartum/macerated stillbirth). This decision was made because the HMIS does not require facilities to distinguish between the two types of stillbirths. Neonatal deaths were divided into three age-at-death related groups (< 24 hours, 1 – 7 days, and 7 – 28 days).

Figure 3.7.1 and Table 3.7.1A in the Appendix page 323 show institutional stillbirth rates, the early neonatal death rate, and the neonatal death rate among all facilities. Table 3.7.2A in the Appendix page 324 shows the same rates but among EmONC facilities only. First, we discuss the rates in all facilities.

Nationally, the institutional stillbirth rate was 15 per 1,000 deliveries, the very early neonatal death rate 2 per 1,000 live births, and the neonatal death rate 3 per 1,000 live births. Stillbirth rates that were twice the national rate or more were reported by Afar, Somali, Benishangul-Gumuz, Harari, and Dire Dawa. The region with the lowest stillbirth rate was SNNP (11 per 1,000 deliveries). Afar and Addis Ababa had the highest very early neonatal death rate and Addis Ababa and Gambella the highest neonatal death rates. Oromia had the lowest very early neonatal and neonatal death rates.

Hospitals and MCH speciality centres experienced a higher stillbirth rate (48 per 1,000) than heath centres and clinics (8 per 1,000). The same was true for neonatal death rates. This should be expected since hospitals receive referrals and treat more complicated cases than do health centres and clinics.

The wide variation in rates observed across regions and facility types was not as dramatic among the different managing authorities. Stillbirth rates were lowest among the public facilities (driven by the domination of health centres) and highest among the private-not-for profit facilities: 15 per 1,000 deliveries versus 26 per 1,000. Institutional very early neonatal death rates were highest among the private-for-profit facilities (2.4 deaths per 1,000 live births), while the neonatal death rate highest among the public facilities (3.1 per 1,000 live births).

Stillbirth, very early neonatal, and neonatal death rates were consistently higher in urban than rural areas. This might be explained by the urban location of most hospitals and private facilities.

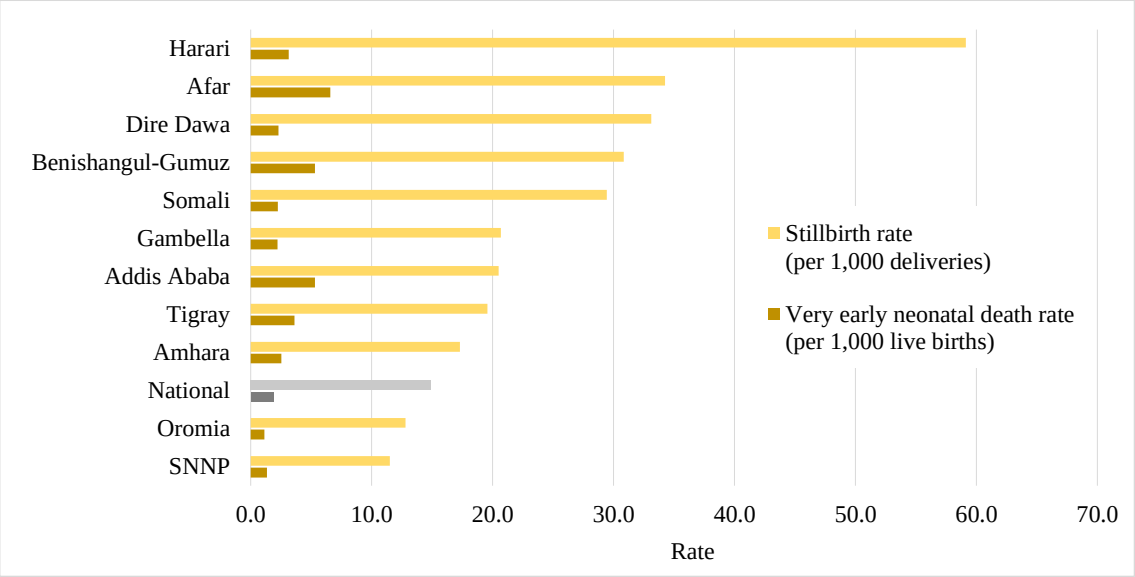
EmONC facility rates (Table 3.7.2A page 324 in the Appendix) tended to be higher than the "all facility" rates. This might be driven by referral patterns where the EmONC facilities attend the worst cases. Stillbirth rates ranged from 23.2 per 1,000 deliveries in Addis Ababa to 88.8 in Harari; early neonatal death rates ranged from 1.8 in Gambella to 12.8 in Afar, and neonatal death rates ranged from 3.6 in Dire Dawa to 16.6 in Benishangul-Gumuz. Among only EmONC facilities, mortality rates were consistently the highest in the public sector.

[31] WHO, UNFPA, UNICEF, AMDD. Monitoring emergency obstetric care: a handbook. Geneva: World Health Organizations; 2009.

In most cases, the median length of stay for a woman in public health facilities after a normal delivery was 12 hours (Table 5.2.1) and was half that in private facilities. Therefore, some very early neonatal deaths may have gone uncounted because they died at home. In addition, only 5 percent of facilities reported having a separate neonatal intensive care unit (Table 6.3.1A page 347 in the Appendix).

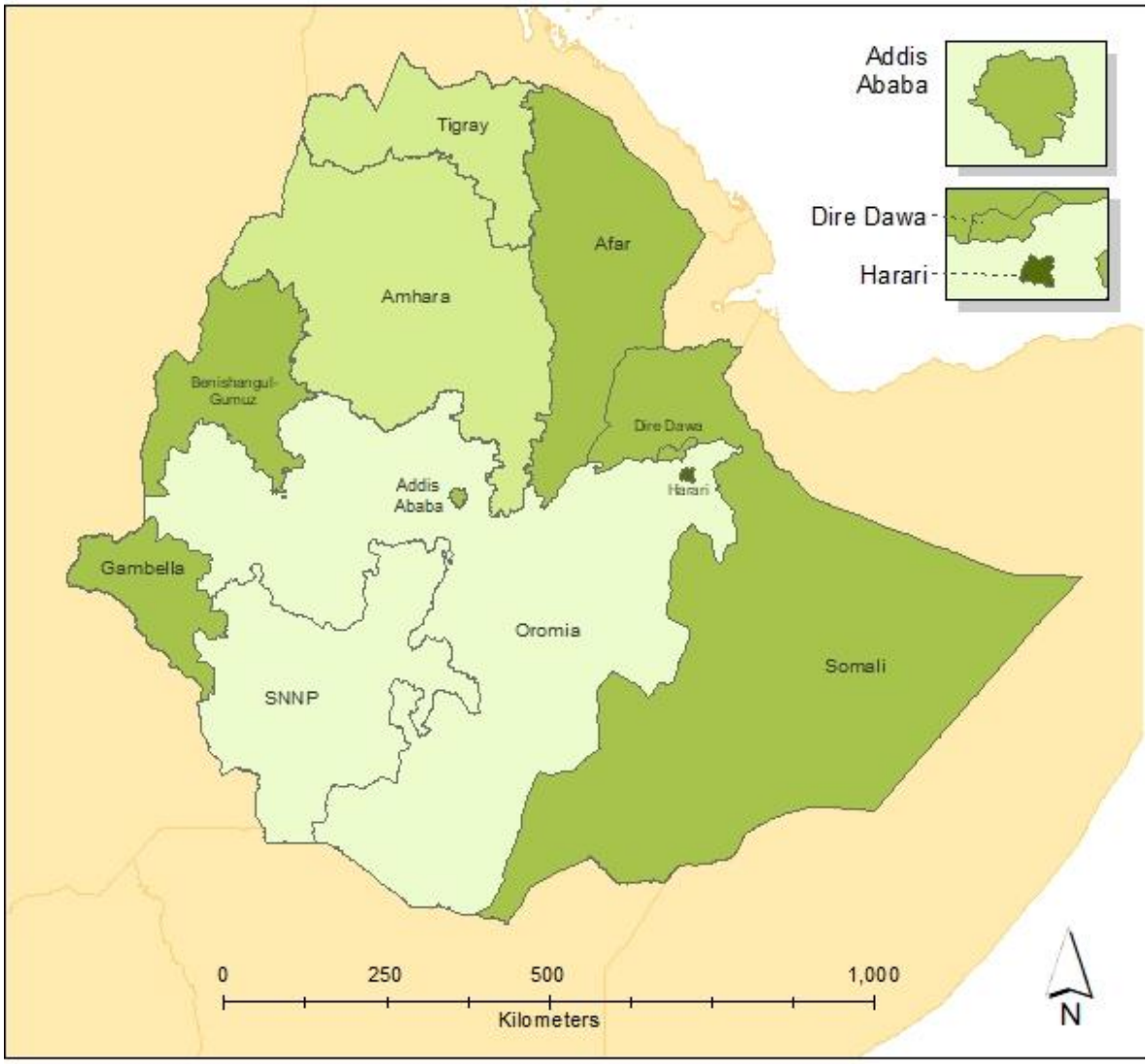
From the total number of institutional live births (1,897,829) in 2015, the preterm birth rate per 1,000 live births was 4.5, while the low birth weight rate was 26.3 per 1,000 live births (based on live births with known birth weight) (Table 3.7.3A page 325 in the Appendix). The rates of preterm and low birth weight were higher in hospitals/MCH specialty centres than in health centres/clinics, and higher in urban areas than in rural areas.

Figure 3.7.1: Stillbirth and very early neonatal death rates in all facilities, by region, Ethiopia EmONC, 2016



Only 3 percent of live births were reported to have initiated kangaroo mother care (KMC) and only one percent of the babies were resuscitated with bag and mask (Table 3.7.4A in the Appendix page 326). Percentages of births who initiated KMC varied across regions. Amhara recorded 5 percent of live births initiating KMC while Tigray, Oromia, and Somali had 2 percent of KMC babies. Afar and Gambella reported less than 1 percent of KMC initiation. Newborn resuscitation with bag and mask demonstrated a similar pattern to KMC. Only 1 to 3 percent of the newborns were resuscitated in the regions except for Oromia, SNNP, and Gambella with less than 1 percent each.

Map 3.7.1: Regional Institutional Stillbirth Rates (per 1,000 facility deliveries)



Stillbirth Rate

- 11.1-15
- 15.1-20
- 20.1-35
- 35.1-59.1

*Stillbirth includes both antepartum and intrapartum

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*

**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

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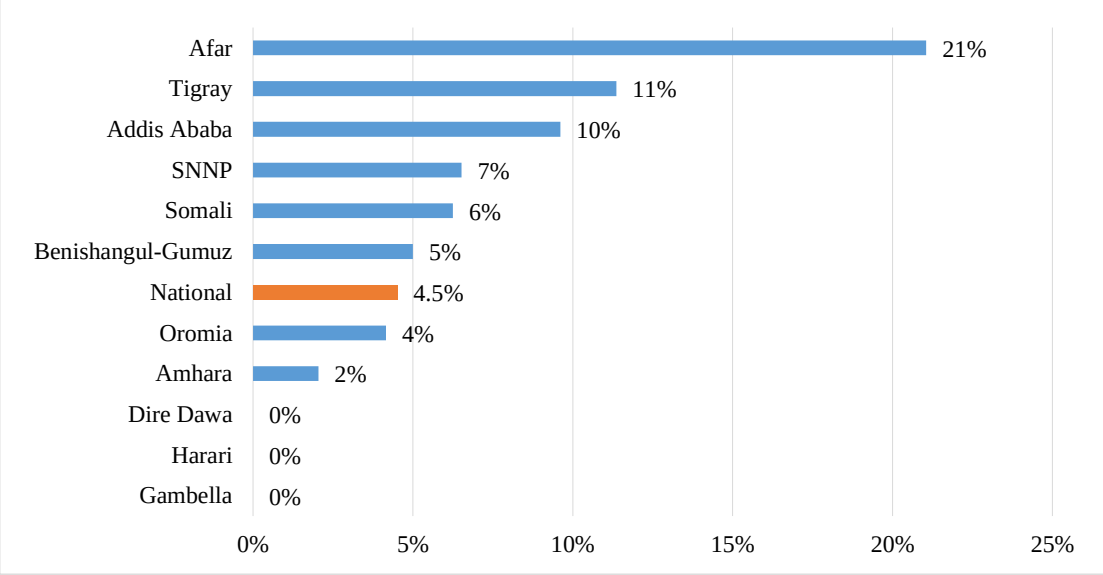
3.8 Indicator 8: Proportion of maternal deaths due to indirect causes

Direct causes of death are those "resulting from obstetric complications of the pregnant state (pregnancy, labour, and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events from any of the above"[32]. *Indirect causes of death* result from "previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by the physiologic effects of pregnancy." This indicator is not governed by an international or national standard. Instead, it highlights the larger social and medical context and has implications for intervention strategies that target the major indirect causes that kill many women of reproductive age (e.g. malaria, HIV).

Nationally, the percentage of institutional maternal deaths due to indirect causes was 5 percent in all facilities and 7 percent in EmONC facilities (Figure 3.8.1 and Table 3.8.1A in the Appendix page 327). The distribution of maternal deaths due to indirect causes varied among the regions from less than one percent in Gambella, Harari and Dire Dawa to 21 percent in Afar in all facilities, to 33 percent in Afar in EmONC facilities. The very small numbers of indirect maternal deaths, especially in Gambella, Harari, Dire Dawa and Benishangul-Gumuz, highlight the problem of identifying indirect maternal deaths and of obtaining information about them since these deaths are less likely than direct causes of death to be found in the obstetric or gynaecology wards.

Figure 3.8.1: Percent of maternal deaths due to indirect causes in all facilities, by region, Ethiopia EmONC, 2016



[32] WHO. International Classification of Diseases. 10th rev ed. Geneva, Switzerland: 2004.

3.9 Comparison of indicators between 2008 and 2016

The 2016 EmONC assessment shows that substantial progress has been achieved across all indicators since 2008 when a baseline for interventions was taken (Table 3.9.1).

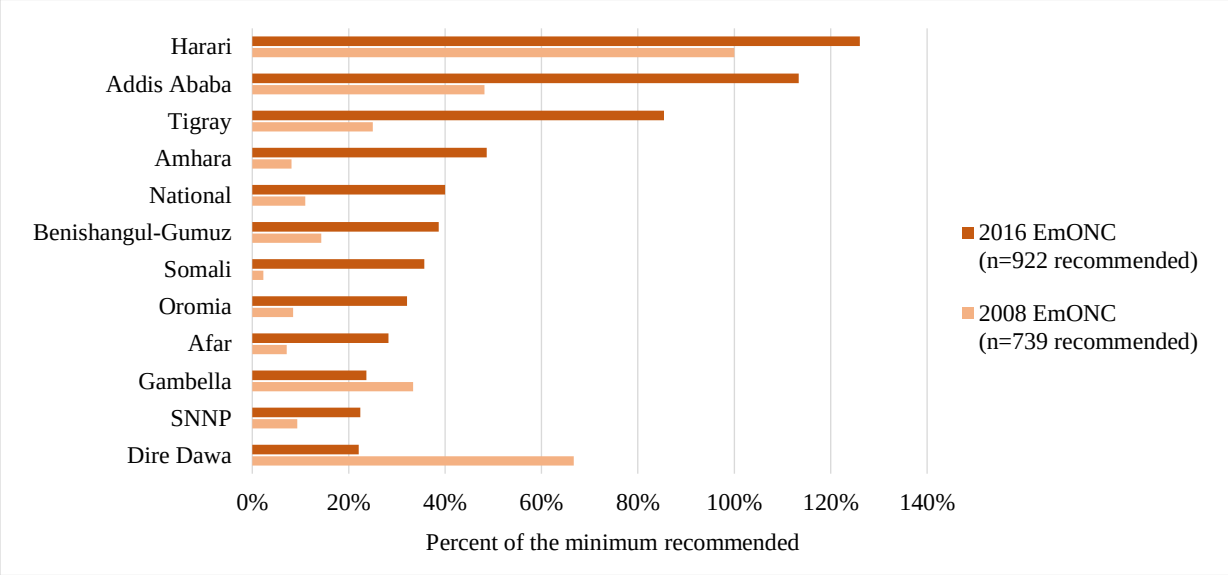
Table 3.9.1: EmONC indicators in 2008 and 2016, Ethiopia EmONC, 2016

	2008		2016	
	All facilities	EmONC facilities	All facilities	EmONC facilities
Indicator 1: Availability of EmONC				
Recommended n	739		922	
Functioning n (%)	83 (11%)		370 (40%)	
Functioning CEmONC n (%)	58 (39%)		148 (80%)	
Functioning BEmONC n (%)	25 (4%)		222 (30%)	
Indicator 2: Subnational availability of EmONC (% of minimum recommended EmONC facilities)				
Tigray	25%		85%	
Afar	7%		28%	
Amhara	8%		49%	
Oromia	8%		32%	
Somali	2%		36%	
Benishangul-Gumuz	14%		39%	
SNNP	9%		22%	
Gambella	33%		24%	
Harari	100%		126%	
Addis Ababa	48%		113%	
Dire Dawa	67%		22%	
Indicator 3: Proportion of births in facilities	7%	3%	66%	13%
Indicator 4: Met need for EmONC (% of expected complications treated)	6%	3%	18%	9%
Indicator 5: Proportion of births delivered by caesarean	0.6%	0.6%	2.7%	2.0%
Indicator 6: Direct obstetric case fatality rate	1.7%	2.2%	0.5%	0.8%
Indicator 7: Stillbirth and newborn mortality rates				
Stillbirth rate (per 1,000 deliveries)	42.2	57.6	14.9	39.1
Very early neonatal mortality rate (1st 24 hours; per 1,000 live births)	3.0	4.6	1.9	5.5
Neonatal mortality rate (0 to <28 days; per 1,000 live births)			3.0	10.1
Indicator 8: Proportion of maternal deaths due to indirect causes	21%	19%	5%	7%

Indicators 1 and 2: Availability of EmONC and Subnational Distribution: The number of fully functioning EmONC facilities increased from 83 to 370 and the percentage of the recommended numbers increased from 11 to 40 percent, a remarkable achievement. The percentage of CEmONC doubled while

the percentage of BEmONC increased seven-fold. All but two regions experienced an increase in availability; Gambella and Dire Dawa with no increases merit further investigation.

Figure 3.9.1: Percent of the minimum recommended number of EmONC facilities in 2008 and 2016, by region, Ethiopia EmONC, 2016



Indicator 3: Proportion of institutional deliveries: The government increasingly expects all deliveries to be attended by skilled professionals in a health facility[33]. The proportion of deliveries that took place in facilities rose from 7 percent in 2008 to 66 percent in 2016. The proportion of deliveries occurring in EmONC facilities increased from 3 percent to 13 percent, indicating that despite the increased delivery in facilities, the clear majority of births took place in facilities not fully prepared or able to treat obstetric emergencies. Not all national surveys show such a dramatic increase.

Indicator 4: Met need for EmONC: For this indicator, the major obstetric complications included were antepartum haemorrhage, postpartum haemorrhage, retained placenta, puerperal sepsis, severe pre-eclampsia and eclampsia, prolonged or obstructed labour, ruptured uterus, ectopic pregnancy, and severe complications of abortion. In 2016, met need for EmONC was 18 percent in all facilities and 9 percent in EmONC facilities, a three-fold increase since 2008. However, the desired level of met need is 100 percent since all women who develop major obstetric complications should receive treatment at a facility. Thus, despite the progress, met need is still very low.

Indicator 5: **Proportion of expected births by caesarean delivery:** The population-based caesarean delivery rate increased from 0.6 percent in 2008 to 2.7 percent in 2016, proportionately a large increase,

[33] Central Statistics Agency, ICF. Ethiopia Demographic and Health Survey 2016: Key Indicators Report. Addis Ababa, Ethiopia and Rockville, Maryland: CSA and ICF, 2016.

but still below 5 percent, which is often considered a minimum level for optimal maternal and newborn outcomes.

Indicator 6: Direct obstetric case fatality rate (DOCFR): The UN target is less than 1 percent. Since 2008, the DOCFR has decreased from 1.7 percent in all facilities and 2.2 percent in EmONC facilities to less than 1 percent for both all and EmONC facilities in 2016. Although the DOCFR was just under 1 percent and the UN maximum acceptable level was achieved, the greater goal is to end all preventable maternal deaths. Also, given that more than half of maternal deaths were reported without a cause of death, this statistic is not very reliable.

Indicator 7 alternatives: stillbirth and early neonatal death rates: Institutional stillbirth rates dropped substantially since 2008, from 42 stillbirths per 1,000 births to 15 in all facilities. However, the stillbirth rate in fully functioning EmONC facilities in 2016 was high – 39 stillbirths per 1,000. This is likely because many of the complicated deliveries and women with suspected foetal problems were referred to higher functioning facilities, thus increasing the death rates at those facilities. The pre-discharge early neonatal death rate (deaths to live births during the first 24 hours or before they were discharged, whichever came first) in all facilities was 3 per 1,000 live births in 2008 and 2 per 1,000 live births in 2016. This rate in all facilities and the higher rate found at EmONC facilities did not change substantially between 2008 and 2016.

Indicator 8: Proportion of maternal deaths due to indirect causes: In 2008, 21 percent of all institutional maternal deaths were attributable to indirect causes (malaria, HIV/AIDS, anaemia, etc.). In 2016, the proportion of indirect deaths declined to 5 percent. One reason for the low rate of indirect maternal deaths was the missing cause of death, affecting the DOCFR and this indicator. Improving the data quality in health facilities should be a priority.

Chapter 4: Additional Obstetric and Newborn Care Indicators for Coverage, Readiness, and Quality

Key Findings

- Provision and readiness to provide the basic EmONC signal functions showed good progress between 2008 and 2016, especially among health centres. The only basic signal function to show a substantial decline in readiness was parenteral antibiotics.
- In 2016 the least provided basic signal function was parenteral anticonvulsants despite 72 percent of facilities reportedly "ready" to provide; only 26 percent of facilities provided this drug, while 80 percent of non-performing facilities explained that no clients had needed an anticonvulsant for hypertensive disorders.
- Regarding readiness in general, human resources were less of a problem than the minimum package of drugs, equipment and supplies. For each signal function, except for manual removal of placenta and assisted vaginal delivery, readiness was undermined by the gap in drugs (e.g., antibiotics, anticonvulsants) or equipment (e.g., removal of retained products, newborn resuscitation). These patterns varied by type of facility.
- Readiness to provide routine delivery services was measured based on infrastructure, respectful maternity care, human resources, infection prevention, availability of drugs, supplies, equipment, and diagnostics. Based on a score of 70, the average facility score was 45.6, with hospitals scoring higher than health centres. Facilities with higher scores tended to serve more women: 38 percent of institutional deliveries took place in the top scoring quartile of facilities.
- Fewer than 10 percent of health centres provided antenatal corticosteroids, IV fluids to newborns, or administration of oxygen; these 3 EmNeC signal functions were primarily the domain of hospitals.
- Hospitals reported midwives as the key cadre to perform the EmONC signal functions. Emergency surgical officers also played an important role. The same pattern could be seen with the EmNeC signal functions – hospitals leading with midwives, followed by nurses and emergency surgical officers. At health centres, all basic EmONC and EmNeC signal functions were performed primarily by midwives or nurses, when performed.
- The institutional caesarean delivery rate at private-for-profit facilities was 54 percent, i.e., more than half of the babies born in these facilities were abdominal deliveries.
- More than half of all maternal deaths (52 percent) were documented with no cause of death, an increase from 10 percent in 2008.
- Sixty percent of all abortions were safe voluntary terminations of pregnancy while 40 percent were incomplete, spontaneous abortions, of which 7 percent showed serious complications.
- Facilities did a much better job of documenting or providing post-abortion contraception than they did documenting or providing postpartum contraception.

4.1 Performance of EmONC and EmNeC signal functions and reasons for non-performance

In this section, we look in detail at the EmONC signal functions and the emergency newborn care (EmNeC) signal functions.

Performance of EmONC signal functions and reasons for non-performance

As shown in Figure 4.1.1, among the 3,804 facilities that provided delivery services, 93 percent performed parenteral uterotonics and 80 percent performed parenteral antibiotics in the three months prior to the survey. The least performed basic signal functions were parenteral anticonvulsants (26 percent) and assisted vaginal delivery (35 percent). Relatively few facilities reported performing the comprehensive signal functions: caesarean delivery (7 percent) and blood transfusion (6 percent). The low percentage for caesarean section (CS) and blood transfusion is due to the limited number of facilities (generally hospitals and MCH specialty centres) that perform these services. Reporting of neonatal resuscitation is under the next section of EmNeC signal functions.

Figure 4.1.1: Percent of facilities that performed each EmONC signal function in the last 3 months, Ethiopia EmONC 2016

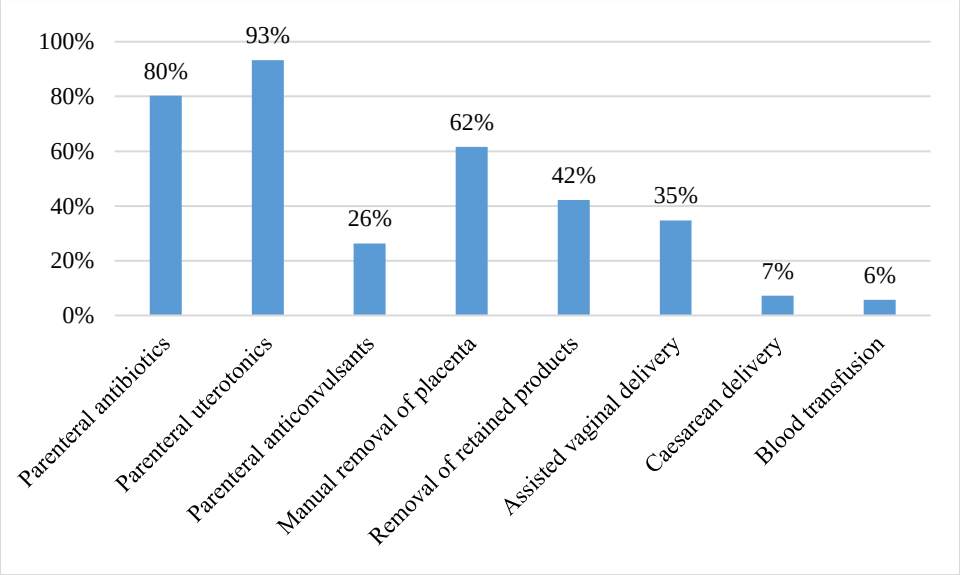


Table 4.1.1A in the Appendix on page 328 shows performance of the EmONC signal functions by region, type of facility, managing authority, and location. One hundred percent of the facilities in Harari region performed parenteral uterotonics followed by Tigray (97 percent), Oromia (95 percent), Dire Dawa (95 percent), Amhara (94 percent), and Addis Ababa (94 percent). Overall, Gambella tended to report the poorest performance of the EmONC signal functions.

The contrast in EmONC signal function performance between hospitals/MCH specialty centres and health centres/clinics was striking. As Figure 4.1.2 shows, more than three-fourths of hospitals/MCH speciality centres had performed each of the signal functions except for blood transfusion (65 percent). Health centres/MCH speciality clinics/higher clinics are not expected to perform blood transfusion and caesarean

section; thus, it is not surprising that only 1 percent of these facilities performed caesarean section in the 3 months preceding the survey.

Fifty-nine and 67 percent of private-for-profit facilities performed blood transfusion and caesarean section, respectively, while only about 1 percent or less of facilities in rural areas performed blood transfusion and caesarean delivery (Table 4.1.1A, page 328).

Figure 4.1.2: Percent of facilities that performed each EmONC signal function in the last 3 months, by facility type, Ethiopia EmONC, 2016

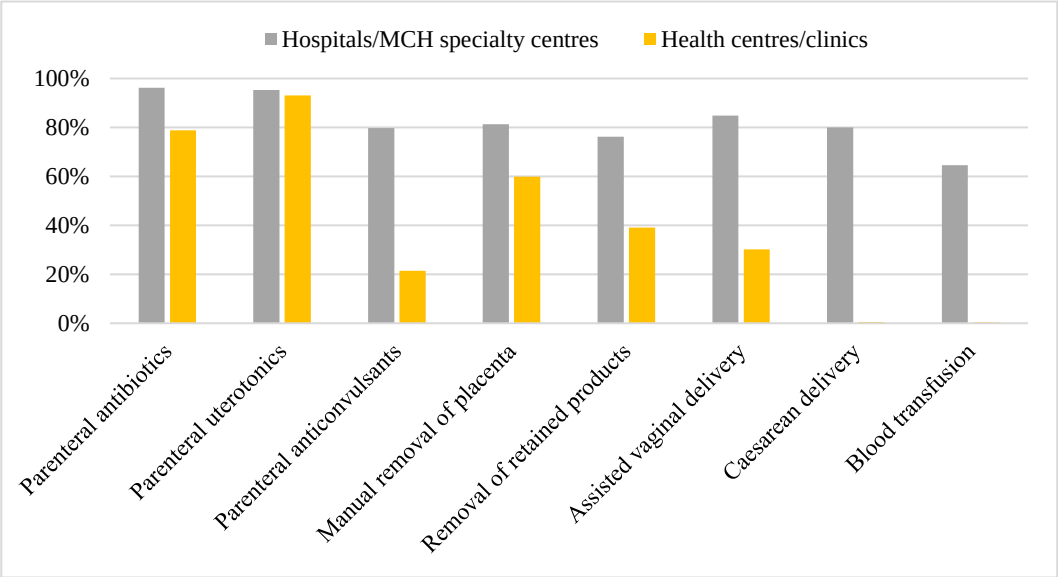


Table 4.1.2A in the Appendix on page 329 shows reasons why facilities did not provide the EmONC signal functions in the three months preceding the survey. Of the 3,804 facilities, 2,802 of the facilities (74 percent) did not perform parenteral anticonvulsants due to no indication (80 percent), followed by lack of supplies/drugs/equipment (32 percent), and training needed (6 percent). No indication means that no client had been admitted with indications that warranted, in this case, treatment with anticonvulsants.

Of the 65 percent of facilities that did not provide assisted vaginal delivery, 50 percent reported a lack of supplies/equipment/drugs and 50 percent reported no indication to perform the procedure as reasons for not providing the signal function. Eighty-eight percent of non-performing facilities also noted no indication to perform removal of retained products as a major reason for not performing the procedure.

Performance of EmNeC signal functions and reasons for non-performance

Table 4.1.3A in the Appendix on page 330, Figures 4.1.3 and 4.1.4 present the EmNeC signal functions that were performed in the three months prior to the survey, by type of facility, region, managing authority, and location. Three of the seven EmNeC signal functions were performed almost exclusively in hospital: antenatal corticosteroids, safe administration of oxygen, and IV fluids. At least 59 percent of hospitals/MCH speciality centres reported the performance of each EmNeC signal function, performance was much lower at health centres/clinics.

Figure 4.1.3: Percent of facilities that performed each EmNeC signal function in the last 3 months, Ethiopia EmONC, 2016

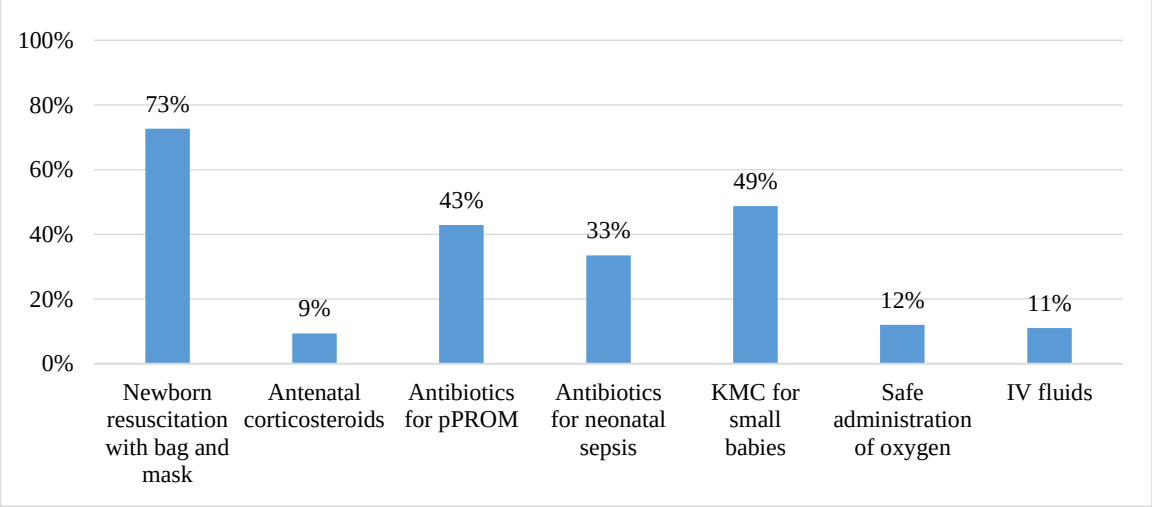
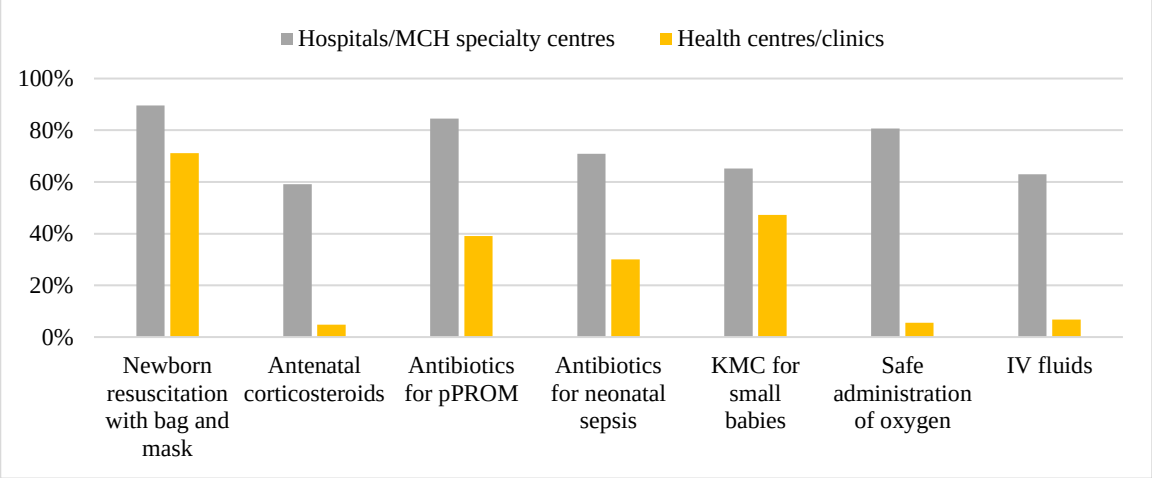


Figure 4.1.4: Percent of facilities that performed each EmNeC signal function in the last 3 months, by facility type, Ethiopia EmONC, 2016



Newborn resuscitation. Nationally, 73 percent facilities provided newborn resuscitation, the most frequently reported newborn signal function performed. Afar and Gambella were the regions with the lowest performance (42 percent and 52 percent, respectively). In contrast, 88 percent of facilities in Benishangul-Gumuz provided newborn resuscitation.

Antenatal corticosteroids. The newborn signal function with the lowest performance was antenatal corticosteroids, performed in only 9 percent of the facilities, ranging from 5 percent in Benishangul-Gumuz to 27 percent in Harari.

Antibiotics for preterm premature rupture of membranes (pPROM). Only 43 percent of facilities provided antibiotics for pPROM in the three months prior to the date of the visit. The highest performing region was Addis Ababa (81 percent) and the lowest was Afar (25 percent).

Antibiotics for neonatal sepsis. Only 1/3 of facilities provided antibiotics for neonatal sepsis: 71 percent of hospitals and 30 percent of health centres and clinics.

KMC for small babies. Forty-nine percent of facilities provided KMC for babies less than 2000 grams. There was regional variation in the provision of KMC: the highest was in Tigray (65 percent) and the lowest in Harari (20 percent).

Safe administration of oxygen. Only 12 percent of facilities administrated safe oxygen. The highest users were facilities in Addis Ababa (64 percent) and the lowest in Gambella (4 percent). Only one in 10 public facilities administrated this service while 61 percent of private-for profit did so.

IV fluids. Nationally, 11 percent of facilities provided IV fluids to newborns. Sixty-three percent of hospitals/MCH speciality centres provided IV fuids while only 7 percent of health centres/clinics did so.

Like the EmONC signal functions, facilities that did not provide the EmNeC signal functions were asked why (see the lower panel of Table 4.1.2A in the Appendix on page 329). Overwhelmingly the most common explanation for non-performance for every EmNeC signal function was the lack of an indication.

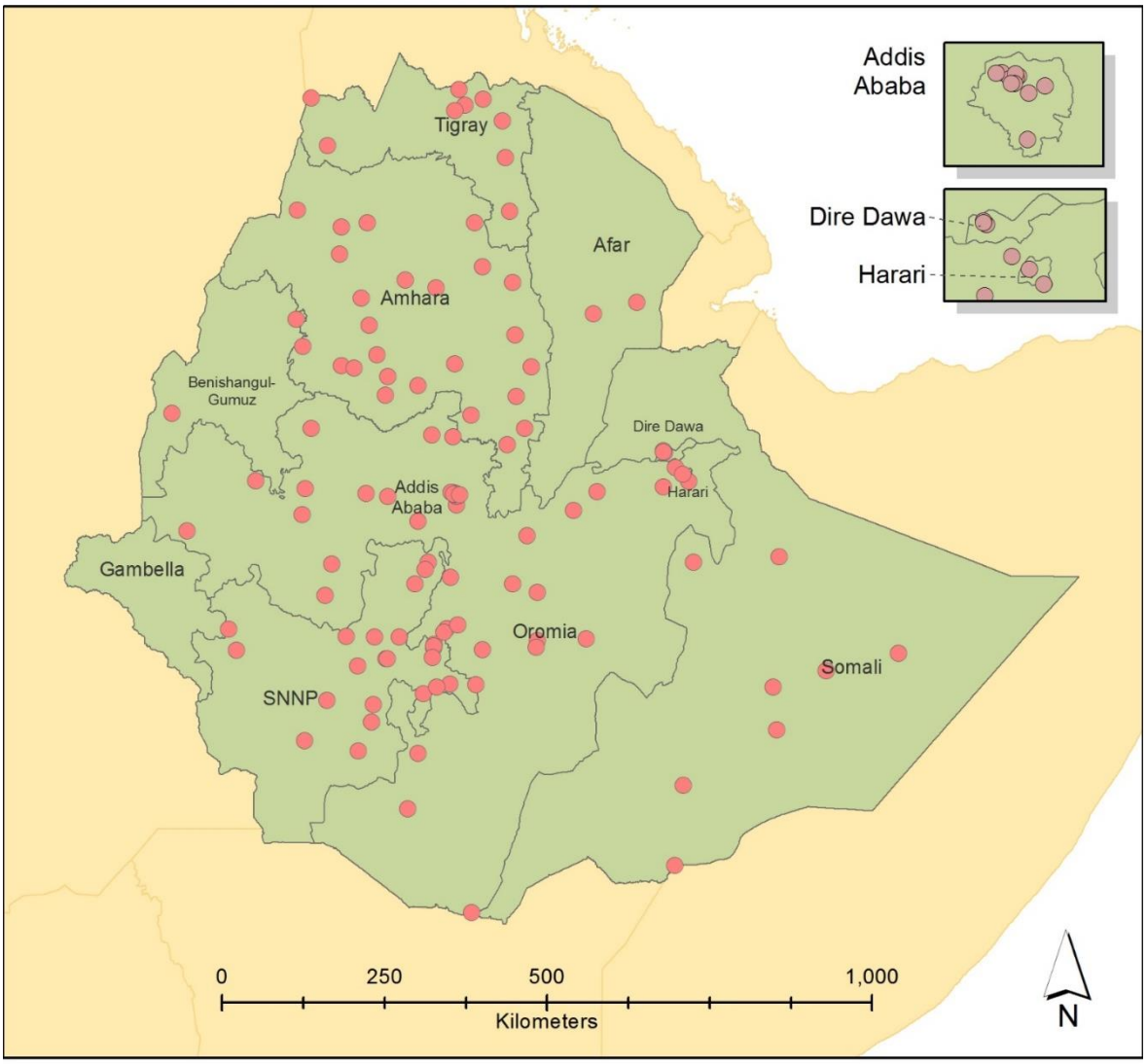
Two signal functions elicited other reasons for non-performance. Of the 91 percent of facilities that did not provide antenatal corticosteroids in the previous three months, 36 percent lacked the drugs, and 23 percent cited training issues. Twenty percent of facilities reported not providing oxygen due to lack of supplies or equipment, and 15 percent reported no IV fluid provision due to staff who needed training, 11 percent because of shortage of staff, and lack of supplies.

EmNeC status

Facilities were also categorized as fully EmNeC, partially functioning and non-EmNeC based on the performance of signal functions. If a facility performed all EmNeC signal functions it was defined as fully EmNeC, if it missed at least one signal function it was defined as partially functioning, and if it didn't provide any of the EmNeC signal functions, it was defined as non EmNeC. EmNeC status was not subdivided into basic or comprehensive since the signal functions are still in the proposal stage.

Among all assessed facilities, only 3 percent were fully EmNeC, 84 percent were partially functioning and 12 percent were non EmNeC facilities (see Figure 4.1.5 and Table 4.1.4A in the Appendix, page 331). Thirty-five percent of hospitals and specialty centres were fully functioning as EmNeC facilities but no health centres were. Regional variation in fully functioning EmNeC ranged from 14 percent in Dire Dawa to 0 percent in Gambella. No fully EmNeC facilities were found in rural areas.

Map 4.1.1: Location of Fully Functioning EmNeC Facilities



EmNeC Status

- Fully Functioning EmNeC

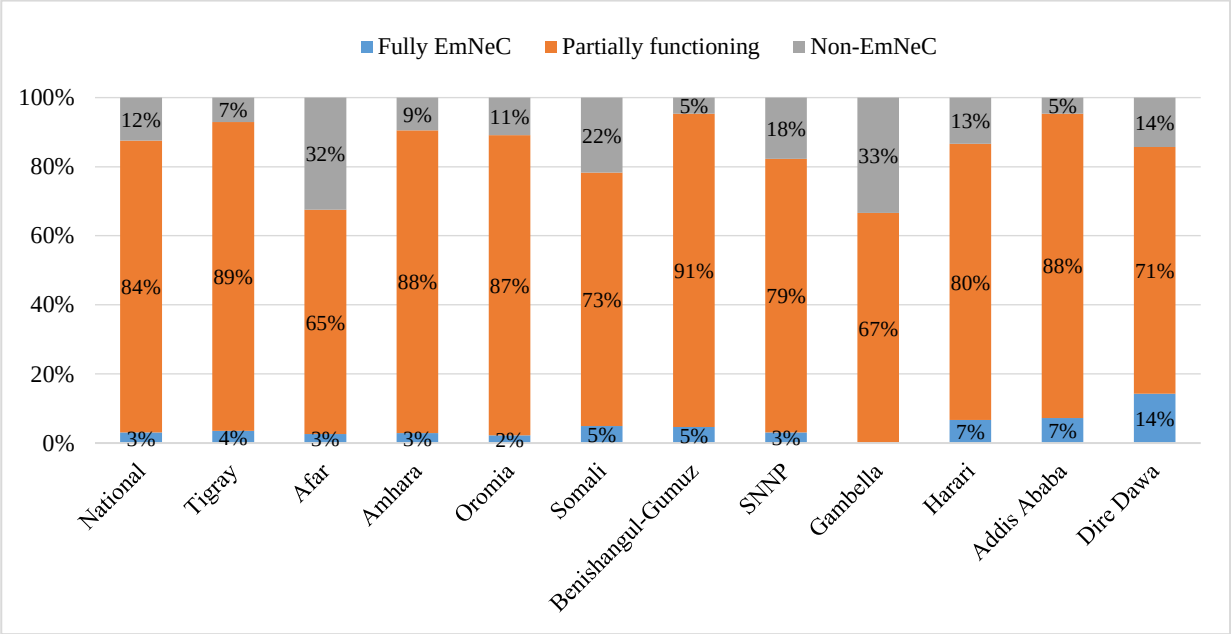
*A facility is fully EmNEC (emergency newborn care) if it has provided seven newborn services in the last three months: neonatal resuscitation, antenatal coricosteriods, antibiotics for preterm premature rupture of membranes (pPROM), antibiotics for neonatal infections, Kangaroo Mother Care (KMC), administer oxygen to newborns and IV fluid to newborns.

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Figure 4.1.5: Percent distribution of facilities according to EmNeC status, by region, Ethiopia EmONC, 2016



EmONC and EmNeC grading

If planning for upgrading, i.e., BEmONC training, equipping, and prioritization of facilities, it helps to gauge where facilities are in the process of becoming fully functioning. Tables 4.1.5A and 4.1.6A in the Appendix (pages 332 and 333) show EmONC status and EmNeC status by several levels of signal function performance, which we call "grading." Four gradations based on how many signal functions were performed are described: almost there (performed 5 or 6 signal functions), on the way (performed 3 or 4), barely functioning (performed 1 or 2), and non-functioning (no evidence of having performed any of the signal functions). Nationally, 148 facilities (4 percent) and 222 (6 percent) were fully functioning as CEmONC and BEmONC, respectively. However, the remaining 90 percent of facilities were missing one or more of the BEmONC signal functions: 31 percent of the facilities were almost there, 41 percent were on the way, 17 percent were barely functioning, and 1 percent or 39 facilities were considered non-functioning.

The availability of the two additional signal functions that pushed a facility's functioning status to CEmONC also varied by region, with the highest in Harari (20 percent) followed by Addis Ababa (10 percent), to the lowest in Amhara, Oromia, and SNNP (3 percent each). The region with the largest percentage of fully functioning BEmONC facilities was Addis Ababa (15 percent) and the regions with the lowest were Gambella, Harari, and Dire Dawa, where none of the facilities provided all the BEmONC signal functions.

Performance of 5-6 BEmONC signal functions was observed in 40 percent of the facilities in Benishangul-Gumuz, 39 percent in Amhara, and 38 percent in Tigray. In contrast, only 7 percent of facilities in Gambella were considered almost there (performing 5-6 signal functions).

Among the hospitals and MCH specialty centres, 45 percent were fully functioning as CEmONC, 14 percent as BEmONC (missing either blood transfusion or caesarean surgery capacity), and 28 percent missing 1-2 basic signal functions. These two categories might be considered "low-hanging fruit" for targeted upgrading. The 4 hospitals or centres that presumably performed no signal functions were sites with special circumstances; they either had halted services in the 3 months prior to the facility visit, or they were just beginning to provide services, or there were obstacles to examining the records and data were not available. Health centres and clinics included 6 functioning as CEmONC, 5 percent as BEmONC, 32 percent had provided 5-6 signal functions, and 44 percent only 3 or 4 signal functions.

Differences across managing authority were noted that reflect the type of facilities represented in each category: 18 percent of the private-for-profit facilities functioned as CEmONC and 14 percent of private-not-for-profit facilities did so. Only 3 percent of the public/government facilities did so. Urban facilities were more highly performing than rural facilities.

A total of 116 facilities (3 percent) were fully functioning as EmNeC facilities. While 41 percent of facilities were fully functioning or "almost there" for EmONC, only 9 percent met these criteria for EmNeC functioning. Among the remaining facilities, 31 percent were on the way (with 3-4 signal functions) and 48 percent barely functioning (only 1-2 signal functions). The region with the largest percentage of fully functioning or "almost there" facilities was Addis Ababa (29 percent) and the poorest performance was found in Gambella (4 percent of facilities).

In 69 percent of hospitals and MCH centres between 5 and 7 of the EmNeC signal functions were performed compared to only 4 percent of health centres and clinics. Again, private-for-profit and not-for-profit facilities outperformed the public sector, as did urban versus rural facilities.

4.2 Readiness to perform the signal functions and routine delivery

To better understand non-performance of the signal functions, it is helpful to look at the facility's readiness to perform each signal function. Facility readiness is defined by the availability of at least one cadre on staff who can provide the signal function and the availability of a minimum package of supplies, drugs, and equipment. See Appendix B for definitions and source documents of those minimum packages. Information on performance of signal functions, readiness on human resources, and readiness in equipment/ drugs/ supplies came from Module 5, Module 2, and Module 3, respectively.

EmONC signal functions

Appendix Table 4.2.1A on page 334 and Figure 4.2.1 show the percent of all facilities that were 'ready' to provide each signal function, first at the national level with all facilities included in the assessment, and then disaggregated by higher-level facilities (hospitals/MCH specialty centres) and mid-level facilities (health centres/MCH specialty/higher clinics). For comparison, the table also displays the percentage of facilities that recently performed each signal function.

In general facilities appeared to be better staffed than they were equipped with drugs, supplies or equipment, or they were very similar. For the most part, national figures for EmONC facility readiness (supplied and staffed) were good. Among the 7 basic signal functions, facilities were the least ready to provide removal

of retained products (38 percent) and AVD (49 percent). Of all 9 signal functions, facilities were the least ready to perform blood transfusion (4 percent) and caesarean delivery (6 percent).

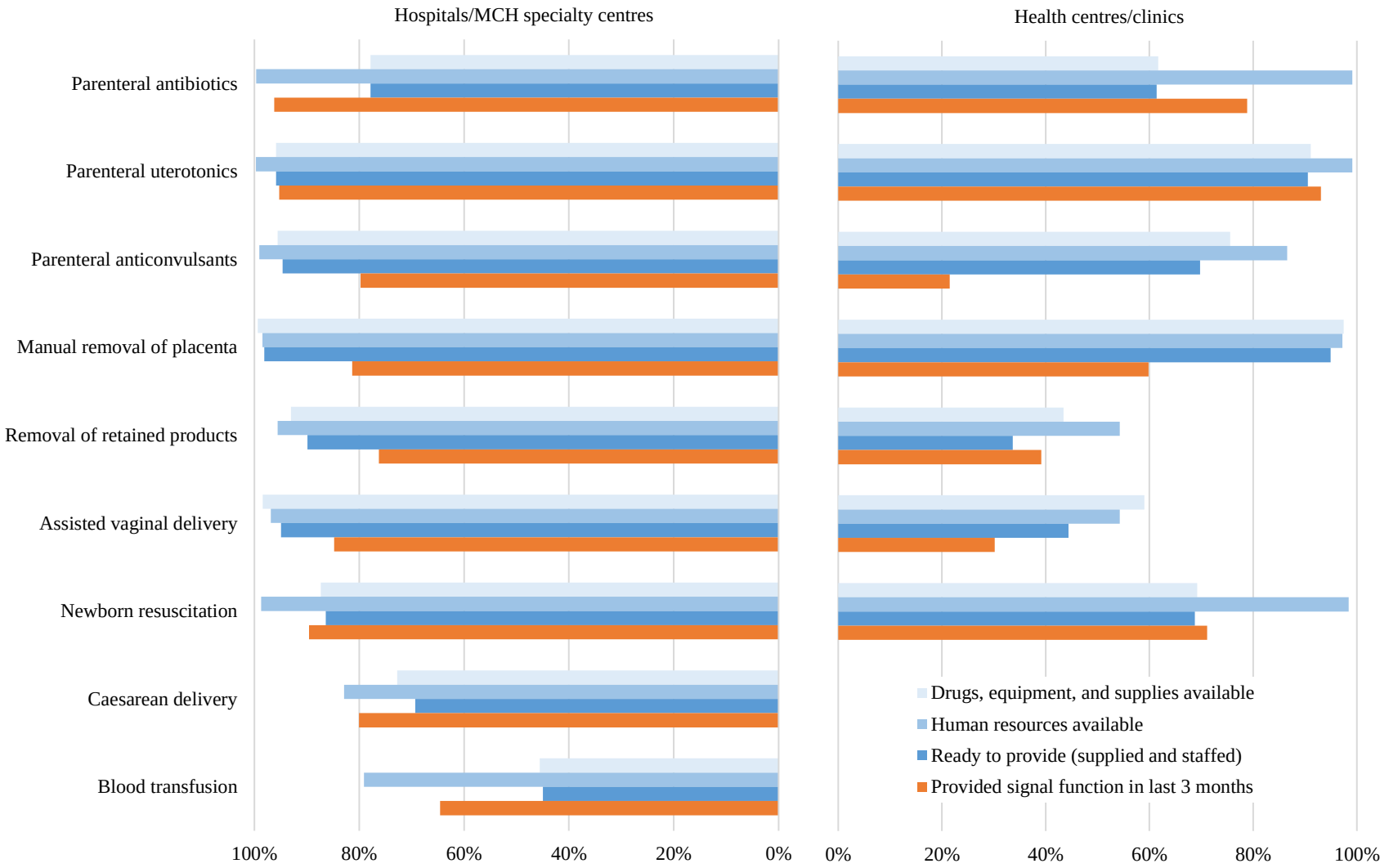
Disparities were observed between higher- and mid-level facilities for all EmONC signal functions but especially removal of retained products and AVD, with markedly lower levels of both human resources and drugs, equipment, and supplies for each in mid-level facilities. These findings raise concerns if all mid-level facilities should be ready to provide these two signal functions.

Low facility readiness for blood transfusion among higher-level facilities appears to have been driven by the limited availability of drugs, equipment, and supplies. Whereas 79 percent of these facilities reported having a health worker cadre who could provide blood transfusion, only 46 percent had the required package of drugs, equipment, and supplies. This finding is worrisome given the expectation that hospitals and MCH specialty centres should be able to provide blood transfusions.

The findings from this analysis also highlight the contrast between facility readiness for the administration of anticonvulsants (72 percent nationally) and the actual provision of parenteral anticonvulsants (26 percent nationally). Both the human resources and the drugs, equipment, and supplies required for administering anticonvulsants were available in most mid- and higher-level facilities, however, only 22 percent of mid-level facilities provided this service (as compared to 80 percent of higher-level facilities). This suggests that providers at mid-level facilities may be lacking skills or confidence to diagnose or to treat, rather than drug or supply availability being responsible for the low levels of anticonvulsant use observed. It could also mean that women with signs or symptoms of severe pre-eclampsia and eclampsia went directly to higher level facilities, by-passing health centres and clinics.

Sometimes facility readiness was, incongruously, lower than the provision of a signal function, for example, at the national level only 63 percent of facilities were ready to provide antibiotics, and yet 80 percent of these facilities reported having provided antibiotics in the 3-month reference period. One explanation for this discrepancy is that some signal functions were performed under sub-optimal conditions, either by inappropriate cadres, or staff used antibiotics that were not recommended in national guidelines (i.e. a quality of care issue or a problem of logistics). It is also possible that human resources, drugs, equipment, or supplies were absent on the day of the survey, but were available at some other point in the preceding three months, at which time the signal function was performed (i.e. a timing issue). It seems unlikely that the latter explanation could account for the larger discrepancies between readiness and service provision (antibiotics, caesarean delivery, and blood transfusion), and therefore these findings suggest there may be room for improvement in the quality of service provision for these signal functions.

Figure 4.2.1: Percent of facilities that are ready to provide and currently provide each EmONC signal function, by facility type, Ethiopia EmONC, 2016



EmNeC signal functions

The same readiness analysis was performed for the proposed EmNeC signal functions. As with EmONC readiness, EmNeC readiness is defined by: (1) the availability of at least one cadre that can provide the signal function, and (2) the availability (and if applicable, functionality) of a minimum package of drugs, equipment, and supplies required for the signal function (see Appendix B). Table 4.2.2A in the Appendix (page 335) and Figure 4.2.2 show the percent of facilities that were 'ready' to provide each EmNeC signal function, and for comparison, the percentage of facilities that recently performed each signal function. Note that resuscitation of the newborn with bag and mask appears among both EmONC and EmNeC signal functions.

National figures for EmNeC facility readiness (supplied and staffed) for newborn resuscitation and antibiotics for pPROM were encouraging, 70 percent and 68 percent, respectively. At the national level, readiness for other EmNeC signal functions was lower, with readiness for antenatal corticosteroids, oxygen administration to newborns, and IV fluids for newborns quite low (22, 16, and 29 percent, respectively).

There were disparities by facility type, with higher-level facilities substantially more likely to be equipped and staffed for the EmNeC signal functions than mid-level facilities. For example, just over three-quarters of higher-level facilities were ready to provide antibiotics for newborn infections, while slightly more than half of mid-level facilities were. It is worth noting that the availability of human resources to provide EmNeC signal functions was above 85 percent for all EmNeC signal functions in higher-level facilities, and above 81 percent for four of the seven EmNeC signal functions (newborn resuscitation, antibiotics for pPROM, antibiotics for newborn sepsis, and KMC in mid-level facilities. In mid-level facilities, both human resources and supplies appeared to limit their readiness to provide antenatal corticosteroids, oxygen and IV fluids.

Readiness to provide KMC was quite low among all facilities (45 percent), and appeared to be driven by a lack of required equipment; however, the minimum requirements are few – KMC guidelines and a postnatal or designated-KMC bed.

Different from the EmONC signal functions, in most cases provision of the EmNeC signal functions did not appear to commonly occur in facilities that were not staffed and equipped to do so. Where provision of the signal function was higher than readiness, the difference was sufficiently small as to perhaps be explained by the timing issue (described above).

Figure 4.2.2: Percent of facilities that are ready to provide and currently provide each EmNeC signal function, by facility type, Ethiopia EmONC, 2016

Routine delivery

This assessment was the first to include an expanded set of indicators related to routine delivery provision and quality. To differentiate routine delivery from other service lines, for example, emergency services or ANC, we focused routine delivery readiness on items typically required during the intrapartum and immediate postpartum periods. This section discusses availability of the key items which are organized into seven domains: infrastructure, respectful maternity care, infection prevention and control, human resources, drugs, equipment and supplies, and diagnostics. (Availability of many of these items are also presented in later chapters). We also present the results of a composite measure of readiness for each domain, and overall. The composite indicator was calculated by awarding each facility one point for each item present in the facility. Figure 4.2.3 presents the average facility score for each domain (maximum score for any domain is 10) and the average overall readiness score (maximum possible score is 70), by facility type, managing authority and region. Tables 4.2.3, 4.2.4 and 4.2.5 present the percentage of facilities that have each of the individual items included in the composite indicator.

Overall, facilities scored just 46.0 out of 70 possible points in routine delivery readiness (Figure 4.2.3). Facilities were most prepared in infection prevention (8.4 out of 10), and least prepared in terms of diagnostics (5.2 out of 10), followed closely by infrastructure (5.4) and drugs (5.6). In general, hospitals scored substantially better than health centres/clinics (54.0 out of 70 vs. 45.3).

Regarding differences across managing authority, private not-for-profit and for-profit facilities scored similarly, and higher than public/government facilities. The higher score in private-for-profit facilities was driven by their substantially higher score in the diagnostics domain (7.9 in for-profit vs. 6.6 in not-for-profit and 5.1 in public facilities), despite low scores in respectful maternity care (5.2) and drugs (5.6). The low score in drugs among private-for-profit facilities was driven by the low percentage of these facilities with tetanus toxoid in stock (51 percent), and oxytocin in stock, refrigerated and monitored (58 percent) (Table 4.2.5). Public facilities scored higher than other sectors in human resources and respectful care, the latter was largely driven by the widespread implementation in government facilities of free maternity services (Table 4.2.3). The higher human resource score among public facilities was driven by relatively high percentages of public facilities with providers available and trained to complete the partograph and with better knowledge scores on steps of AMTSL (Table 4.2.4).

Regions with the highest overall readiness for routine delivery included Dire Dawa, Addis Ababa, Harari and Tigray; all had an overall score greater than 50 out of 70. While these regions scored higher than others, there remains room for substantial improvement. Gambella and Somali had the lowest scores (40.5 and 39.9, respectively), followed closely by Afar (42.8). All regions scored relatively high in infection prevention (scores ranged from 7.1 in Gambella to 9.7 in Dire Dawa); but, other than Addis Ababa and Benishangul-Gumuz, all regions scored relatively low in infrastructure required for routine delivery (scores ranged from 4.4 in Gambella to 6.5 in Harari). As mentioned before, scores for drugs and diagnostics were low overall, and this low score was reflected across most regions, though Tigray scored relatively high in drugs (7.2), and Harari and Dire Dawa scored 8.0 or higher in diagnostics. Relative to other regions, Somali stood out with a very low score of 5.8 in human resources, and 4.7 in drugs.

Figure 4.2.3: Facility readiness to provide routine delivery services, by facility type, managing authority, and region, Ethiopia EmONC, 2016

Table 4.2.3: Percent of facilities with critical infrastructure and aspects of respectful maternity care required for routine delivery services, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	Total	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=3,804	n=316	n=3,488	n=3,662	n=83	n=59
Infrastructure						
Provides obstetric care 24/7	99%	99%	99%	100%	98%	95%
Provides newborn care 24/7	98%	97%	98%	98%	89%	95%
Reliable source of electricity available at facility[3]	17%	43%	15%	16%	43%	47%
Electricity functioning in L&D	66%	97%	64%	65%	95%	92%
Sufficient light for work during day and at night in L&D	66%	91%	64%	65%	96%	90%
Facility has water from an improved source within 500 meters for infection prevention and staff use	64%	93%	61%	63%	93%	90%
Functioning water in L&D	43%	87%	39%	41%	89%	85%
Functioning toilet for client use in L&D	80%	90%	79%	79%	96%	95%
At least 1 mode of functional communication on-site	36%	86%	31%	34%	95%	68%
At least 1 mode of functional motorized transport	34%	84%	29%	32%	82%	71%
Sufficient fuel available today to transport women and newborns if needed	26%	77%	21%	24%	77%	69%
Computer with internet access	6%	48%	3%	5%	41%	31%
L&D register complete and up-to-date	32%	43%	31%	32%	25%	47%
Guidelines on integrated management for pregnancy, childbirth, postpartum, and newborn care (focus on routine care) visible	57%	69%	56%	57%	63%	53%
Ratio of obstetric beds to deliveries meets standard[4]	89%	91%	89%	89%	95%	93%
Respectful maternity care						
Financial accessibility						
Fee schedule for services posted in visible, public place	38%	45%	37%	37%	51%	51%
No cost for normal delivery[5]	97%	77%	99%	99%	7%	63%
No card fee[5]	94%	72%	96%	97%	1%	54%
No cost for oxytocin[5]	96%	78%	97%	98%	19%	66%
Supportive environment						
Average length of stay after normal delivery is at least 24 hours	40%	20%	42%	41%	14%	25%
Woman can choose a companion of her choice during delivery	76%	68%	77%	76%	59%	76%
Woman can walk around during labour	97%	97%	97%	97%	92%	95%
Woman can choose position during labour/delivery	63%	64%	63%	64%	53%	51%
Curtains for client privacy	83%	92%	82%	83%	99%	91%
Waiting area for visitors and family (in facility)	79%	90%	78%	79%	94%	95%
Functioning toilet for visitors and family use in L&D	79%	90%	78%	79%	96%	95%
Food is provided to clients by facility	49%	54%	49%	50%	24%	32%

	Total	Facility type		Managing authority		
		Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=3,804	n=316	n=3,488	n=3,662	n=83	n=59
Adequate space: In last 3 months,						
Delivery clients have never shared beds before or after delivery	91%	90%	91%	90%	95%	91%
Delivery clients have never slept on the floor	91%	86%	92%	91%	95%	98%
Delivery clients have never delivered on the floor	94%	91%	95%	94%	95%	95%

L&D = labour and delivery area.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Connected to central electrical supply (with or without secondary source) or with solar system and backup, and fewer than 2 hours of interrupted supply in last 7 days.

[4] International standards stipulate 6-8 labour and delivery beds for every 1,000 deliveries for a first-level referral facility, such as a district hospital. (Source: Essential elements of obstetric care at first referral level. Geneva, Switzerland: World Health Organization, 1991.) The ratio should be calculated using the number of institutional deliveries as the denominator (in conformity with the formula for international standards), not the number of expected births.

[5] Maternity services are exempted services and all facilities should provide them free of charge. (Source: Ethiopia's progress in health financing and the contribution of the 1998 health care and financing strategy in Ethiopia. Alebachew A, Yusuf Y, Mann C, Berman P. Harvard TH Chan School of Public Health and Breakthrough International Consultancy, PLC. 2015.)

Table 4.2.4: Percent of facilities with critical infection prevention items and human resources required for routine delivery services, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	Total	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=3,804	n=316	n=3,488	n=3,662	n=83	n=59
Infection prevention						
Chlorhexidine, ethanol, polyvidone iodine, or alcohol-based rub	98%	100%	98%	98%	100%	98%
Functioning autoclave or hot air sterilizer	59%	89%	56%	58%	94%	76%
Disposable latex examination gloves	97%	99%	97%	97%	100%	98%
Non-sterile protective clothing	85%	98%	84%	85%	100%	95%
No liquid spills or trash observed on floors in L&D	79%	82%	79%	79%	87%	90%
Covered contaminated waste trash bin in L&D	62%	84%	60%	62%	82%	90%
Prepared disinfection solution in L&D	91%	98%	90%	91%	95%	98%
Puncture proof sharps container in L&D	96%	99%	96%	96%	95%	97%
Soap in L&D	86%	96%	86%	86%	99%	97%
Placenta pit	92%	98%	91%	91%	96%	98%
Functioning incinerator	82%	95%	81%	82%	90%	92%
Human resources						
Skilled birth attendant on duty 24/7[3]	99%	100%	99%	99%	100%	100%
At least one provider that can attend normal delivery	100%	98%	100%	100%	98%	100%
At least one provider that can fill out and use partograph	90%	94%	90%	91%	80%	86%
At least one provider that can provide immediate newborn care	100%	99%	100%	100%	100%	100%
Interviewed provider received training on partograph use	84%	87%	84%	84%	78%	73%
Interviewed provider received training on AMTSL	84%	85%	84%	84%	81%	73%
Interviewed provider indicated correct timing of first bath for newborn (24 hours)	96%	92%	95%	96%	76%	88%
Interviewed provider scored 75+ (out of 100) on knowledge of:[4]						
Admission and referral requirement before onset of labour	4%	9%	3%	4%	8%	5%
Observations to monitor labour progress	49%	61%	48%	50%	34%	42%
Steps of AMSTL	77%	84%	76%	77%	69%	71%
Immediate newborn care	40%	47%	39%	40%	34%	42%
Key counselling messages for cord care	5%	6%	5%	5%	10%	10%

AMSTL = active management of the third stage of labour; L&D = labour and delivery area.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] SBA (skilled birth attendant): general practitioner, obstetrician/gynaecologist, midwife, health officer, or nurse.

[4] Facility is given a point in the composite index if the average knowledge score of provider interviewed is 75 points or higher on indicated topics.

Table 4.2.5: Percent of facilities with critical drugs, equipment/supplies, and diagnostics required for routine delivery services, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	Total	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=3,804	n=316	n=3,488	n=3,662	n=83	n=59
Drugs[3]						
IV fluids (dextrose, normal saline, or ringers lactate)	98%	99%	98%	98%	80%	98%
Morphine	6%	31%	3%	5%	25%	15%
ARVs for baby	44%	84%	40%	43%	65%	51%
ARVs for mother	44%	86%	40%	44%	66%	51%
Anti-tetanus serum/TAT	58%	77%	56%	58%	57%	73%
Tetanus toxoid vaccine	89%	80%	90%	90%	51%	86%
Anti-rho (D) immune globulin	9%	36%	7%	9%	19%	22%
Oxytocin in stock and observed to be refrigerated and monitored, on day of survey	71%	76%	70%	71%	58%	83%
No stock out of oxytocin in last 3 months	83%	85%	83%	84%	72%	86%
Equipment and supplies						
Partograph form[4]	83%	93%	82%	82%	81%	85%
Partograph used in the last 3 months	80%	89%	79%	81%	58%	83%
Suture needles/suture materials[4]	97%	97%	97%	97%	94%	97%
Blood pressure cuff[5]	94%	98%	94%	94%	100%	95%
Thermometer (clinical)[4]	92%	99%	92%	92%	100%	98%
Stethoscope (for adult)[4]	98%	100%	98%	98%	100%	98%
Stethoscope (for foetus)[4]	92%	98%	92%	92%	100%	95%
Baby weighing scale	98%	100%	98%	98%	100%	100%
Towels/blankets or cloth for newborn	29%	63%	26%	27%	81%	66%
Tetracycline eye ointment/drops[3]	81%	89%	80%	81%	78%	93%
Cup for breast milk expression	33%	59%	31%	32%	55%	47%
Alternative feeding to babies provided in last 3 months	23%	65%	19%	22%	53%	39%
Chlorhexidine (4% gel) in pharmacy, maternity or newborn care unit[5]	19%	35%	18%	18%	40%	29%
Staff routinely applies chlorhexidine to newborn's cord stump	11%	12%	10%	11%	8%	15%
Thermometer for newborn	55%	76%	53%	54%	82%	85%
Diagnostics						
Dipstick for urinalysis[4]	55%	83%	53%	54%	89%	88%
HIV RDT kit[4]	75%	79%	75%	75%	83%	68%
Haemoglobinometer and hydrochloric acid solution[6]	35%	56%	33%	34%	78%	66%
Malaria (RDT kit with microscope)[6]	44%	30%	45%	44%	51%	32%
Syphilis test[6]	51%	89%	48%	50%	95%	75%

ARVs = antiretrovirals (Option B+ regimen); RDT = rapid diagnostic test; TAT = tetanus anti-toxin.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Unless otherwise noted, if a facility reported neither a pharmacy nor a supply of medicines, that facility was assumed not to have the drug. Missing information was also taken as not having the drug.

[4] Assessed in the maternity area. For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

[5] These results do not match availability of chlorhexidine gel (4%) presented elsewhere because here we consider the drug available if it is was present in any of the three areas indicated.

[6] Results presented out of all facilities; though, questions were not asked of facilities who indicated they did not have a laboratory.

4.3 Choices regarding drugs and equipment for performing the signal functions

In medicine, more than one drug or one piece of equipment can be used to provide life-saving services. Although the choice is often set by national guidelines and/or by individual providers' preferences or skill levels, special situations may make one selection better than another.

Parenteral uterotonics. Table 4.3.1 shows facilities that administered parenteral uterotonics, and of those, 72 percent administered oxytocin only. Although oxytocin is the drug of choice, 2 percent of the facilities administered ergometrine only, and the remaining 26 percent administered both. Regional variation ranged from 91 percent of facilities in Tigray that administered oxytocin exclusively, to Addis Ababa where only 49 percent of the facilities used oxytocin exclusively and 51 percent used both.

Additional questions investigated the obstetric or gynaecological indications for which health workers administered uterotonics. Among facilities that used oxytocin, 18 percent used it to induce or augment labour: 73 percent of hospitals and MCH specialty clinics and 13 percent of health centres and clinics. Seventy-six percent of private-for-profit facilities used oxytocin to induce or augment labour compared to 17 percent of government facilities.

Among the 3,547 facilities that had used parenteral uterotonics in the last three months, usage to prevent PPH was high (89 percent of facilities). Three regions reported that 90 percent or more of their facilities used parenteral uterotonics for PPH prevention: Tigray, Addis Ababa, and Dire Dawa. The regions with the lowest facility use were Afar (77 percent), Somali (75 percent), and Gambella (71 percent). Differences among facility type, managing authority or urban rural location were slight. About half (49 percent) of the facilities that had used parenteral uterotonics used them to treat PPH; regional usage rates ranged from 24 percent in Gambella to 75 percent of facilities in Benishangul-Gumuz. Hospitals and specialty centres were more likely to use uterotonics to treat PPH than health centres and clinics. Interestingly, 80 percent of private-for-profit facilities treated PPH with uterotonics compared to only 48 percent of government facilities.

Table 4.3.1: Percent distribution of facilities that administered parenteral uterotonics in the last 3 months according to type of oxytocic used, and percent that used according to clinical indication, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that administered parenteral uterotonics in the last 3 months	Among facilities that administered parenteral uterotonics in the last 3 months, percent that used:			Among facilities that administered parenteral uterotonics in the last 3 months, reason for use:		
		Oxytocin only	Ergometrine only	Both[1]	Induction of labour/ augmentation (oxytocin only)[2]	Prevention of PPH	Treatment of PPH
National	3,547	72%	2%	26%	18%	89%	49%
Region							
Tigray	247	91%	0%	8%	20%	97%	44%
Afar	48	77%	8%	15%	27%	77%	63%
Amhara	826	71%	1%	27%	16%	88%	52%
Oromia	1,338	68%	2%	30%	15%	89%	47%
Somali	136	76%	1%	21%	50%	75%	65%
Benishangul-Gumuz	40	58%	3%	40%	5%	85%	75%
SNNP	714	78%	2%	20%	17%	88%	44%
Gambella	21	90%	5%	5%	35%	71%	24%
Harari	15	60%	0%	40%	40%	80%	53%
Addis Ababa	142	49%	1%	51%	38%	94%	66%
Dire Dawa	20	75%	0%	25%	15%	90%	50%
Facility type							
Hospitals/MCH specialty centres	301	38%	0%	61%	73%	91%	77%
Health centres/clinics[3]	3,246	75%	2%	23%	13%	88%	47%
Managing authority							
Public/government	3,419	73%	1%	25%	17%	88%	48%
Private-for-profit	73	34%	1%	63%	76%	90%	80%
Private-not-for-profit[4]	55	60%	4%	36%	32%	89%	58%
Location							
Urban	1,404	64%	1%	35%	26%	91%	56%
Rural	2,143	78%	2%	20%	13%	87%	45%

[1] One private-for-profit facility in Somali region provided misoprostol in the last 3 months.

[2] Excludes facilities that used ergometrine only.

[3] Includes MCH specialty clinics and higher clinics.

[4] Includes NGO, faith-based, or mission facilities.

Misoprostol for obstetric and gynaecological indications. Regardless of whether a facility responded yes or no to the question about parenteral uterotonics in the last three months, each facility answered whether it used misoprostol for obstetric or gynaecological indications (Table 4.3.2). Thirty percent responded affirmatively. Regional responses varied from 80-81 percent of facilities in Harari and Dire Dawa to 4 percent of facilities in Gambella (only 1 facility). Hospitals were almost four times as likely to use misoprostol as health centres, while 80 percent of private-for-profit facilities used misoprostol compared to 29 percent of government facilities. Finally, the percentage of urban facilities to report using misiprostol was more than twice that of rural facilities.

Table 4.3.2: Percent of facilities that used misoprostol for ob/gyn indications, and among those, clinical indication for use, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Percent of facilities that used misoprostol	Number of facilities that used misoprostol	Among facilities that used misoprostol for ob/gyn indications, percent that used it for:				
				Induction of labour	Prevention of PPH	Treatment of PPH	Treatment of incomplete abortion	Terminate pregnancy
National	3,804	30%	1,150	19%	41%	37%	55%	57%
Region								
Tigray	255	37%	94	23%	40%	29%	56%	78%
Afar	77	25%	19	32%	53%	32%	47%	32%
Amhara	876	28%	244	19%	36%	37%	51%	64%
Oromia	1,405	26%	364	14%	35%	35%	61%	55%
Somali	161	13%	21	81%	81%	86%	81%	52%
Benishangul-Gumuz	43	37%	16	13%	19%	31%	56%	69%
SNNP	773	37%	284	17%	52%	37%	43%	45%
Gambella	27	4%	1	0%	0%	0%	100%	0%
Harari	15	80%	12	17%	17%	8%	83%	42%
Addis Ababa	151	52%	78	26%	50%	47%	64%	65%
Dire Dawa	21	81%	17	6%	6%	12%	59%	65%
Facility type								
Hospitals/MCH specialty centres	316	80%	253	57%	57%	61%	70%	69%
Health centres/clinics[1]	3,488	26%	897	8%	36%	30%	50%	53%
Managing authority								
Public/government	3,662	29%	1,060	17%	39%	34%	54%	56%
Private-for-profit	83	78%	65	39%	62%	62%	69%	69%
Private-not-for-profit[2]	59	42%	25	40%	52%	64%	60%	52%
Location								
Urban	1,497	47%	698	24%	40%	38%	61%	66%
Rural	2,307	20%	452	11%	43%	34%	45%	42%

[1] Includes MCH specialty clinics and higher clinics [2] Includes NGO, faith-based, or mission facilities.

Among facilities that reported using misoprostol for ob/gyn indications, 57 percent reported using it to terminate pregnancies while 55 percent used it to treat incomplete abortions. Forty-one percent of facilities used misoprostol to prevent PPH and 37 percent to treat PPH. As many as 19 percent of facilities used misoprostol to induce or augment labour (the same percentage of facilities that reported using parenteral oxytocin to induce or augment labour). Variation by type of facility and managing authority resembled the patterns of parenteral uterotonics, but in rural areas slightly more facilities used misoprostol than urban facilities to prevent PPH. Although relatively few facilities in Somali reported using misoprostol, those that did reported high rates of use (more than 80 percent) for all indications but pregnancy termination, raising the possibility of higher than average stock out rates of oxytocin in Somali facilities.

Parenteral anticonvulsants. Magnesium sulphate is the drug of choice to prevent convulsions among women with severe pre-eclampsia and to treat convulsions when they occur. Table 4.3.3 shows that among the 1,002 facilities that administered anticonvulsants in the three months preceding the facility visit, 55 percent used magnesium sulphate only, 29 percent used diazepam only, and the remaining 15 percent administered both. In Benishangul-Gumuz and Addis Ababa, the percents of facilities using only magnesium sulphate or only diazepam were the same; in other regions, the drug of choice was clearly magnesium sulphate. It appears that health centres/clinics administered diazepam only (35 percent) three times as frequently as hospitals/MCH speciality centres (12 percent). Moreover, half of private-for-profit facilities only administered diazepam. This suggests that these providers could improve compliance with guidelines that promote magnesium sulphate as the drug of choice.

Table 4.3.3: Percent distribution of facilities that administered parenteral anticonvulsants in the last 3 months according to type of medication used, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that administered parenteral anticonvulsants in the last 3 months	Among facilities that administered parenteral anticonvulsants in the last 3 months, percent that used:		
		Magnesium sulphate only	Diazepam only	Both
National	1,002	55%	29%	15%
Region				
Tigray	105	84%	7%	10%
Afar	12	75%	0%	25%
Amhara	257	63%	25%	12%
Oromia	325	45%	41%	14%
Somali	72	50%	24%	26%
Benishangul-Gumuz	14	43%	43%	14%
SNNP	128	51%	30%	20%
Gambella	3	67%	33%	0%
Harari	4	75%	0%	25%
Addis Ababa	77	38%	39%	23%
Dire Dawa	5	100%	0%	0%
Facility type				
Hospitals/MCH specialty centres	252	59%	12%	29%
Health centres/clinics[1]	750	54%	35%	11%
Managing authority				
Public/government	935	56%	29%	15%
Private-for-profit	44	30%	50%	20%
Private-not-for-profit[2]	23	48%	17%	35%
Location				
Urban	555	57%	23%	19%
Rural	447	52%	37%	11%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Removal of retained products. Table 4.3.4 shows the different techniques of removing retained products: manual vacuum aspiration (MVA), electric vacuum aspiration, dilation and curettage (D&C), evacuation and curettage (E&C), misoprostol, and oxytocin. Nationally, nearly half of the facilities that performed removal of retained products of conception used MVA and 54 percent used oxytocin. All seven health facilities in Harari that performed removal of retained products in the three months prior to the survey used MVA; the lowest percentage of facilities using MVA was in SNNP (41 percent). In addition, most of the facilities in Somali region (73 percent) used oxytocin followed by Benishangul-Gumuz (65 percent), and Oromia (58 percent) compared to only 8 percent in Dire Dawa. There was also variation in the use of

MVA by facility type in which 74 percent of the hospitals/ MCH speciality centres used MVA compared with 44 percent of health centres. Eighty-five percent of the private-for-profit facilities and 58 percent of the facilities in urban areas also used MVA to remove retained products.

Table 4.3.4: Percent of facilities that removed retained products in the last 3 months according to method used, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that removed retained products in the last 3 months	Among facilities that removed retained products in the last 3 months, percent that used: (multiple responses allowed)					
		Manual vacuum aspiration (MVA)	Electric vacuum aspiration	D&C	E&C	Misoprostol	Oxytocin
National	1,606	49%	4%	7%	8%	16%	54%
Region							
Tigray	117	73%	2%	6%	9%	20%	44%
Afar	24	83%	13%	25%	13%	25%	46%
Amhara	426	49%	3%	3%	6%	11%	50%
Oromia	605	43%	2%	6%	7%	13%	58%
Somali	51	47%	14%	18%	16%	25%	73%
Benishangul-Gumuz	23	43%	0%	4%	4%	13%	65%
SNNP	252	41%	6%	9%	9%	22%	54%
Gambella	4	50%	0%	0%	0%	0%	50%
Harari	7	100%	14%	29%	29%	43%	29%
Addis Ababa	85	59%	9%	15%	16%	27%	53%
Dire Dawa	12	83%	0%	8%	8%	50%	8%
Facility type							
Hospitals/MCH specialty centres	241	74%	18%	33%	33%	42%	62%
Health centres/clinics[1]	1,365	44%	1%	2%	3%	11%	52%
Managing authority							
Public/government	1,539	47%	3%	6%	7%	14%	54%
Private-for-profit	39	85%	18%	33%	28%	59%	51%
Private-not-for-profit[2]	28	68%	29%	32%	25%	32%	71%
Location							
Urban	836	58%	6%	11%	12%	22%	53%
Rural	770	39%	1%	2%	3%	9%	55%

D&C = dilation and curettage; E&C = evacuation and curettage.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Assisted vaginal delivery. Table 4.3.5 shows the use of a vacuum extractor, forceps or both instruments for assisted vaginal deliveries. Of the 1,321 facilities that performed AVD in the three months prior to the survey, 86 percent used vacuum extraction only, three percent used forceps only, and 11 percent used both methods. Unlike forceps delivery, vacuum extraction was used in nearly nine in ten public or government facilities. A larger percentage of private-for-profit facilities (17 percent) used forceps exclusively than public (3 percent) or not-for-profit (3 percent) facilities.

Table 4.3.5: Percent distribution of facilities that performed assisted vaginal delivery in the last 3 months according to instrument used, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that performed assisted vaginal delivery in the last 3 months	Among facilities that performed assisted vaginal delivery in the last 3 months, percent that used:		
		Vacuum extractor only	Forceps only	Both
National	1,321	86%	3%	11%
Region				
Tigray	118	87%	1%	12%
Afar	18	78%	6%	17%
Amhara	395	87%	4%	10%
Oromia	422	89%	3%	9%
Somali	42	76%	7%	17%
Benishangul-Gumuz	17	82%	12%	6%
SNNP	199	82%	4%	14%
Gambella	3	67%	0%	33%
Harari	11	82%	0%	18%
Addis Ababa	90	79%	4%	17%
Dire Dawa	6	67%	0%	33%
Facility type				
Hospitals/MCH specialty centres	268	44%	7%	49%
Health centres/clinics[1]	1,053	96%	2%	2%
Managing authority				
Public/government	1,239	87%	3%	10%
Private-for-profit	53	62%	17%	21%
Private-not-for-profit[2]	29	69%	3%	28%
Location				
Urban	750	78%	4%	19%
Rural	571	96%	3%	1%

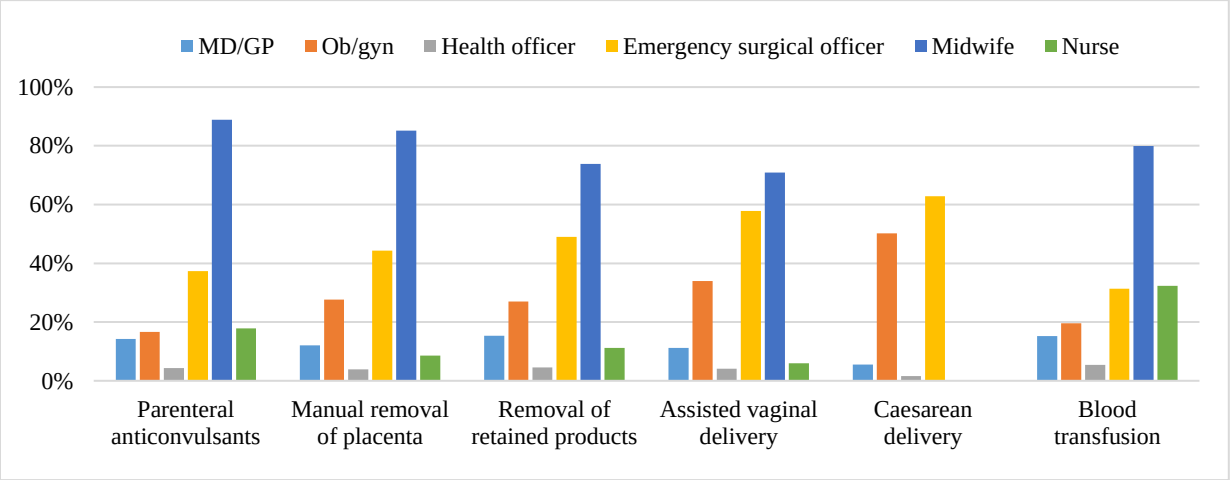
[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

4.4 Human resources who reportedly performed the signal functions in the last three months

Following the question whether the facility provided the signal function in the three months prior to the assessment, the interviewer asked directly which health workers had done so. This was asked of only a select group of EmONC and EmNeC signal functions. Table 4.4.1A in the Appendix (page 336) and Figure 4.4.1 present the hospitals/MCH speciality centres and Table 4.4.2A in the Appendix (page 337) presents the same information for health centres and clinics. For parenteral anticonvulsants, for example, among the 252 hospitals/specialty centres that provided these drugs in the last 3 months, 89 percent of hospitals said that midwives had administered the anticonvulsants, 37 percent reported an emergency surgical officer, and 18 percent mentioned nurses as the cadres who provided the service (multiple responses were allowed). In fact, most hospitals appeared to rely heavily on midwives to perform all the basic signal functions; according to policy, midwives are expected to provide all basic EmONC and EmNeC signal functions as well as blood transfusion. For caesarean delivery, most facilities mentioned emergency surgical officers (63 percent) while nurses were mentioned more frequently than midwives to administer antibiotics for neonatal sepsis or newborn IV fluids.

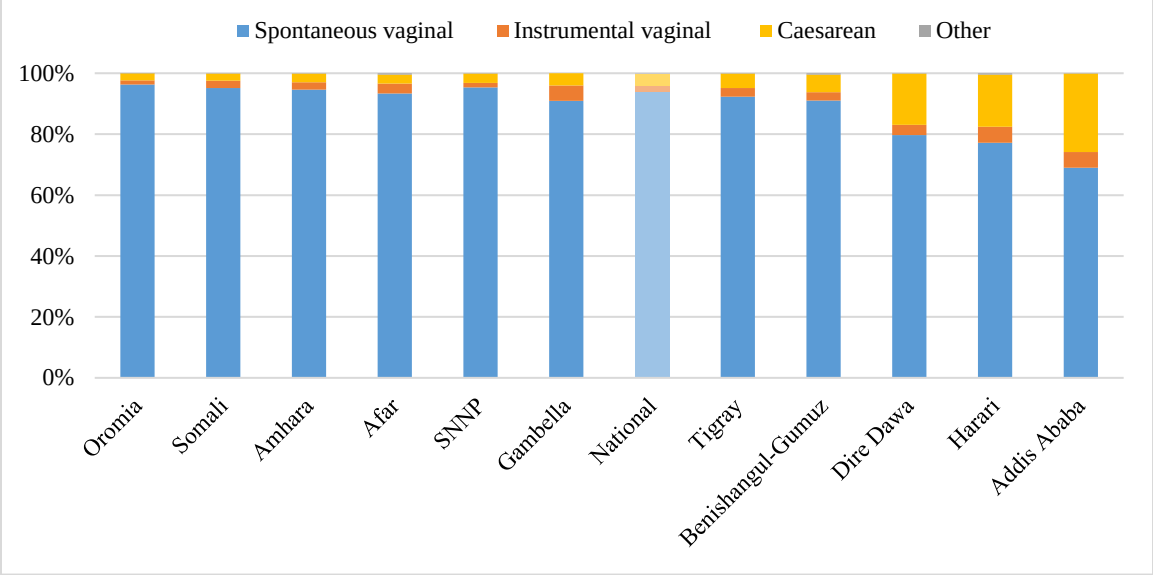
Figure 4.4.1: Percent of hospitals/MCH specialty centres where different health worker cadres performed selected EmONC signal functions, among hospitals/MCH specialty centres that performed that signal function in the last 3 months, Ethiopia EmONC, 2016



4.5 Mode of institutional delivery

Of the total institutional deliveries (1,924,330), 94 percent were spontaneous vaginal deliveries and only 4 percent were delivered by caesarean section (Table 4.5.1A page 338 in the Appendix and Figure 4.5.1 below). Assisted delivery rates (caesarean plus instrumental or assisted vaginal delivery) reached 20 percent or higher in Addis Ababa, Dire Dawa, and Harari. Most deliveries in public/government facilities (95 percent) were spontaneous vaginal deliveries, followed by private-not-for-profit facilities (75 percent). However, the proportion of spontaneous vaginal delivery was only 47 percent in private-for-profit facilities. The percentage of assisted deliveries in rural facilities was extremely low (less than 1 percent) compared to facilities in urban areas (11 percent). This might be driven by the concentration of health facilities that provide surgery in urban areas.

Figure 4.5.1: Percent distribution of institutional deliveries according to mode of delivery, by region, Ethiopia EmONC, 2016

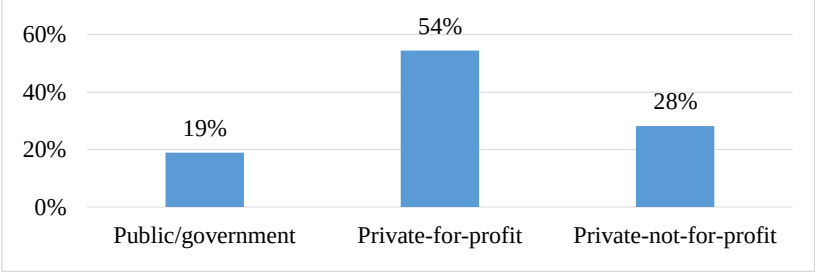


Institutional caesarean rate

Table 4.5.2A (page 339 in the Appendix) is an additional table dedicated to the institutional caesarean rate. It shows the institutional rate for all facilities as well as the rate among only facilities that conduct caesarean deliveries. Caesarean sections performed for medically indicated reasons are very effective in saving maternal and newborn lives. Most facilities that provide caesarean deliveries monitor and track their own institutional rate, as they should, for internal purposes. However, the institutional rate is difficult to interpret and for that reason the population-based caesarean rate is the preferred indicator. As stated earlier, according to WHO, population-based caesarean delivery rates higher than 10 percent are not associated with a reduction in maternal and newborn mortality. However, no evidence-based standard exists as a guide for the most appropriate institutional caesarean rate due to differences in client mix, proximity to other hospitals, and whether the hospital is a referral hospital.

As shown in the Table 3.5.1A and Table 4.5.2A, pages 322 and 339 in the Appendix, as well as Figure 4.5.2 below, one of the most striking findings is the variation by managing authority where more than half (54 percent) of the deliveries in private-for-profit facilities were by CS.

Figure 4.5.2: Institutional caesarean delivery rate in facilities that provide caesarean sections, by managing authority, Ethiopia EmONC, 2016



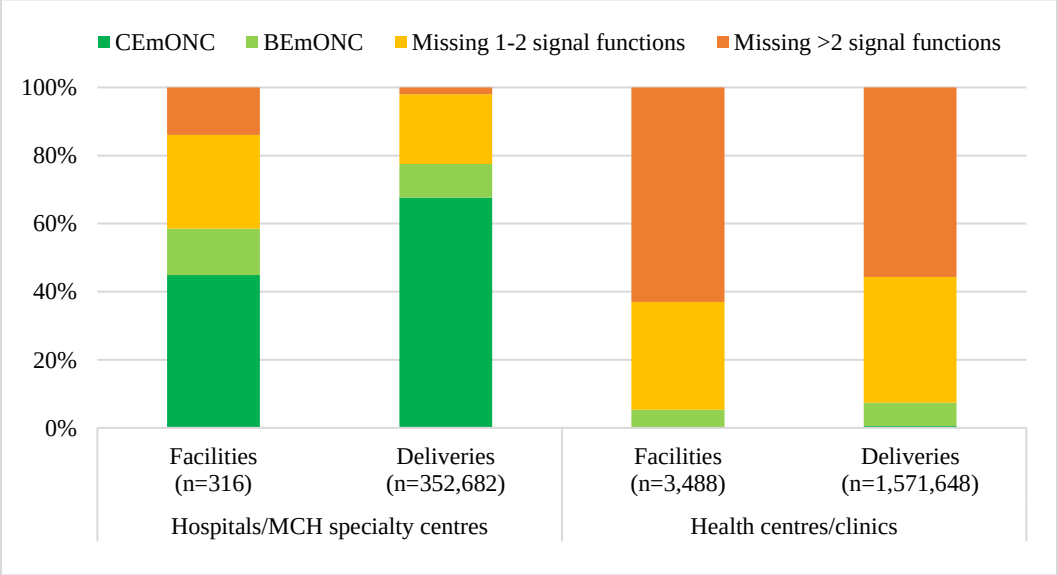
4.6 Where deliveries took place and complications treated

Location of deliveries

In Chapter 3 Table 3.3.2A in the Appendix (page 318) we saw the percent distribution of institutional deliveries for each region, stratified by facility type, EmONC status, managing authority, and location. Almost 2 million deliveries were registered: 82 percent took place in health centres/clinics; 7 percent in BEmONC and 13 percent in CEmONC facilities; 97 percent in public facilities; and 50 percent of deliveries were located in urban areas.

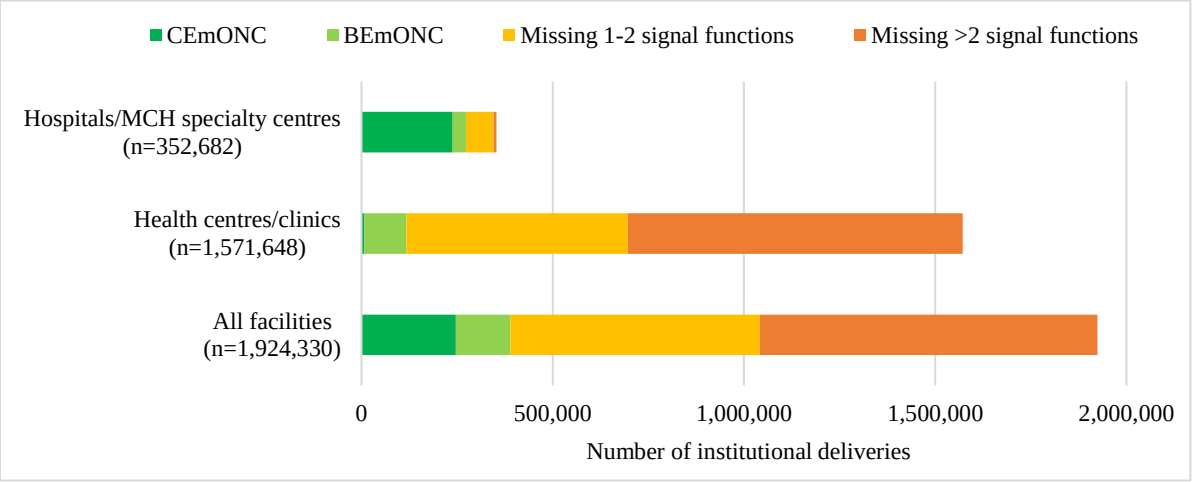
Figure 4.6.1 focuses on the distribution of facilities by EmONC status, and the distribution of deliveries according to the EmONC status of the facility where the delivery took place. It further shows these distributions separately for hospitals and health centres/clinics. Forty-three percent of hospitals and specialty centres were fully functioning as basic or comprehensive EmONC facilities but 72 percent of all hospital deliveries took place in EmONC facilities. Among health centres and clinics, 5 percent fully functioned as an EmONC facility while 7 percent of births took place in EmONC facilities. The percent of health centres considered EmONC and the percent of births in EmONC health centres did not vary substantially, given how few health centres fully functioned as EmONC.

Figure 4.6.1: Distribution of facilities and institutional deliveries according to facility EmONC status, by facility type, Ethiopia EmONC, 2016



The magnitude of this distribution is visualized differently in Figure 4.6.2 and captures the relative magnitude of deliveries, by facility type and EmONC status. Although 98 percent of hospital deliveries occurred in facilities missing two or fewer signal functions, the magnitude of deliveries that occured in facilites missing three or more signal functions was more than two and half times the hospital deliveries (882,699 deliveries occured in facilities missing more than two signal functions).

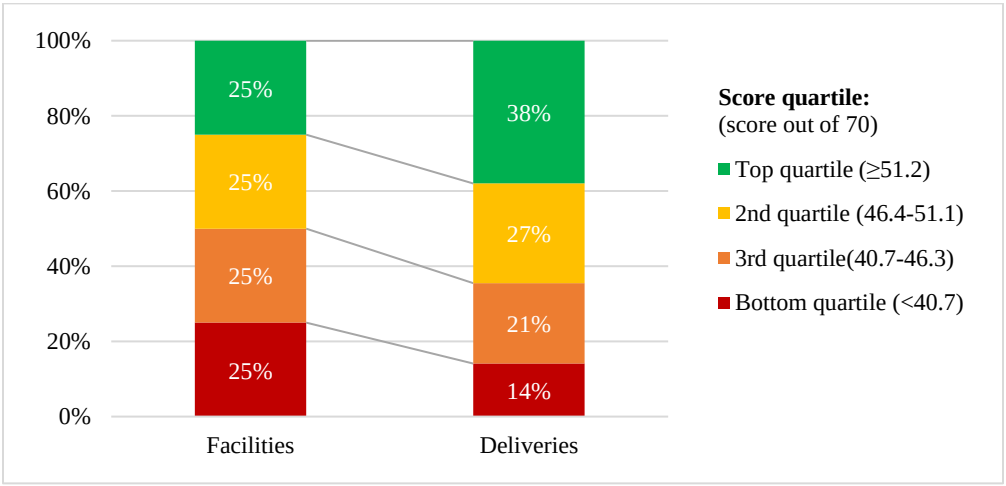
Figure 4.6.2: Distribution of institutional deliveries according to facility EmONC status, by facility type, Ethiopia EmONC, 2016



Distribution of institutional deliveries by facility readiness to provide routine delivery

We also looked at where deliveries took place relative to facilities' readiness to provide routine delivery. In Section 4.2, we described a composite score for readiness to provide routine delivery. The maximum possible overall score was 70, although just 1 percent of facilities scored 60 or higher (data not shown). Figure 4.6.3 shows the distribution of facilities and deliveries by quartiles of the routine delivery readiness score. Facilities were divided into four equal groupings based on their routine delivery readiness scores. The top 25 percent scored 51.2 and higher, the second quartile scored between 46.4 and 51.1, and so on. The bottom quartile included facilities that scored lower than 40.7 out of 70 points. The top quartile of facilities attended to 38 percent of all institutional deliveries, indicating that women are seeking out higher functioning facilities. There was not a strong correlation between the volume of deliveries and the total routine delivery score, indicating that women chose facilities that provided good quality routine delivery care, independent of facility volume.

Figure 4.6.3: Distribution of facilities and institutional deliveries by quartiles of facility score on routine delivery index, Ethiopia EmONC, 2016



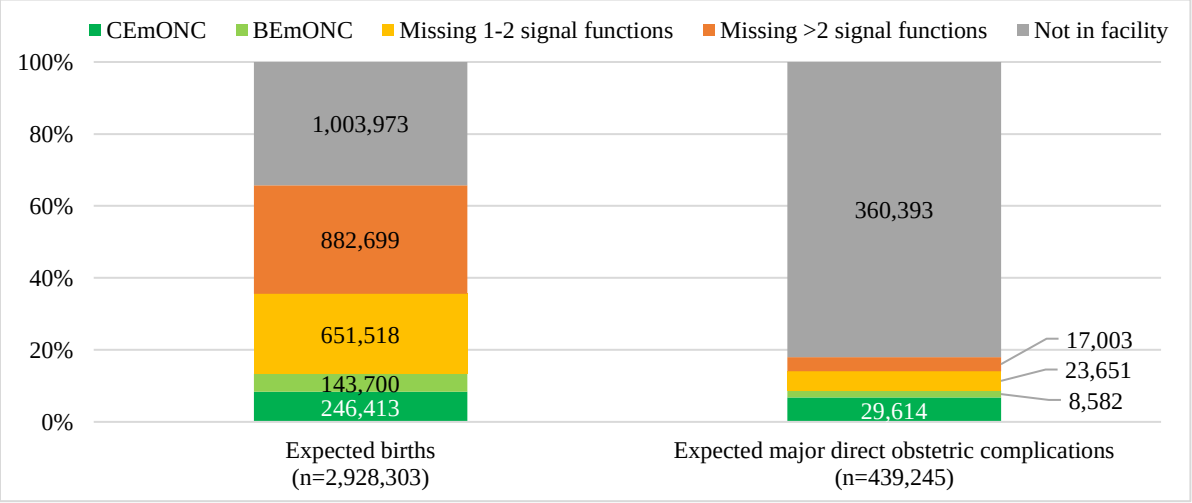
Location of complications treated

In Chapter 3 Table 3.4.1A in the Appendix (page 319) shows met need for EmONC based on the complications expected to occur in the population of women giving birth. In Table 4.6.1A in the Appendix (page 340) we see the first step in calculating met need. Four percent of all institutional deliveries had a major direct obstetric complication (DOC), either women presented with the DOC or developed one after admission, and in EmONC facilities only 2 percent of deliveries had a major DOC. Regions that recorded at least 1 in 10 women who delivered had a major DOC included Benishangul-Gumuz and Harari (10 percent each), Addis Ababa (13 percent) and Dire Dawa (12 percent).

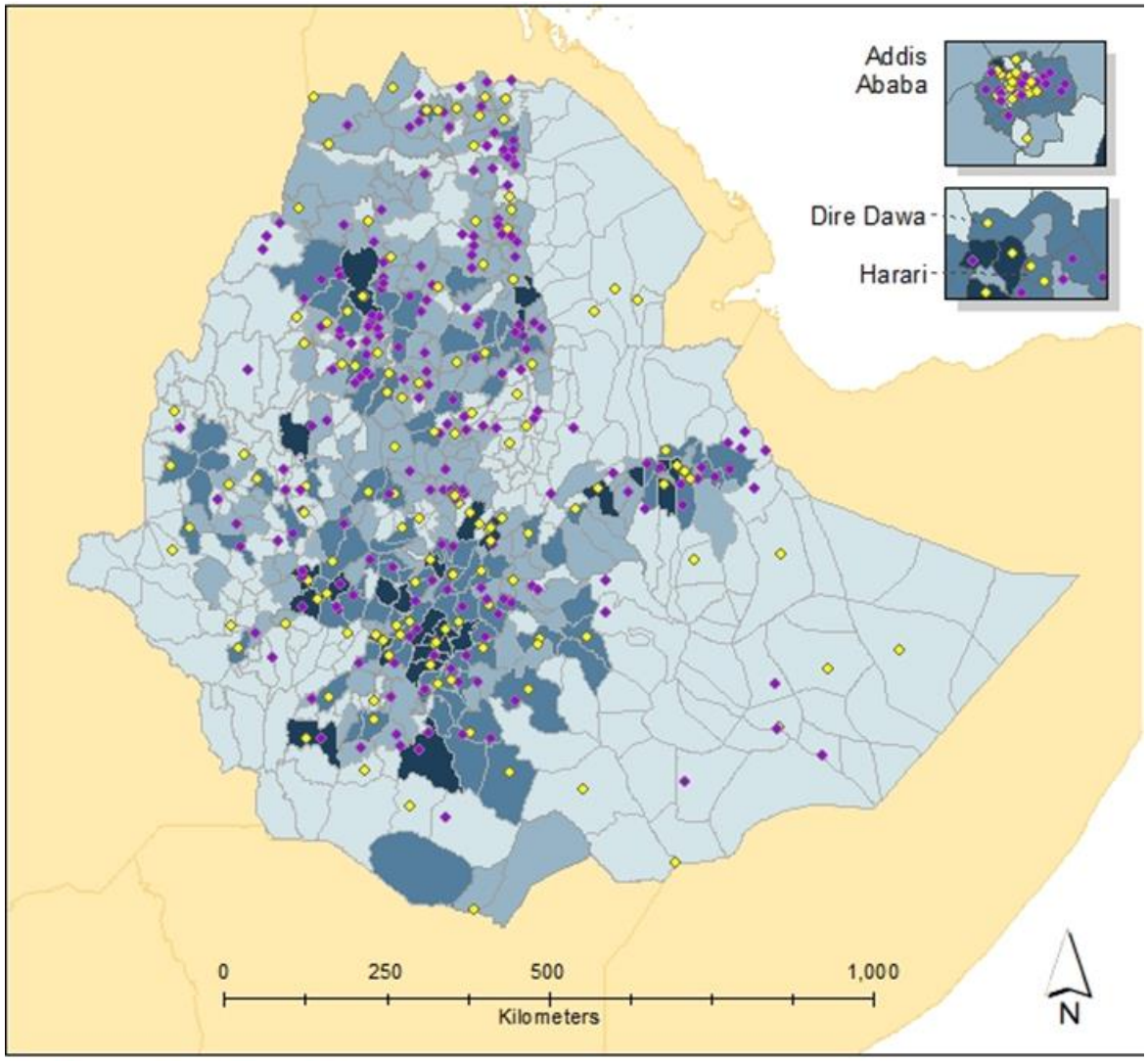
Twelve percent of hospital deliveries were complicated compared to 2 percent at health centres and clinics.

Figure 4.6.4 examines the distribution of expected births/deliveries and the distribution of expected complications, focusing on the EmONC status grading of where the women were attended. While 66 percent of all deliveries reportedly took place in the facilities surveyed, only 18 percent of expected major DOC were attended at institutions. Only about 9 percent of all expected complications were treated in EmONC facilities and another 5 percent were treated in facilities that were missing only 1-2 signal functions. However, the primary takeaway is that the clear majority of expected obstetric complications were not treated in any health facility or the complications went unreported by health workers. If 15 percent of all pregnancies are expected to develop a major DOC, one might expect higher percentages of complicated deliveries occurring in health facilities, especially considering the increase in institutional deliveries.

Figure 4.6.4: Percent distribution of expected births and expected major direct obstetric complications according to where attended (or not), Ethiopia EmONC, 2016



Map 4.6.1: Volume of Institutional Deliveries by Woreda and Location of EmONC Facilities



Facility EmONC status

- BEmONC
- CEmONC

Total deliveries in woreda

- 0 - 2,500
- 2,501 - 5,000
- 5,001 - 10,000
- 10,001 - 21,406

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
*EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

4.7 Frequency of major obstetric complications and maternal deaths

Of the total number of women with complications (200,892), 90 percent had direct complications and 10 percent had indirect complications (Table 4.7.1 below). Women with non-severe complications of abortion accounted for 25 percent, prolonged/obstructed labour accounted for 18 percent, followed by PPH/retained placenta (7 percent) and severe pre-eclampsia and eclampsia (6 percent). The single most frequent category of complications was "other direct" contributing 26 percent. These included pPROM, multiple gestation, post-term labour, cord prolapse, breech presentation, and other possible problems not included as a major DOC.

The most frequently recorded indirect complication was HIV/AIDS-related, which accounted for 7 percent of all complications. Relatively few indirect complications were recorded; this may have been the result of the difficulty of identifying pregnant women in the medical wards.

Table 4.7.1 also shows the distribution of maternal deaths due to all causes in health facilities. Among all maternal deaths, 43 percent were related to direct obstetric complications, 5 percent to indirect causes, and 52 percent were due to unknown or unspecified causes. In this assessment, the leading known causes of maternal deaths were PPH/retained placenta and APH together, responsible for 12 percent of all maternal deaths, and severe pre-eclampsia/eclampsia for 10 percent. Moreover, 26 percent of maternal complications were due to other direct obstetric complication, but this group was responsible for only 12 percent of deaths. It is unfortunate that the "other' category did not require documentation or specification of what was included among these "others".

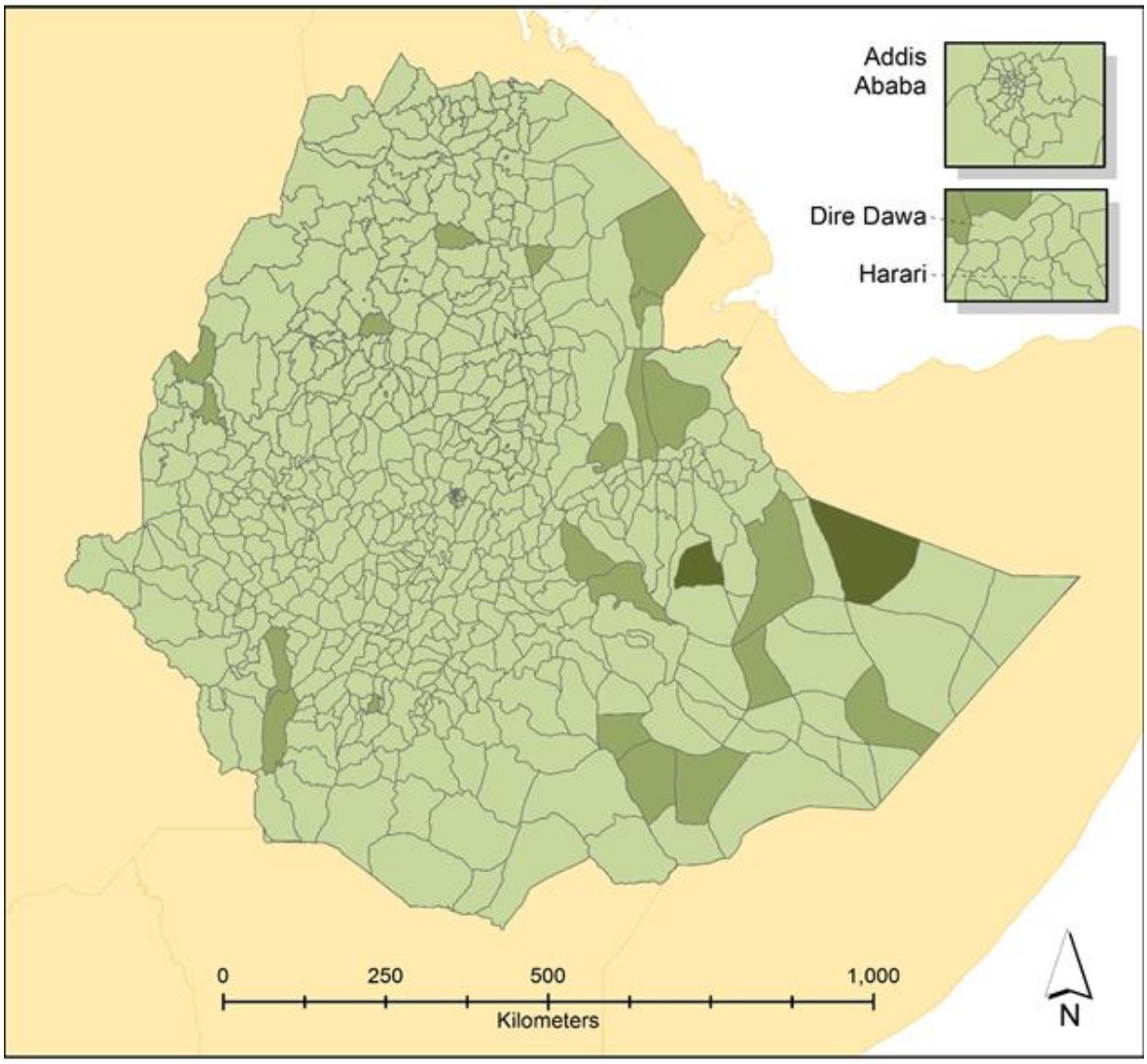
Although prolonged/obstructed labour accounted for 18 percent of all maternal complications, it contributed only 4 percent to the maternal deaths. Whereas, severe pre-eclampsia and eclampsia accounted for 6 percent of complications, these cases contributed 10 percent of all maternal deaths. Less than 1 percent of all maternal deaths were attributable to complications from abortion.

Table 4.7.1: Percent distribution of obstetric complications and maternal deaths according to direct and indirect complications/causes, Ethiopia EmONC, 2016

	Women with complications		Maternal deaths	
	n	%	n	%
Direct complications/causes	**181,179**	**90%**	**564**	**43%**
Ruptured uterus	1,604	1%	41	3%
Postpartum sepsis	1,820	1%	21	2%
Severe PE/E	11,924	6%	137	10%
Severe complications of abortion	3,793	2%	9	1%
Non-severe complications of abortion	50,231	25%		
APH	7,897	4%	30	2%
Obstructed/prolonged labour	36,394	18%	47	4%
PPH/retained placenta	13,440	7%	127	10%
Ectopic pregnancy	1,980	1%	0	0%
Other direct complications/causes	52,096	26%	152	12%
Indirect complications/causes	**19,713**	**10%**	**59**	**5%**
Malaria	430	0%	3	0%
HIV/AIDS related	13,600	7%	6	0%
Anaemia	1,966	1%	22	2%
Hepatitis	154	0%	4	0%
Other indirect complications/causes	3,563	2%	24	2%
Unknown/unspecified causes			**682**	**52%**
Total	**200,892**	**100%**	**1,305**	**100%**

APH = antepartum haemorrhage; PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

Map 4.7.1: Maternal Deaths in Facility per 100 Facility Deliveries by Woreda



Maternal Deaths per Facility Deliveries

- 0-0.4
- 0.5-2.5
- 2.6-7.0

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Causes of maternal death: Patterns by type of facility and managing authority

Slightly more than half of all maternal deaths took place in health centres (52 percent) although 82 percent of deliveries took place at this level. The distribution of the causes of maternal death varied depending upon the type of facility and managing authority. According to Table 4.7.2, over half of institutional maternal deaths were without a specific cause of death (52 percent) and unknown causes were disproportionately found in health centres (79 percent). Between 18 and 31 percent of maternal deaths in hospitals were without a cause of death and most deaths were attributable to direct causes: in general hospitals 77 percent of maternal deaths were direct, 66 percent in referral/specialized hospitals, and 64 percent in primary hospitals. Overall, the distribution of causes was similar across hospitals. MCH speciality centres and higher clinics reported only one maternal death each in 2015.

Most maternal deaths (97 percent) were recorded in government owned facilities. Of the 1,264 deaths in government facilities, 43 percent were direct, 5 percent indirect, and 53 percent had unknown/unspecified causes. In both private-for profit and private-not for profit owned facilities 56 percent of deaths were due to direct causes.

4.8 Cause-specific case fatality rates and where women died

As shown in Table 4.8.1A in the Appendix on page 341 and Figure 4.8.1, the highest cause-specific case fatality rate was ruptured uterus (2.6 percent), followed by postpartum sepsis (1.2 percent), severe pre-eclampsia and eclampsia (1.1 percent), PPH/retained placenta (0.9 percent), APH (0.4 percent), severe abortion complication (0.2 percent), and prolonged/obstructed labour (0.1 percent). The large number of unknown causes of death (> 50 percent) suggests that these rates might be underestimated.

Table 4.7.2: Percent distribution of maternal deaths according to cause, by facility type and managing authority, Ethiopia EmONC, 2016

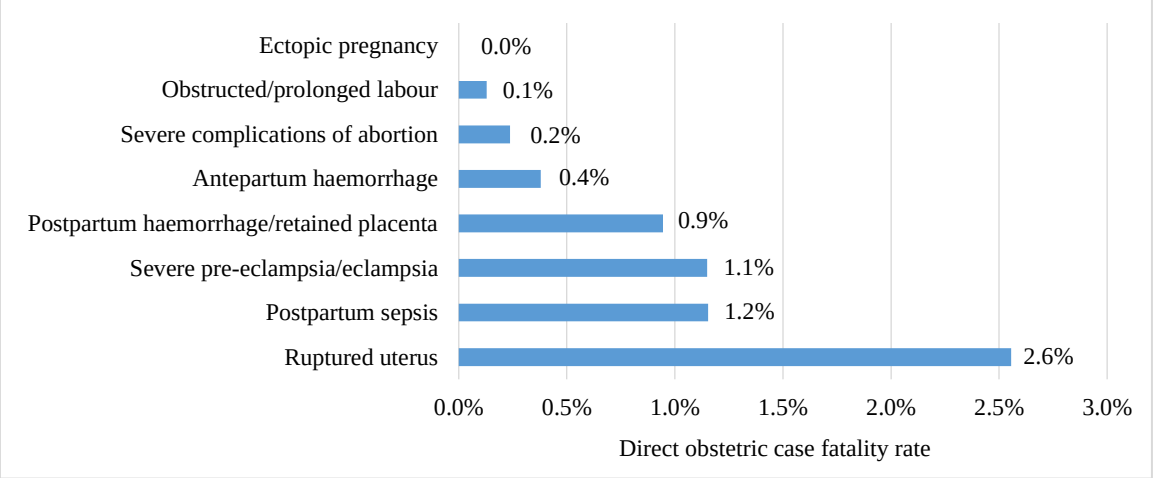
		Facility type[1]						Managing authority		
	National	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	Higher clinics	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=1,305	n=267	n=230	n=131	n=1	n=675	n=1	n=1,264	n=25	n=16
Direct causes	**43%**	**66%**	**77%**	**64%**	**0%**	**19%**	**100%**	**43%**	**56%**	**56%**
Ruptured uterus	3%	5%	7%	8%	0%	0%	0%	3%	0%	13%
Postpartum sepsis	2%	3%	3%	2%	0%	1%	0%	2%	4%	0%
Severe PE/E	10%	19%	20%	18%	0%	2%	0%	11%	0%	25%
Severe complications of abortion	1%	1%	1%	1%	0%	0%	0%	1%	4%	0%
APH	2%	3%	5%	2%	0%	1%	0%	2%	8%	13%
Obstructed/prolonged labour	4%	3%	5%	5%	0%	3%	0%	4%	0%	0%
PPH/retained placenta	10%	13%	11%	18%	0%	6%	100%	10%	4%	6%
Ectopic pregnancy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other direct causes	12%	18%	24%	11%	0%	5%	0%	11%	36%	0%
Indirect causes	**5%**	**10%**	**5%**	**5%**	**0%**	**2%**	**0%**	**5%**	**0%**	**13%**
Malaria	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
HIV/AIDS related	0%	1%	0%	1%	0%	0%	0%	2%	0%	6%
Anaemia	2%	3%	4%	2%	0%	0%	0%	0%	0%	0%
Hepatitis	0%	1%	0%	0%	0%	0%	0%	2%	0%	6%
Other indirect causes	2%	4%	1%	3%	0%	1%	0%	0%	0%	0%
Unknown/unspecified causes	**52%**	**24%**	**18%**	**31%**	**100%**	**79%**	**0%**	**53%**	**44%**	**31%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

APH = antepartum haemorrhage; PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

[1] No maternal deaths were recorded in MCH specialty clinics.

[2] Includes NGO, faith-based, or mission facilities.

Figure 4.8.1: Cause-specific direct obstetric case fatality rates in all facilities, Ethiopia EmONC, 2016



4.9 Abortion indicators

Two abortion indicators are highlighted: 1) Safe abortion as a percentage of all abortions, and 2) the percentage of postabortion care (PAC) cases that presented with severe complications (severe haemorrhage, infection, perforation or organ injury) (Table 4.9.1).

Of the 134,871 abortions documented, 80,847 (60 percent) were safe voluntary pregnancy terminations. The percentage of safe abortions ranged between 6 percent in Gambella to 67 percent in Dire Dawa. Three-fourths of abortions in health centres were safe abortions compared to 41 percent in hospitals. In private-not-for-profit facilities 90 percent were safe abortions; a larger percentage of safe abortions was found in rural facilities (70 percent) than in urban facilities (58 percent).

Seven percent of spontaneous, incomplete, and unsafe abortions had evidence of severe complications. This percentage was as low as 0 percent in Gambella and as high as 31 percent in Benishangul-Gumuz. In health centres this percentage was 9 percent and in hospitals 6 percent. Substantial variation could be seen in urban and rural facilities. In the latter, 14 percent of PAC cases in rural facilities had severe signs and symptoms compared to 6 percent in urban facilities.

Table 4.9.1: Percent distribution of abortions according to classification as safe abortions, post-abortion care (PAC) cases without severe complications, and PAC cases with severe complications, and proportion of PAC cases considered severe, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of abortions	Abortion classification				Proportion of PAC cases considered severe
		Safe abortions	PAC cases (non-severe)	PAC cases (severe)	Total	
National	134,871	60%	37%	3%	100%	7%
Region						
Tigray	16,108	65%	32%	2%	100%	7%
Afar	568	42%	46%	12%	100%	20%
Amhara	25,537	61%	34%	6%	100%	14%
Oromia	52,305	66%	33%	1%	100%	4%
Somali	863	14%	68%	19%	100%	22%
Benishangul-Gumuz	856	39%	42%	19%	100%	31%
SNNP	19,364	51%	47%	2%	100%	4%
Gambella	294	6%	94%	0%	100%	0%
Harari	1,410	22%	75%	2%	100%	3%
Addis Ababa	15,819	54%	43%	3%	100%	6%
Dire Dawa	1,747	67%	29%	4%	100%	12%
Facility type						
Hospitals/MCH specialty centres	60,327	41%	55%	3%	100%	6%
Health centres/clinics[1]	74,544	75%	23%	2%	100%	9%
Managing authority						
Public/government	115,810	57%	40%	3%	100%	7%
Private-for-profit	4,624	46%	53%	1%	100%	1%
Private-not-for-profit[2]	14,437	90%	9%	1%	100%	5%
Location						
Urban	110,844	58%	40%	3%	100%	6%
Rural	24,027	70%	26%	4%	100%	14%

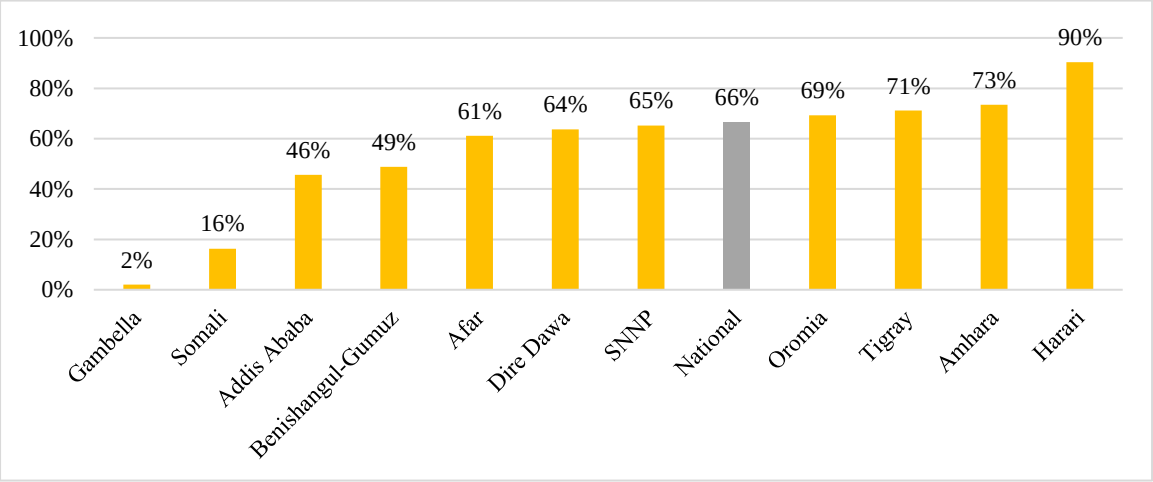
PAC = post-abortion care.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

In Table 4.9.2A on page 341 of the Appendix we see the percentage of women post-abortion and postpartum who were discharged with contraception. Of the total 134,871 abortion cases, 66 percent were discharged with contraception. Regional variation was considerable: the highest percentage of abortion clients reporting postabortion contraception was in Harari (90 percent) and the lowest in Gambella (2 percent) (Figure 4.9.1). Abortion logbooks and registers appeared to consistently collect post-abortion contraception.

Figure 4.9.1: Percent of post-abortion cases discharged with family planning method, by region, Ethiopia EmONC, 2016



Postpartum contraception, on the other hand, was extremely low or very poorly recorded; less than 1 percent of postpartum women were discharged with family planning (Table 4.9.2A in the Appendix on page 341). The highest postpartum contraception was in Afar and Addis Ababa (each 2 percent) and the lowest in Benishangul-Gumuz and Gambella (each 0 percent).

4.10 Comparisons between 2008 and 2016

Readiness and provision of the EmONC signal functions

Readiness to provide the signal functions – a combination of having the staff who could provide the signal function and having the drugs, equipment and supplies to perform the procedure or provide the treatment – improved across almost all the EmONC signal functions (Table 4.10.1) between 2008 and 2016, in all categories of health facility. However, there were decreases in readiness to provide parenteral antibiotics in health centres, public and non-profit facilities, and both urban and rural facilities. Facility readiness to provide assisted vaginal deliveries decreased 11 points among not-for-profit facilities, but increased or remained the same in all other facility categories. Readiness increased or remained the same for all EmONC signal functions in hospitals and private facilities.

Other than antibiotics, health centres saw impressive increases in readiness to provide each of the basic signal functions. Improvement was observed for manual removal of placenta (73 percentage points), and newborn resuscitation (47 points). Both urban and rural facilities saw increases in readiness for most of the signal functions, except for antibiotics. The level of readiness to provide removal of retained products was particularly low among health centres and rural facilities.

Actual provision (lower panel) of the signal functions in hospitals remained high while it tended to increase at health centres. An increase in the provision of neonatal resuscitation merits highlighting; in 2008, 38 percent of health centres had provided neonatal resuscitation compared to 71 percent in 2016. This was also reflected in a similar increase in neonatal resuscitation among government facilities.

Table 4.10.1: Percent of facilities ready to provide and currently providing EmONC signal functions in 2008 and 2016, by facility type, managing authority, and location, Ethiopia EmONC, 2016

	Facility type				Managing authority						Location			
	Hospitals/MCH specialty centres		Health centres/clinics[1]		Public/government		Private-for-profit		Private-not-for-profit[2]		Urban		Rural	
	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016
Number of facilities	111	316	684	3,488	749	3,662	26	83	20	59	703	1,497	92	2,307
Readiness to provide EmONC signal function														
Parenteral antibiotics	66%	78%	72%	61%	72%	63%	63%	72%	70%	56%	72%	64%	67%	62%
Parenteral uterotonics	93%	96%	69%	91%	73%	91%	63%	78%	65%	92%	74%	92%	59%	91%
Parenteral anticonvulsants	93%	95%	34%	70%	41%	72%	67%	70%	70%	68%	44%	79%	26%	67%
Manual removal of placenta	55%	98%	22%	95%	25%	95%	41%	98%	55%	97%	27%	97%	21%	94%
Removal of retained products	79%	90%	21%	34%	29%	37%	48%	67%	40%	56%	32%	57%	7%	26%
Assisted vaginal delivery	95%	95%	34%	44%	41%	47%	63%	90%	75%	64%	45%	66%	23%	38%
Newborn resuscitation with bag and mask	60%	86%	22%	69%	26%	70%	52%	81%	40%	76%	29%	77%	16%	66%
Caesarean delivery	58%	69%	1%	0%	6%	4%	52%	61%	25%	24%	10%	14%	1%	1%
Blood transfusion	29%	45%	0%	0%	3%	3%	33%	53%	20%	12%	5%	10%	1%	0%
Facility providing EmONC signal function														
Parenteral antibiotics	99%	96%	56%	79%	62%	80%	62%	93%	65%	81%	63%	86%	55%	77%
Parenteral uterotonics	100%	95%	74%	93%	78%	93%	58%	88%	85%	93%	79%	94%	61%	93%
Parenteral anticonvulsants	84%	80%	11%	22%	19%	26%	62%	53%	55%	39%	24%	37%	5%	19%
Manual removal of placenta	90%	81%	72%	60%	76%	62%	42%	54%	70%	61%	77%	70%	57%	56%
Removal of retained products	95%	76%	37%	39%	44%	42%	69%	47%	60%	47%	48%	56%	20%	33%
Assisted vaginal delivery	89%	85%	25%	30%	33%	34%	50%	64%	60%	49%	37%	50%	12%	25%
Newborn resuscitation with bag and mask	88%	90%	38%	71%	44%	73%	65%	67%	65%	66%	48%	79%	20%	69%
Caesarean delivery	78%	80%	1%	1%	9%	5%	58%	67%	35%	27%	13%	17%	1%	1%
Blood transfusion	64%	65%	0%	0%	7%	4%	42%	59%	35%	20%	10%	14%	1%	0%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Causes of maternal death and direct cause-specific case fatality rates

Table 4.10.2 summarizes the changes in the causes of maternal death. The primary change was the increased proportion of unknown causes of death. It is not clear why the recording of causes of death deteriorated so dramatically since 2008. It may reflect how the implementation of the MDSR has made staff more conscientious of accurately assigning a cause of death. Nevertheless, despite how this category affects the overall distributions, it appears that deaths due to ruptured uterus and to obstructed or prolonged labour may have declined. It is also noteworthy that maternal deaths due to malaria dropped from 9 percent in 2008 to less than 1 percent in 2016.

Table 4.10.2: Percent distribution of maternal deaths according to cause and cause-specific case fatality rates in 2008 and 2016, Ethiopia EmONC, 2016

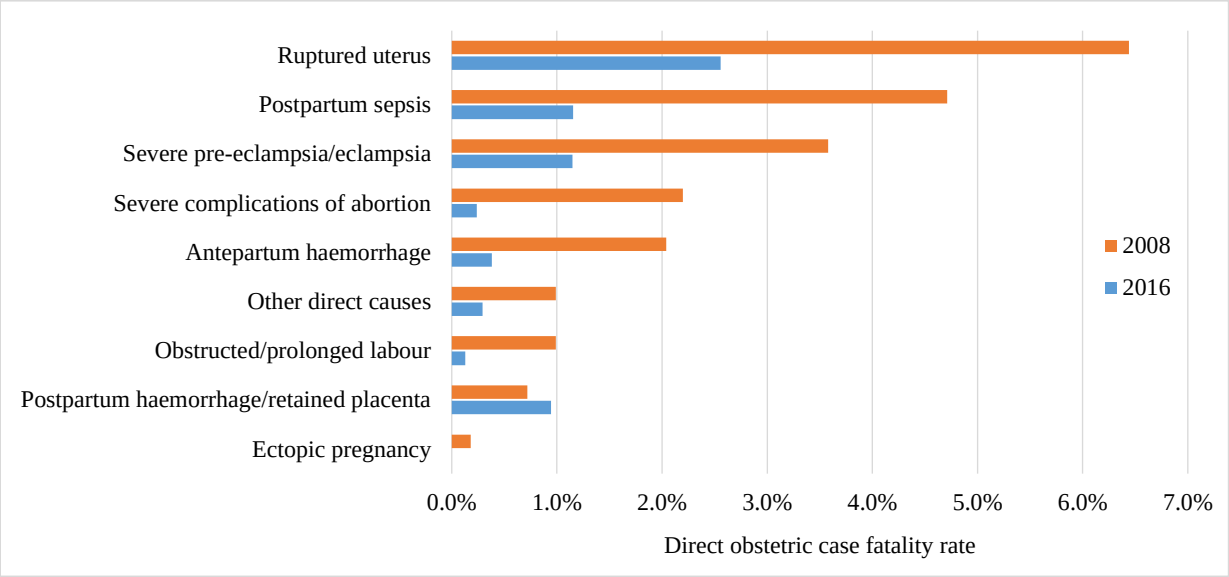
	Percent distribution of maternal deaths by cause		Cause-specific case fatality rates	
	2008 (n=685)	2016 (n=1,305)	2008	2016
Direct causes	**69%**	**43%**	**1.1%**	**0.4%**
Ruptured uterus	12%	3%	6.4%	2.6%
Postpartum sepsis	5%	2%	4.7%	1.2%
Severe PE/E	11%	10%	3.6%	1.1%
Severe complications of abortion	6%	1%	2.2%	0.2%
APH	5%	2%	2.0%	0.4%
Obstructed/prolonged labour	13%	4%	1.0%	0.1%
PPH/retained placenta	7%	10%	0.7%	0.9%
Ectopic pregnancy	0%	0%	0.2%	0.0%
Other direct causes	9%	12%	1.0%	0.3%
Indirect causes	**21%**	**5%**	**3.4%**	**0.3%**
Malaria	9%	0%	11.4%	0.7%
HIV/AIDS related	4%	0%	0.9%	0.0%
Anaemia	4%	2%	4.9%	1.1%
Hepatitis	0%	0%	0.0%	2.6%
Other indirect causes	3%	2%	7.7%	0.7%
Unknown/unspecified causes[1]	**10%**	**52%**		
Total	**100%**	**100%**	**1.5%**	**0.9%**

APH = antepartum haemorrhage; PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

[1] The total number of maternal deaths due to unknown causes was 72 in 2008 and 682 in 2015.

Cause-specific case fatality rates were also compared across the two years (Figure 4.10.1). Nationally, the overall rate declined from 1.1 percent in 2008 to 0.4 percent in 2016. Nearly all cause-specific case fatality rates showed improvement with the exceptions of PPH/retained placenta, which remained at about 1 percent, and hepatitis. These results, however, should be viewed with caution, since more than half of the institutional maternal deaths were not included in these calculations.

Figure 4.10.1: Cause-specific direct obstetric case fatality rates in 2008 and 2016, Ethiopia EmONC, 2016



Chapter 5: Performance of Other Maternal and Newborn Health (MNH) Services, Procedures, and Policy Environment

Key Findings

- Eighty-five percent or more of facilities provided focused antenatal care, normal delivery services, postnatal care, family planning, diagnosis and treatment for STIs, and the PMTCT package.
- Less than half of all facilities provided safe abortion services and adolescent/youth friendly sexual and reproductive health services.
- The median length of stay after a normal delivery was 12 hours but at private facilities the median duration was only 6 hours.
- Among public facilities 62 percent of facilities charged fees before receiving general services but only small percentages charged for delivery services or medicines and supplies, or for emergency services and drugs or supplies. Fewer than half of facilities had a formal fee waiver system in place. Between 2008 and 2016, it appears that cost barriers have been reduced.
- About two-thirds of facilities have implemented the MDSR and have a committee in place, but only 39 percent reported implementing perinatal death reviews.
- Only 24 percent of facilities provided the opportunity for birth registration on-site (civil registration system).
- Referral/specialized and general hospitals reported more bed shortage problems than other facilities, with women having to sleep on the floor, share beds with other women, or deliver on the floor.

In addition to the emergency signal functions many other essential services make up the package of maternal and newborn care and those services are examined in this chapter. The results are based on the 3,804 facilities where deliveries took place in the 12 months preceding the survey.

5.1 Availability of routine services and performance of other MNH services

Focused antenatal care, postnatal care, diagnosis and treatment of sexually transmitted infections, family planning, and prevention of mother-to-child transmission of HIV

Facility in-charges were asked about the MNH services they provided. Nationally all facilities (100 percent) reported that they provided focused antenatal care (FANC), 97 percent postnatal care (PNC), 92 percent diagnosis and treatment of sexually transmitted infections (STIs), 99 percent family planning services, and 85 percent PMTCT (Table 5.1.1). Forty-five percent of facilities reported that they provided adolescent/youth friendly sexual and reproductive health services. The percentage of facilities that reported providing FANC and PNC services did not vary by facility type or managing authority. It should be noted that data collectors did not verify that these services were being provided when they visited facilities; these analyses are based solely on self-reporting from facility in-charges.

Table 5.1.1: Percent of facilities providing selected services, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Focused antenatal care	Normal delivery	Blood typing	Postnatal care	FP services	Post-abortion care	Safe abortion	Cervical screening (pap smear/VIA)	Diagnosis and treatment for STIs	PMTCT package	Adolescent/ youth friendly SRHS
National	3,804	100%	100%	65%	97%	99%	69%	43%	16%	92%	85%	45%
Region												
Tigray	255	100%	100%	78%	100%	99%	91%	78%	22%	99%	99%	75%
Afar	77	100%	100%	47%	92%	97%	71%	39%	16%	91%	70%	79%
Amhara	876	100%	100%	62%	99%	99%	73%	43%	16%	92%	90%	54%
Oromia	1,405	100%	100%	67%	100%	99%	66%	37%	12%	93%	80%	39%
Somali	161	98%	99%	47%	93%	93%	60%	16%	9%	89%	47%	27%
Benishangul-Gumuz	43	100%	100%	56%	98%	100%	81%	67%	26%	81%	84%	56%
SNNP	773	99%	100%	59%	90%	98%	62%	39%	15%	88%	93%	31%
Gambella	27	100%	100%	19%	96%	96%	59%	22%	15%	100%	78%	11%
Harari	15	100%	93%	93%	100%	100%	100%	80%	33%	100%	87%	93%
Addis Ababa	151	99%	99%	95%	100%	97%	77%	67%	46%	99%	97%	59%
Dire Dawa	21	95%	100%	90%	95%	100%	86%	86%	19%	100%	76%	95%
Facility type												
Referral/specialized hospitals	30	100%	97%	100%	100%	97%	97%	93%	83%	97%	93%	77%
General hospitals	103	99%	100%	100%	100%	96%	97%	81%	73%	100%	97%	63%
Primary hospitals	160	98%	100%	97%	98%	97%	94%	83%	45%	100%	95%	51%
MCH specialty centres	23	100%	96%	96%	100%	100%	100%	87%	87%	100%	100%	61%
Health centres	3,459	100%	100%	61%	97%	99%	66%	39%	11%	91%	84%	43%
MCH specialty clinics	16	100%	94%	81%	100%	94%	88%	69%	81%	94%	69%	63%
Higher clinics	13	92%	100%	92%	100%	77%	85%	62%	38%	100%	100%	38%
Managing authority												
Public/government	3,662	100%	100%	64%	97%	99%	69%	42%	14%	92%	85%	44%
Private-for-profit	83	96%	98%	96%	98%	94%	89%	72%	80%	98%	96%	52%
Private-not-for-profit[1]	59	100%	98%	73%	100%	68%	71%	32%	36%	100%	81%	59%
Location												
Urban	1,497	100%	99%	85%	98%	98%	85%	67%	25%	98%	91%	59%
Rural	2,307	100%	100%	51%	97%	99%	59%	27%	10%	88%	81%	36%

FP = family planning; PMTCT = prevention of mother to child transmission (of HIV); SRHS = sexual and reproductive health services; STI = sexually transmitted infection; VIA = visual inspection with acetic acid.

[1] Includes NGO, faith-based, or mission facilities.

At the national level, all facilities provided care for normal deliveries. Among regions, 93 percent of facilities in Harari region provided normal delivery services. Among types of facilities, higher clinics (77 percent) were the least likely to provide this service. All hospitals and 93 percent of health centres provided this service.

Safe abortion

Ethiopia liberalized its abortion law in May 2005. Safe abortion is now allowed in cases where the pregnancy is the result of rape or incest (based on the woman's report, no verification is legally necessary); if the continuation of the pregnancy endangers the life or health of the mother; if a woman's life is in imminent danger without immediate intervention; if the foetus has an incurable deformity; or if the pregnant woman is physically or mentally unfit to raise a child (including age younger than 18 years). The government policy stipulates that all health facilities that have trained personnel, supplies and equipment as specified in the Technical and Procedural Guidelines for Safe Abortion Services in Ethiopia[34] can perform termination of pregnancy when less than 12 weeks gestation. Safe termination of pregnancies of higher gestation is performed only where secondary or tertiary level of care is available. General practitioners (GPs), health officers, midwives and clinical (diploma) nurses are allowed to perform manual vacuum aspiration (MVA).

At the time of the EmONC assessment, 43 percent of all facilities reported that they provided safe abortion services: 93 percent of referral hospitals and 39 percent of health centres (Table 5.1.1). Private-for-profit facilities (72 percent) were more likely to provide the service than other managing authority types.

Cervical cancer screening

Overall 16 percent of facilities provided cervical cancer screening service (Table 5.1.1). The region with the highest percentage of facilities with cervical cancer screening was Addis Ababa (46 percent) while facilities in Somali region (9 percent) were the least likely to provide this service. Health centres (11 percent) were less likely to provide this service than other facilities. Facilities managed by the private-for-profit sector (80 percent) were the most likely to offer cervical screening.

Hospital services

Table 5.1.2A (see Appendix page 342) includes services that generally are provided by hospitals. Eighty and 49 percent of hospitals provided obstetric surgery and general anaesthesia, respectively. Simple fistula repair was reported by only 12 percent of hospitals.

Other maternal and newborn services

Interviewers inquired about other services in more detail, such as alternative infant feeding (expressing breast milk and using a cup or spoon), ARVs for newborns in the maternity / labour ward (PMTCT), ARVs to seropositive mothers in maternity / labour, episiotomy, craniotomy and breech delivery. Questions were directed at their provision in the last three months preceding the survey, and if the service had not been provided, follow-up questions as to why they were not provided were asked (Table 5.1.3). At the time of the EmONC assessment, 23 percent of all facilities reported that they provided alternative infant feeding, 28 percent provided ARVs to newborns in the maternity / labour ward (PMTCT), 30 percent provided ARVs to seropositive mothers in maternity / labour, 80 percent used a partograph, 47 percent performed breech deliveries, 79 percent provided episiotomy, and almost all provided temporary family planning

[34] Ethiopian Ministry of Health. Technical and Procedural Guidelines for Safe Abortion Services in Ethiopia., Addis Ababa, Ethiopia: Ministry of Health, 2006.

methods. We excluded the health centres and clinics for three procedures that are primarily hospital-based in practice: craniotomy was provided at 39 percent of hospitals, simple repairs for fistula at 12 percent of hospitals, and surgical family planning at 54 percent.

For many items – alternative infant feeding, ARV provision, episiotomy, breech delivery, craniotomy, simple fistula repair, and permanent contraception – the primary reason for non-provision was the lack of clients with indications to provide the service. The second most frequently mentioned explanation for non-provision was lack of supplies or equipment: 73 percent of facilities that did not use a partograph in the last three months, 44 percent of facilities that did not provide ARVs, and 28 percent of facilities who did not provide temporary FP methods.

5.2 Length of stay for women after normal and caesarean deliveries

Table 5.2.1 shows the median length of stay in hours after normal delivery. At national level the median length of stay after normal delivery was 12 hours. Women reportedly stayed longer in government facilities (12 hours) than facilities not managed by the government. Table 5.2.1 also shows the median length of stay for caesarean section. At national level the median length of stay after caesarean delivery was 72 hours. Women receiving care after a caesarean delivery in Addis Ababa remained 48 hours on average, less than the national average.

Table 5.1.3: Percent of facilities that provided other MNH services in the last 3 months by facility type, and reasons for not providing the service, Ethiopia EmONC, 2016

	Percent of facilities that provided the service in the last 3 months			Number of facilities that did not provide the service in the last 3 months	Percent of facilities that did not provide the service in the last 3 months due to: (multiple responses allowed)					
	All facilities	Hospitals/ MCH specialty centres	Health centres/ clinics[1]		Lack of staff	Training needed	Lack of supplies/ equipment	Weak management	Unsupportive or no policy	No indication/ clients
	n=3,804	n=316	n=3,488							
Other MNH services										
Alternative feeding (expressing breast milk and using a cup or spoon for feeding) to babies	23%	65%	19%	2,928	1%	8%	34%	1%	3%	73%
ARVs to newborns in the maternity/labour ward (PMTCT)	28%	71%	25%	2,722	3%	24%	44%	1%	11%	63%
ARVs to seropositive mothers in maternity/labour ward	30%	69%	26%	2,674	3%	24%	44%	1%	11%	63%
Partograph to manage labour	80%	89%	79%	756	7%	13%	73%	15%	1%	7%
Breech delivery	47%	80%	44%	2,017	1%	6%	5%	1%	5%	89%
Episiotomy	79%	94%	78%	792	2%	5%	5%	1%	4%	89%
Craniotomy/other type of destructive delivery[2]		39%		193	4%	11%	16%	1%	9%	74%
Simple fistula repair[2]		12%		277	6%	12%	6%	1%	18%	77%
Temporary FP methods	97%	94%	97%	116	4%	18%	28%	6%	25%	34%
Surgical/permanent FP[2]		54%		144	10%	23%	17%	1%	8%	63%

ARVs = antiretrovirals; FP = family planning; PMTCT = prevention of mother to child transmission (of HIV).

[1] Includes MCH specialty clinics and higher clinics.

[2] Calculated for hospitals/MCH centres only, as lower level facilities are not expected to perform these services.

Table 5.2.1: Percent distribution of average length of stay after normal delivery and caesarean delivery, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Normal delivery							Caesarean delivery						
	Number of facilities	<6 hours	6 hours	7-12 hours	13-24 hours	>24 hours	Median length of stay (hrs)	Number of facilities	<24 hours	≥24 and <48 hours	≥48 and <72 hrs	72 hours	>72 hours	Median length of stay (hrs)
National	3,804	4%	40%	15%	37%	5%	12	312	14%	5%	14%	40%	27%	72
Region														
Tigray	255	0%	46%	18%	28%	7%	8	37	14%	0%	8%	27%	51%	96
Afar	77	21%	47%	21%	12%	0%	6	7	0%	0%	14%	71%	14%	72
Amhara	876	3%	48%	20%	25%	4%	6	49	8%	6%	10%	39%	37%	72
Oromia	1,405	1%	16%	11%	67%	4%	24	78	14%	6%	8%	47%	24%	72
Somali	161	17%	30%	23%	20%	9%	8	12	42%	0%	8%	25%	25%	60
Benishangul-Gumuz[1]	43	7%	74%	9%	7%	2%	6	2	50%	0%	0%	0%	50%	92
SNNP	773	8%	63%	11%	13%	5%	6	63	18%	5%	14%	32%	32%	72
Gambella	27	11%	67%	4%	19%	0%	6	1	0%	0%	0%	100%	0%	72
Harari	15	0%	80%	13%	7%	0%	6	6	0%	0%	17%	67%	17%	72
Addis Ababa	151	1%	75%	17%	4%	3%	6	51	10%	10%	33%	43%	4%	48
Dire Dawa	21	0%	62%	14%	19%	5%	6	6	0%	0%	17%	83%	0%	72
Facility type														
Referral/specialized hospitals	30	3%	77%	7%	10%	3%	6	30	10%	0%	17%	67%	7%	72
General hospitals	103	2%	51%	19%	24%	3%	6	101	14%	7%	18%	37%	25%	72
Primary hospitals	160	5%	51%	22%	21%	2%	6	122	9%	3%	8%	43%	37%	72
MCH specialty centres	23	4%	48%	43%	4%	0%	6	17	6%	12%	47%	35%	0%	48
Health centres	3,459	4%	39%	14%	38%	5%	12	37	35%	11%	5%	16%	32%	48
MCH specialty clinics	16	6%	69%	19%	6%	0%	6	3	0%	0%	0%	100%	0%	72
Higher clinics	13	8%	69%	8%	15%	0%	6	2	0%	0%	50%	50%	0%	60
Managing authority														
Public/government	3,662	4%	39%	14%	37%	5%	12	232	15%	4%	8%	38%	35%	72
Private-for-profit	83	5%	54%	27%	11%	4%	6	63	10%	8%	33%	46%	3%	60
Private-not-for-profit[2]	59	7%	53%	14%	24%	3%	6	17	6%	6%	24%	53%	12%	72
Location														
Urban	1,497	3%	49%	16%	30%	3%	6	283	12%	5%	15%	42%	27%	72
Rural	2,307	5%	34%	14%	41%	6%	12	29	28%	10%	7%	24%	31%	72

[1] Median duration for post-caesarean stay based on 2 facilities. [2] Includes NGO, faith-based, or mission facilities.

5.3 Policy environment and respectful maternity care

User fees can have a positive effect on the managment of health facilities by increasing the funds available to the facility; they can also have a negative effect by deterring poor clients from using services. The solution therefore are user fees with exemption schemes for vulnerable people, allowing some increase in funds to supplement inadequate facility budgets. In any case, health facilities should clearly display their fees for service, if they charge for any services. This improves accountability and helps clients calculate the costs they will incur in seeking services.

Formal service fees

Figure 5.3.1 and Table 5.3.1 summarise information on facilities that charge routine user fees for services. Sixty-three percent of facilities routinely requested clients to pay a formal fee before providing services / treatment. Ninety percent of private-for-profit facilities charged for general services; the same was true for private-for-not-profit and government facilities (59 and 62 percent, respectively). These percentages may be low due to the question having been asked in the maternal and newborn service area, and the provider may have assumed that the question referred only to the maternal and newborn care.

Overall, 6 percent of the facilities charged for normal delivery. Thirty-four percent of facilities in Addis Ababa and none of the facilities in Afar region requested user fees for normal delivery service. Government facilities (4 percent) were the least likely to charge women for normal delivery or for the purchase of supplies or medicines for normal delivery (2 percent).

Three percent of the facilities required payment before treatment of an obstetric/gynaecological emergency. Health centres were the least likely to request a payment for treatment of an obstetric/gynaecological emergency or for medicines or supplies (1 and 2 percent, respectively). Thirty-eight percent of facilities had a fee schedule for services posted in a visible and public place.

Figure 5.3.1: Percent of facilities that charge formal service fees and expect women to pay for medicines and supplies, by region, Ethiopia EmONC, 2016

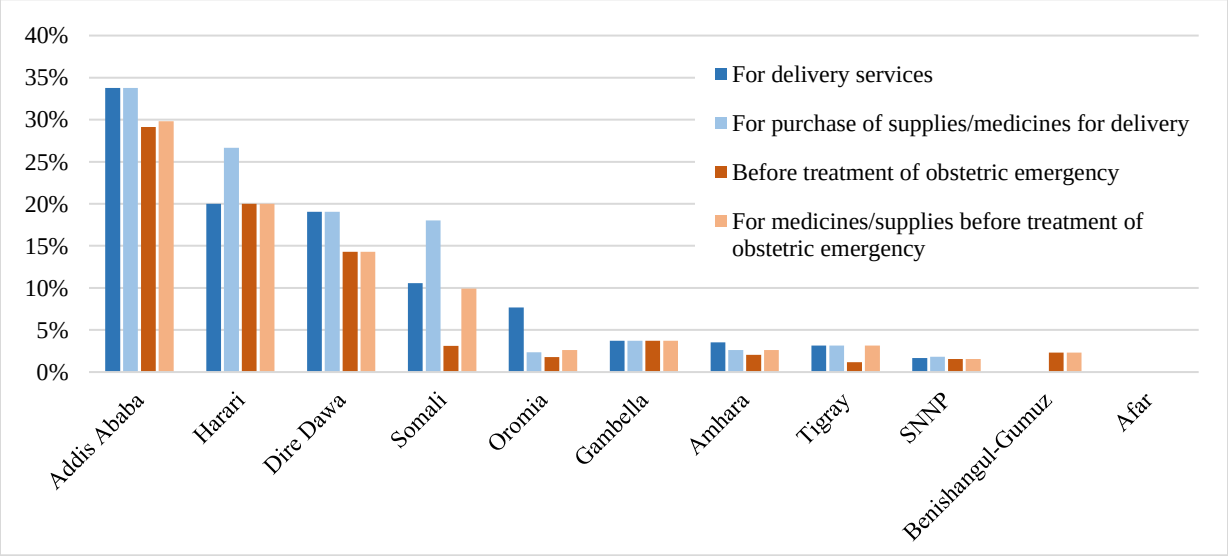


Table 5.3.1: Percent of facilities that charge formal service fees and expect women to pay for medicines and supplies, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

		Percent of facilities requiring formal payment:					
	Number of facilities	Before receiving services in general	For delivery services	For purchase of supplies/ medicines for delivery	Before treatment of obstetric emergency	For medicines/ supplies before treatment of obstetric emergency	Fee schedule posted in a visible and public place
National	3,804	63%	6%	4%	3%	4%	38%
Region							
Tigray	255	56%	3%	3%	1%	3%	36%
Afar	77	25%	0%	0%	0%	0%	17%
Amhara	876	68%	4%	3%	2%	3%	46%
Oromia	1,405	63%	8%	2%	2%	3%	29%
Somali	161	72%	11%	18%	3%	10%	18%
Benishangul-Gumuz	43	88%	0%	0%	2%	2%	51%
SNNP	773	58%	2%	2%	2%	2%	50%
Gambella	27	30%	4%	4%	4%	4%	19%
Harari	15	73%	20%	27%	20%	20%	13%
Addis Ababa	151	72%	34%	34%	29%	30%	54%
Dire Dawa	21	90%	19%	19%	14%	14%	5%
Facility type							
Referral/specialized hospitals	30	70%	13%	10%	17%	20%	37%
General hospitals	103	72%	40%	43%	35%	38%	45%
Primary hospitals	160	68%	11%	11%	8%	10%	46%
MCH specialty centres	23	87%	91%	91%	70%	70%	48%
Health centres	3,459	62%	4%	2%	1%	2%	37%
MCH specialty clinics	16	75%	88%	81%	50%	50%	56%
Higher clinics	13	85%	77%	77%	46%	62%	69%
Managing authority							
Public/government	3,662	62%	4%	2%	1%	2%	37%
Private-for-profit	83	90%	98%	98%	67%	75%	51%
Private-not-for-profit[1]	59	59%	34%	36%	25%	34%	51%
Location							
Urban	1,497	68%	10%	9%	6%	7%	41%
Rural	2,307	59%	3%	2%	1%	2%	36%

[1] Includes NGO, faith-based, or mission facilities.

Fee waivers

Nationally, only small percentages of facilities charged women separately for a bed, food for pregnant or recently delivered women, blood transfusions or formula milk (1 to 4 percent) (Table 5.3.2A in the Appendix page 343). Overall, 45 percent of health facilities reported having a formal system to waive fees for poor women, 17% an informal system. When examined by management sector, we see that most government facilities (46 percent) had a formal system, and 23 percent of private-for-profit facilities had a formal system.

Cost and payment policies

In Ethiopia, the average card fee was 40 birr (Table 5.3.3A in the Appendix page 344). Facilities charged an average of 4,750 birr for caesarean delivery, 2,024 birr for assisted vaginal delivery, 975 birr for neonatal special care unit per day, 598 birr for a safe abortion, and 441 birr for post-abortion care. Government facilities charged less than the private facilities (the only exception was oxytocin injection) and urban facilities charged more than rural facilities for all services. It should be noted that some of these mean costs were based on very few facilities.

Policy for the review of maternal and newborn deaths

Thirty and 39 percent facilities had a routine system for maternal death audit or case review or routine newborn death/stillbirth audits or case reviews, respectively (Table 5.3.4). Almost two-thirds of facilities (64 percent) had implemented the maternal death surveillance and response initiative and had an established committee. Somali (10 percent) and Gambella (11 percent) facilities lagged far behind the national figure, as did private-for-profit facilities. Only 22 percent of facilities reported that they registered the causes of maternal deaths; but this is based on all facilities and most facilities did not experience maternal deaths, which was a response option.

Table 5.3.4: Percent of facilities that review maternal and newborn cases, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Routine maternal death audits or case reviews	MDSR initiative implemented	Implemented MDSR and had committee	Maternal deaths registered by cause	Routine newborn death/stillbirth audits or case reviews	Routine near miss reviews
National	3,804	30%	69%	64%	22%	39%	29%
Region							
Tigray	255	55%	94%	93%	40%	70%	56%
Afar	77	19%	29%	25%	8%	19%	43%
Amhara	876	33%	78%	74%	24%	36%	31%
Oromia	1,405	29%	67%	63%	21%	37%	28%
Somali	161	14%	16%	10%	18%	24%	19%
Benishangul-Gumuz	43	40%	30%	23%	19%	58%	37%
SNNP	773	25%	72%	66%	15%	37%	20%
Gambella	27	4%	15%	11%	0%	26%	11%
Harari	15	53%	60%	60%	67%	27%	0%
Addis Ababa	151	38%	70%	66%	26%	50%	40%
Dire Dawa	21	67%	76%	76%	43%	48%	0%
Facility type							
Referral/specialized hospitals	30	90%	80%	79%	83%	63%	70%
General hospitals	103	63%	69%	62%	62%	67%	60%
Primary hospitals	160	52%	70%	66%	43%	65%	60%
MCH specialty centres	23	30%	26%	13%	22%	57%	43%
Health centres	3,459	28%	69%	65%	19%	36%	26%
MCH specialty clinics	16	6%	0%	0%	6%	13%	19%
Higher clinics	13	23%	0%	0%	23%	38%	38%
Managing authority							
Public/government	3,662	31%	70%	66%	21%	38%	29%
Private-for-profit	83	27%	24%	13%	29%	43%	37%
Private-not-for-profit[1]	59	32%	36%	34%	24%	53%	39%
Location							
Urban	1,497	35%	72%	68%	27%	44%	35%
Rural	2,307	27%	66%	62%	18%	35%	25%

MDSR = maternal death surveillance and response.

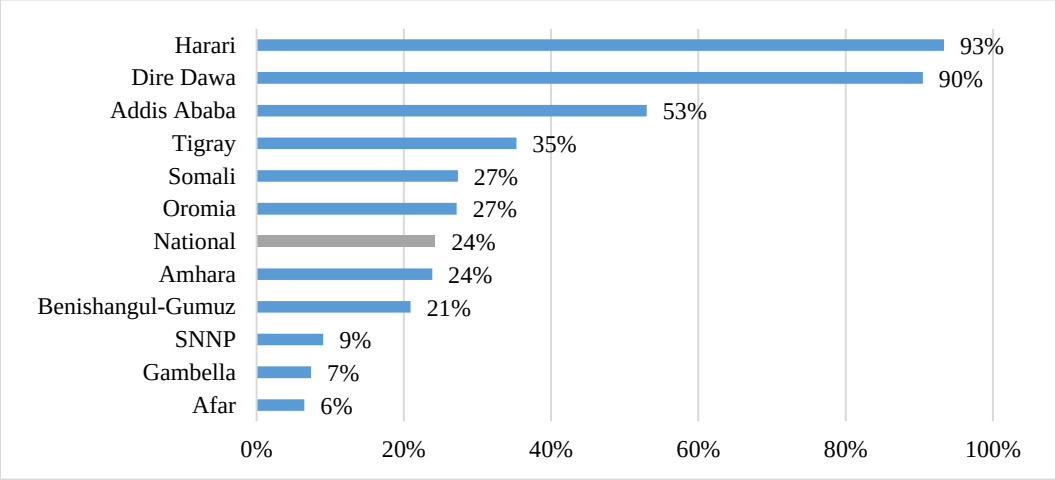
[1] Includes NGO, faith-based, or mission facilities.

Other policies related to maternal and newborn services

One-third of facilities reported frequent staff rotation for maternal and newborn care (Table 5.3.5A in the Appendix page 345). Frequent rotation is a problem when specially trained nurses are rotated to non MNH departments. Staff reported that women were allowed to choose a companion of her choice during labour and during delivery in 91 and 76 percent of facilities. Most facilities allowed women to walk around during labour (97 percent) and almost two-thirds (63 percent) encouraged women to choose their preferred position

during labour and delivery. Only about a quarter of facilities had a system for registering the birth of their baby on-site (Civil Registration System) (Figure 5.3.2).

Figure 5.3.2: Percent of facilities where families can register the birth of their baby on-site (Civil Registration System), by region, Ethiopia EmONC, 2016



Respectful care (privacy and comfort)

Figure 5.3.3 and Table 5.3.6 indicate that referral and specialized hospitals, more than other types of facilities, experienced the need for women to share beds before or after delivery (13 percent), to sleep on the floor (30 percent), or to deliver on the floor (20 percent) in the last 3 months. Facilities in Harari region (20 percent) were the most likely to have shared beds before or after delivery and facilities in Tigray region (13 percent) were the most likely to have had clients who delivered on the floor. On average, about eight out of every ten facilities (83 percent) had curtains for client privacy.

Figure 5.3.3: Percent of facilities according to selected concerns regarding respectful maternity care, by facility type, Ethiopia EmONC, 2016

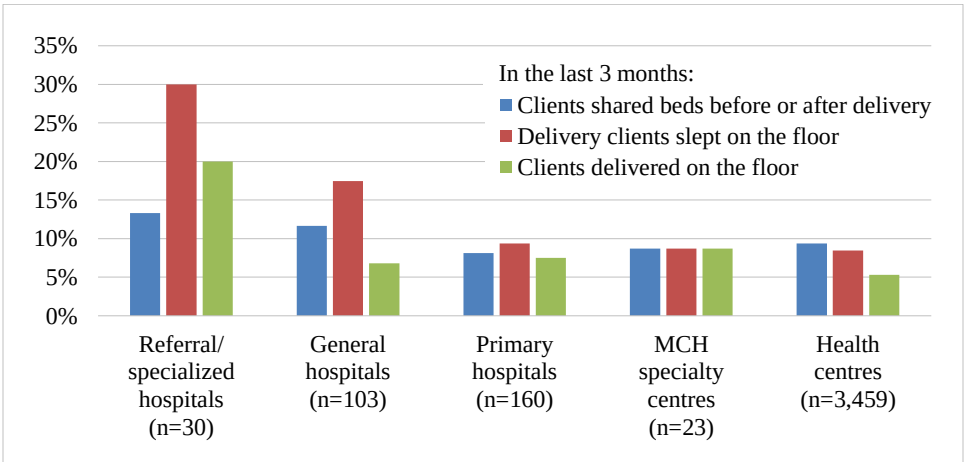


Table 5.3.6: Percent of facilities according to selected concerns regarding respectful maternity care, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Curtains for client privacy	In the last 3 months were there: Clients who shared beds before or after delivery	Delivery clients who slept on the floor	Clients who delivered on the floor
National	3,804	83%	9%	9%	6%
Region					
Tigray	255	92%	8%	11%	13%
Afar	77	83%	1%	0%	6%
Amhara	876	82%	9%	8%	4%
Oromia	1,405	84%	8%	7%	4%
Somali	161	78%	10%	7%	3%
Benishangul-Gumuz	43	84%	7%	5%	7%
SNNP	773	78%	14%	15%	8%
Gambella	27	74%	4%	7%	4%
Harari	15	93%	20%	0%	0%
Addis Ababa	151	97%	6%	3%	5%
Dire Dawa	21	90%	5%	10%	0%
Facility type					
Referral/specialized hospitals	30	87%	13%	30%	20%
General hospitals	103	97%	12%	17%	7%
Primary hospitals	160	89%	8%	9%	8%
MCH specialty centres	23	100%	9%	9%	9%
Health centres	3,459	82%	9%	8%	5%
MCH specialty clinics	16	100%	6%	0%	0%
Higher clinics	13	92%	8%	0%	0%
Managing authority					
Public/government	3,662	83%	10%	9%	6%
Private-for-profit	83	99%	5%	5%	5%
Private-not-for-profit[1]	59	91%	9%	2%	5%
Location					
Urban	1,497	88%	10%	9%	6%
Rural	2,307	80%	9%	9%	5%

[1] Includes NGO, faith-based, or mission facilities.

5.4 Comparisons between 2008 and 2016

The government has taken a wide range of measures to improve the health status of the population. Numerous health sector policies and programs have been developed and aggressively implemented. A national health policy was adopted in the early 1990s and strategies focused on nutrition, child survival and infant and young child feeding were endorsed subsequently. Innovative programs and interventions have been developed and implemented to translate the policies and strategies into action. It is difficult to say that

changes in health outcomes are due to any one initiative without conducting rigorous research that measures their impact.

The comparison of select indicators shows remarkable improvement, for example, only 5 percent of facilities reported having cervical cancer screening in 2008. In 2016, the percentage had tripled to 16%. Payment required before treatment of an obstetric emergency was 19% in 2008 and dropped to 3% in 2016 (Figure 5.4.1). Duration of stay postpartum increased between the two surveys, especially at health centres (Table 5.4.1). Facilities increased their commitment to carrying out routine maternal death reviews or audits and their public display of a fee schedule.

Figure 5.4.1: Percent of facilities that provided key services, carried out specific practices, and implemented cost-related policies in 2008 and 2016, Ethiopia EmONC, 2016

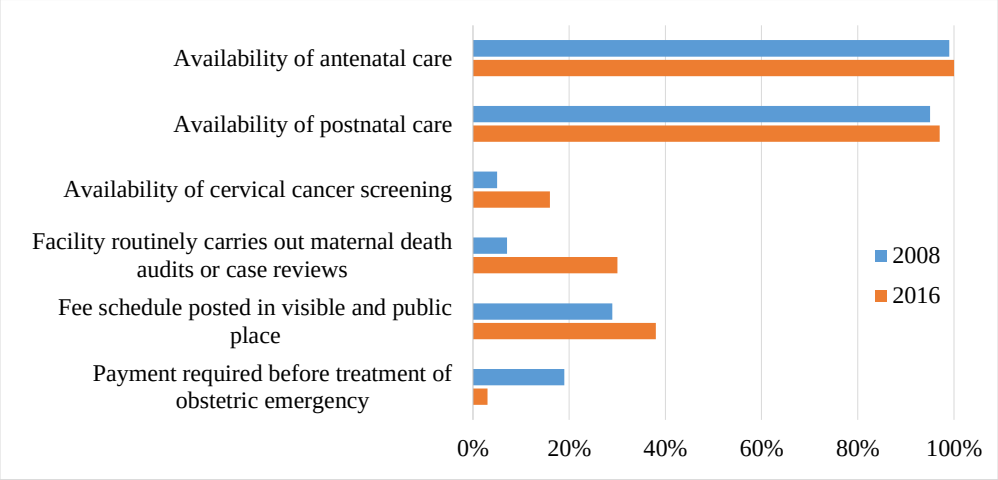


Table 5.4.1: Percent of facilities that provided key services, carried out specific practices, and implemented cost-related policies in 2008 and 2016, by facility type and managing authority, Ethiopia EmONC, 2016

	All facilities		Facility type				Managing authority					
			Hospitals/MCH specialty centres		Health centres/clinics[1]		Public/government		Private-for-profit		Private-not-for-profit[2]	
	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016
Total number of facilities (n)	797	3,804	112	316	685	3,488	750	3,662	27	83	20	59
Availability of the following services												
Antenatal care	99%	100%	98%	99%	99%	100%	100%	100%	94%	96%	100%	100%
Postnatal care	95%	97%	97%	99%	95%	97%	98%	97%	100%	98%	100%	100%
Cervical cancer screening	5%	16%	31%	61%	1%	12%	3%	14%	88%	80%	11%	36%
Duration of stay postpartum for routine delivery (hours)												
Median	6	12	6	6	6	12	6	12	12	6	6	6
Mean	7	15	11	11	6	16	7	16	15	11	13	12
Facility routinely carries out maternal death audits or case reviews	7%	30%	35%	58%	2%	28%	7%	31%	18%	27%	16%	32%
Fee schedule posted in visible and public place	29%	38%	34%	45%	28%	37%	29%	37%	29%	51%	26%	51%
Payment required before treatment of obstetric emergency	19%	3%	38%	22%	16%	1%	17%	1%	71%	67%	37%	25%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Chapter 6: Facility Infrastructure and Communication

Key Findings

- The MOH has constructed a remarkable number of new facilities over the past 8 years, but gaps remain in the number of primary hospitals and rural health centres if Ethiopia is to meet its own standards of facilities to population size.
- Referral hospitals and health centres had only half the number of maternity beds they need when compared to international standards.
- Proportionately, more health centres had at least one mode of communication in 2008 than 2016 (58 vs. 31 percent), likely due to the five-fold increase in the number of health centres.
- Eighty-eight percent of facilities had a source of electricity, 63 percent of which had power from the grid, an improvement since 2008.
- Nationally, 22 percent of facilities reported no water source; more than half of the facilities in Afar had no source of water.
- Nearly all facilities (97 percent) had an HMIS system and compiled monthly reports on maternal and newborn services. Somali region had the lowest percentage of facilities with a data collection system in place.

Infrastructure is essential when building and maintaining a health system. Virtually all fields of medicine require sufficient numbers of facilities with adequate physical conditions that are functional and welcoming. Maternal and newborn services are no exception.

6.1 Ratio of facilities to population

For planning and programming, the Ethiopian health sector organizes itself around a hierarchical system that ranges from community-based services to the highest level of specialized services, and encompasses both public and private facilities. Levels of care often are guided by the population size they are expected to cover. In Ethiopia, the government has organized its health system as follows[35]:

- Referral or specialized hospitals: 1 per 5,000,000 population
- General hospitals: 1 per 1,500,000 population
- Primary hospitals: 1 per 100,000 population
- Urban health centres: 1 per 40,000 population
- Rural health centres: 1 per 20,000 population

[35] Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). Health Sector Transformation Plan: 2015/16 - 2019/20. Addis Adaba, Ethiopia: FMOH, 2015. The EmONC assessment does not cover health posts, the link closest to communities, and therefore they are not addressed in this report.

Although these standards were devised for all medical areas and not just maternal and newborn services, we applied these standards to the facilities covered in the EmONC assessment. The results are found in Table 6.1.1. Briefly, the standards were met for referral hospitals (with 11 referral hospitals in excess), for general hospitals (2 in excess), and for urban health centres (714 in excess). Gaps were found for primary hospitals (gap of 778) and rural health centres (gap of 1,449). To put these numbers in historical context, at the time of the 2008 EmONC assessment, which was also a census of facilities that provided delivery services, the number of hospitals was 112 and health centres 639[36]. In 2016, hospitals/MCH specialty centres had increased to 316, almost tripling in number, while health centres, MCH specialty clinics and higher clinics quadrupled to 3,488.

[36] Subsequently the assessment team learned of a few facilities that should have been included in the assessment, but were not on the government list of accredited facilities and therefore were not included in the list of eligible facilities.

Table 6.1.1: Recommended number and actual number of public/government facilities, by region and location, Ethiopia EmONC, 2016

	Population			Number of facilities recommended by National Standards[1]					Actual number of government facilities[2]					Surplus (gap)				
	Total	Urban	Rural	Referral hospitals	General hospitals	Primary hospitals	Health centres (urban)	Health centres (rural)	Referral hospitals	General hospitals	Primary hospitals	Health centres (urban)	Health centres (rural)	Referral hospitals	General hospitals	Primary hospitals	Health centres (urban)	Health centres (rural)
National	92,085,000	17,829,733	74,255,267	18	61	921	446	3,713	29	63	143	1,160	2,264	11	2	(778)	714	(1,449)
Region																		
Tigray	5,151,000	1,287,750	3,863,250	1	3	52	32	193	3	14	20	56	155	2	11	(32)	24	(38)
Afar	1,768,000	316,472	1,451,528	0	1	18	8	73	0	1	5	30	39	0	0	(13)	22	(34)
Amhara	20,771,000	3,364,902	17,406,098	4	14	208	84	870	5	5	40	275	539	1	(9)	(168)	191	(331)
Oromia	34,575,000	5,013,375	29,561,625	7	23	346	125	1,478	7	18	35	430	886	0	(5)	(311)	305	(592)
Somali	5,599,000	811,855	4,787,145	1	4	56	20	239	0	6	3	40	103	(1)	2	(53)	20)	(136)
B-Gumuz	1,035,000	208,035	826,965	0	1	10	5	41	0	2	0	20	19	0	1	(10)	15	(22)
SNNP	18,720,000	2,920,320	15,799,680	4	12	187	73	790	4	10	39	198	495	0	(2)	(148)	125	(295)
Gambella	422,000	136,306	285,694	0	0	4	3	14	0	1	0	2	23	0	1	(4)	(1)	9
Harari	238,000	132,328	105,672	0	0	2	3	5	1	3	0	6	2	1	3	(2)	3	(3)
Addis Ababa	3,353,000	3,353,000	0	1	2	34	84	0	8	2	0	91	0	7	0	(34)	7	0
Dire Dawa	453,000	285,390	167,610	0	0	5	7	8	1	1	1	12	3	1	1	(4)	5	(5)
Location[3]																		
Urban	17,864,490	17,864,490		4	12	178	446	0	29	59	130	1,160	0	25	47	(48)	714	0
Rural	75,141,360		75,141,360	15	50	743	0	3,713	0	4	13	0	2,264	(15)	(46)	(730)	0	(1,449)

[1] National Standards: 1 referral/specialized hospital per 5 million population, 1 general hospital per 1.5 million population, 1 primary hospital per 100,000 population, 1 urban health centre per 40,000 population, 1 rural health centre per 20,000 population. Source: FMOH, Health Sector Transformation Plan: 2015/16 - 2019/20, Addis Ababa, Ethiopia: FMOH, 2015.

[2] Excludes 1 public/government MCH specialty centre and 2 public/government higher clinics, as there are no national population coverage standards for those facility types.

[3] The sum of urban and rural facilities does not always reflect the number in the national row due to rounding.

6.2 Number and ratio of beds to deliveries

The number of beds is used often as a criterion for classifying health facilities. According to 2012 national standards, referral or specialized hospitals should have 300 beds, general hospitals 100, primary hospitals 35, health centres 10, and specialized MCH centres 12[37].

Table 6.2.1A (see Appendix page 346) allows a comparison between these standards and the mean number of beds by type of facility. In general, most facilities were close to adhering to these standards: referral or specialized hospitals had on average 273 beds, general hospitals 96 beds, primary hospitals 50, MCH specialty centres 21, and health centres 9. Primary hospitals presented the greatest positive deviation with 50 beds instead of 35, while referral hospitals had the greatest negative deviation with an average of only 273 beds instead of 300. Government standards for MCH specialty clinics and higher clinics do not exist.

Table 6.2.1A on page 346 also shows the absolute number of beds regardless of department (total of 57,706) and the number of beds related to maternity care (35,871). The maternity beds were further classified as obstetric and gynaecological beds (antenatal, postpartum, post-operative, post abortion, etc. – a total of 21,186), beds/couches for the 1st stage of labour (6,285), and delivery beds/couches for 2nd stage of labour (8,400). To facilitate comparisons, the number of beds was compared to 1,000 deliveries. In 2008, these figures were 17,770 (all departmental beds), 3,948 beds (maternity beds), and 1,717 (delivery beds/couches). Thus, as new facilities were constructed and equipped, the absolute number of beds increased substantially.

With a ratio of 19 maternity beds and couches per 1,000 deliveries, the ratio fell short of the WHO standard of 30 - 32 maternity beds and couches per 1,000 deliveries[38]. A few regions met or surpassed this standard; Afar and Somali had twice the standard number of beds while Benishangul-Gumuz, Gambella, Harari, and Dire Dawa just met the standard. Amhara, Oromia, and SNNP achieved about half of the standard of 30 - 32. Among facility types, only primary hospitals met the standard; all other facility types fell short. Regarding managing authority, only private-for-profit facilities met the standard and, in fact, exceeded it at 60 beds per 1,000 deliveries.

The bed situation has deteriorated since 2008 when the overall ratio of maternity beds and couches was 32 per 1,000 deliveries, but this is likely a consequence of the rapid scale up of newly constructed facilities and the increase in deliveries in facilities. Although the absolute number of beds has increased by 225 percent since 2008, the number of beds has not kept up with the increase in facilities.

[37] Ethiopian Standard Agency. Ethiopian Standard ES 3620:2012, first edition. Addis Ababa, Ethiopia, 2012.

[38] WHO. Essential elements of obstetric care at first referral level. Geneva: 1991.

6.3 Physical infrastructure

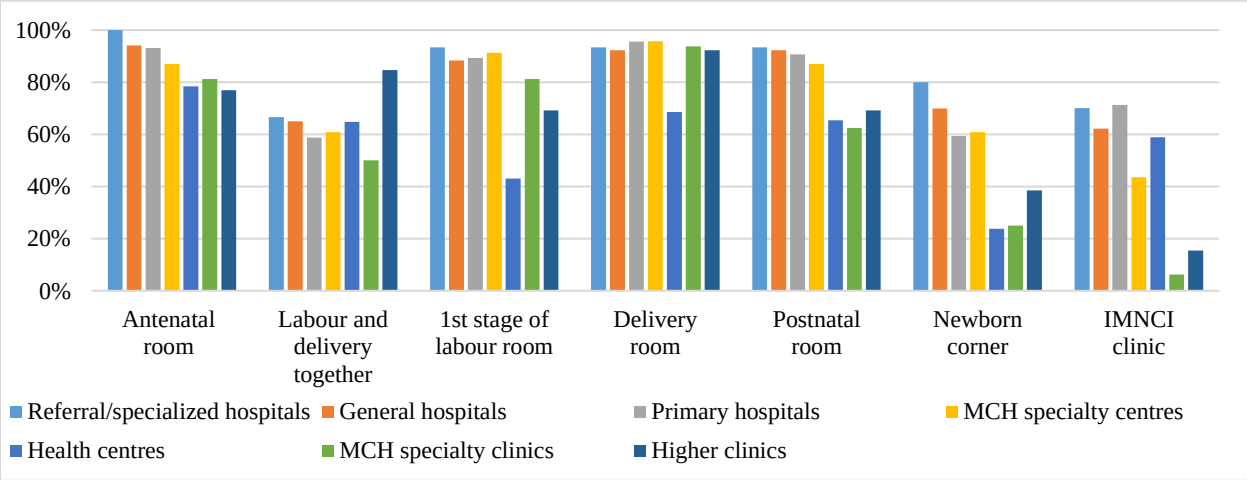
Availability of separate rooms or physical spaces for maternal and newborn health services

According to national guidelines, facilities that provide childbirth services should have a separate space allocated to antenatal care, labour, delivery, and postnatal care. The guideline is to have at least one room or space for these services (Table 5.1.1 in Chapter 5 for the percentage of facilities that provide specific services). Table 6.3.1A (see Appendix page 347) gives the percentage of facilities with a separate room or space for select maternal and newborn services by region, facility type, managing authority, and location. Eighty percent of facilities in Ethiopia had a separate room for antenatal care, 71 percent for delivery and 84 percent for laboratory services. Only 3 percent of facilities in the country had a separate room for a mini blood bank.

Regionally, facilities in Addis Ababa city administration were configured with the most separate rooms or spaces for select maternal and newborn services. The opposite was true for Gambella, which, overall, had a lower proportion of facilities with separate service areas than other regions.

Figure 6.3.1 shows how the availability of separate spaces for the delivery of specific services compared across facility type. The services selected are those that might be expected at all levels of care.

Figure 6.3.1: Percent of facilities with separate room or space for selected maternal and newborn services, by facility type, Ethiopia EmONC, 2016



Infrastructure in labour and delivery

A set of specific questions regarding the infrastructure for the labour and delivery area were addressed to the matron in charge of the maternity to determine if there was sufficient lighting to carry out tasks during the day and night (Table 6.3.2). Most facilities (95 percent) affirmed they had sufficient lighting during the day but only two-thirds of the facilities said this was true during the night. Eighty percent said they had a toilet for clients. Ventilation, heating and cooling arrangements were also investigated and 84 percent of facilities said they had a means of ventilation, 31 percent had heating arrangements, and 12 percent had air

conditioning or a functional fan. Seventy-nine percent reported they had a waiting room for family and visitors.

Table 6.3.2: Percent of facilities with the indicated infrastructure in the labour and delivery area, by region, facility type, and managing authority, Ethiopia EmONC, 2016

	Number of facilities	Sufficient light during the day	Sufficient light at night	Means of ventilation	Means of heating	Functional fan or air conditioning	Functioning toilet for client use	Functioning toilet for visitors and family use	Waiting area for visitors and family
National	3,804	95%	67%	84%	31%	12%	80%	79%	79%
Region									
Tigray	255	97%	90%	95%	35%	10%	81%	73%	80%
Afar	77	96%	69%	53%	29%	35%	79%	83%	77%
Amhara	876	93%	62%	86%	30%	14%	73%	75%	78%
Oromia	1,405	95%	59%	81%	26%	8%	79%	82%	80%
Somali	161	96%	68%	85%	20%	15%	88%	81%	82%
Benishangul-Gumuz	43	93%	77%	95%	67%	28%	100%	100%	100%
SNNP	773	95%	71%	84%	28%	9%	81%	77%	76%
Gambella	27	100%	33%	85%	22%	15%	70%	56%	81%
Harari	15	100%	93%	100%	60%	20%	87%	87%	80%
Addis Ababa	151	98%	94%	93%	78%	26%	95%	82%	89%
Dire Dawa	21	100%	95%	100%	62%	86%	95%	90%	100%
Facility type									
Referral/specialized hospitals	30	100%	90%	90%	80%	50%	90%	83%	90%
General hospitals	103	100%	98%	95%	80%	43%	91%	89%	85%
Primary hospitals	160	95%	89%	89%	66%	27%	88%	86%	91%
MCH specialty centres	23	96%	96%	96%	96%	48%	100%	91%	100%
Health centres	3,459	95%	64%	83%	26%	10%	79%	78%	78%
MCH specialty clinics	16	100%	100%	94%	63%	31%	100%	94%	100%
Higher clinics	13	92%	100%	85%	62%	8%	92%	85%	77%
Managing authority									
Public/government	3,662	95%	65%	84%	29%	11%	79%	79%	79%
Private-for-profit	83	99%	98%	95%	80%	33%	96%	92%	94%
Private-not-for-profit[1]	59	97%	92%	85%	66%	37%	95%	92%	95%

[1] Includes NGO, faith-based, or mission facilities.

6.4 Availability of electricity, water and toilets

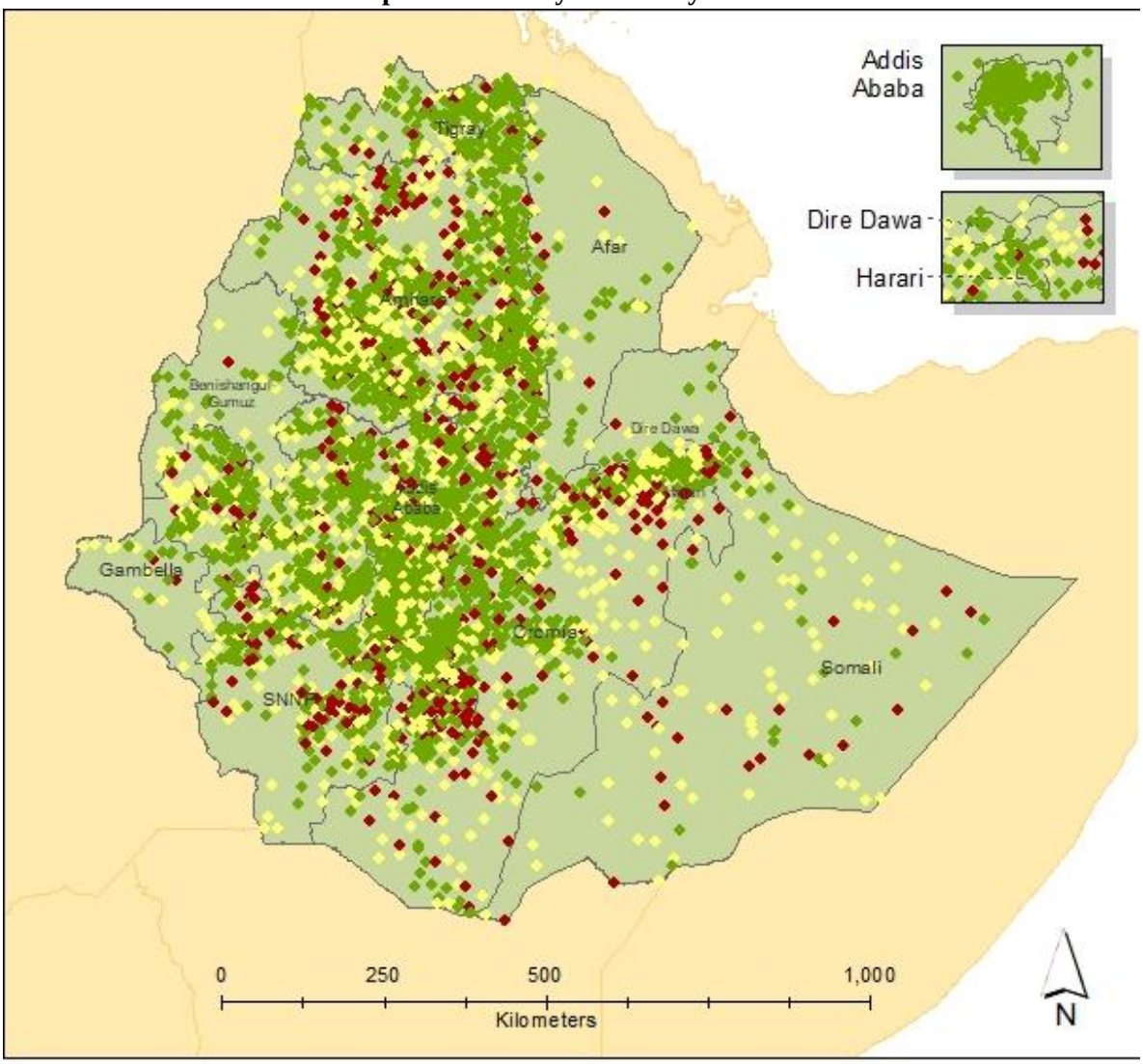
Source of electricity

The availability of electricity is critical for the provision of quality health services, the safety of clients and providers alike at all facility levels, and is essential for the operation of equipment whose failure undermines the delivery of health services. Health facilities' access to electricity was assessed, as were power sources and whether the electricity was functioning on the day of the assessment.

Table 6.4.1 findings show that 88 percent of health facilities had an electric power source and among these, 63 percent used electric power from the national grid while 42 percent and 36 percent had backup power from a fuel-operated generator or solar power, respectively. Harari and Addis Ababa city administrations had the highest coverage of electricity from the national grid (100 percent) while Somali region had the lowest coverage (37 percent). Facilities in Dire Dawa (86 percent) and Addis Ababa (83 percent) had the highest percentage of backup fuel-operated generators and Tigray region had the lowest (20 percent). In addition, Gambella region had the highest backup coverage of solar power (76 percent) while Addis Abba had the lowest percentage. Among facilities with a generator, 86 percent of all facilities' generators were functional on the day of the survey, ranging from 100 percent in Gambella to 73 percent in Harari. Addis Ababa had the highest percentage of facilities with automatically operated generators (54 percent) while Afar had the fewest facilities with automatic generators (6 percent).

In terms of facility type, health centres had the least coverage of electricity (60 percent) from the national grid and among those with generators, only 8 percent had automatically operated generators. All referral hospitals and MCH specialty centres had fuel-operated generators unlike other types of facilities. Government health facilities had the lowest coverage (14 percent) of automatically operated generators compared with 54 percent of private-for-profit facilities. Similarly, fewer rural facilities had power from the grid than urban health facilities (46 percent vs. 88 percent).

Map 6.4.1: Facility Electricity Sources



Electricity Source
- no electricity
- generator and/or solar only (no grid)
- grid (with or without backup)
- Regions

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
*EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Table 6.4.1: Percent of facilities with any source of electricity, and among those, percent with power from grid, backup source, and functionality of generator, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Has a source of electricity	Has electricity from the grid[1]	Among facilities with any source of electricity, has backup power available (in addition to grid)			Among facilities with a generator	
				Generator, fuel-operated	Generator, battery-operated	Solar	Functional on day of survey	Comes on automatically when needed
National	3,804	88%	63%	42%	2%	36%	86%	17%
Region								
Tigray	255	96%	81%	20%	1%	31%	94%	17%
Afar	77	88%	60%	24%	0%	49%	94%	6%
Amhara	876	88%	61%	53%	2%	32%	85%	17%
Oromia	1,405	87%	61%	37%	1%	34%	81%	12%
Somali	161	84%	37%	56%	11%	65%	90%	9%
Benishangul-Gumuz	43	98%	60%	67%	2%	24%	93%	7%
SNNP	773	87%	62%	34%	2%	44%	86%	13%
Gambella	27	93%	44%	24%	0%	76%	100%	17%
Harari	15	100%	100%	73%	0%	7%	73%	36%
Addis Ababa	151	100%	100%	83%	7%	5%	95%	54%
Dire Dawa	21	100%	76%	86%	5%	24%	89%	17%
Facility type								
Referral/specialized hospitals	30	100%	100%	100%	7%	7%	100%	80%
General hospitals	103	99%	98%	96%	13%	7%	99%	53%
Primary hospitals	160	99%	94%	94%	4%	10%	97%	38%
MCH specialty centres	23	100%	100%	100%	4%	9%	96%	65%
Health centres	3,459	87%	60%	36%	1%	39%	82%	8%
MCH specialty clinics	16	100%	100%	88%	0%	13%	100%	36%
Higher clinics	13	100%	92%	85%	23%	23%	100%	33%
Managing authority								
Public/government	3,662	88%	62%	40%	2%	36%	84%	14%
Private-for-profit	83	98%	98%	98%	9%	4%	100%	54%
Private-not-for-profit[2]	59	95%	90%	84%	11%	29%	98%	50%
Location								
Urban	1,497	97%	88%	60%	3%	20%	87%	24%
Rural	2,307	83%	46%	29%	1%	48%	83%	6%

[1] The difference between 'has a source of electricity' and 'has electricity from the grid' is the percent of facilities with electricity whose source is either a generator, solar power, or other.

[2] Includes NGO, faith-based, or mission facilities.

Interruptions in electricity

Health facilities were investigated further for a continuous supply of electricity to perform their services. Table 6.4.2A (page 348 in the Appendix) shows the extent of electricity interruption at national and regional levels, by type of facility, managing authority, and location of health facilities.

Only 18 percent of visited health facilities with a source of electricity had a continuous supply of electricity at national level, while 8 percent reported having interruptions for ≤2 hours in the 7 days prior to the survey, 65 percent had interruptions for >2 hours, and 9 percent had had no electricity for the preceding 7 days. Among the regions, 40 percent of facilities in Harari had a continuous supply of electricity, the highest among all regions. In Gambella, on the other hand, only 4 percent of facilities with a source of electricity reported an uninterrupted supply of electricity. Among the facilities in Afar that reported having a source of electricity (88 percent), more than one in four (28 percent) had had no electricity for more than 7 days at the time of the assessment.

The findings related to facility type showed that among facilities with a power supply, no interruptions in electric power ranged from 17 percent of health centres to 57 percent of referral hospitals. Government facilities suffered the most from interruptions and private-not-for-profit facilities the least. Government facilities with a power source reported only 18 percent had a continuous supply of electricity; 8 percent had interruptions for ≤2 hours; 66 percent had interruptions for >2 hours and 9 percent had no electricity in the 7 days prior to the survey. Similarly, rural facilities suffered from interruption of electricity more than urban facilities.

Functioning electricity in separate physical spaces where maternal and newborn health services are delivered

The survey results show that the presence of functioning electricity in service delivery areas varied widely, depending on the space (Table 6.4.3A in the Appendix page 349). For example, 97 percent of facilities with a general operating theatre reported electricity in that area; in contrast, only 70 percent of facilities with a separate room for antenatal care had electric power in that area. Gambella region stood out as proportionately having the fewest facilities with functioning electricity in spaces where labour and delivery were joined in the same room (37 percent). Somali facilities also reported large gaps in functioning electricity in lab rooms (68 percent of facilities) and half of mini blood bank rooms. Regarding facility types, MCH specialty centres and clinics proportionately had the fewest special area rooms without electricity.

Nationally, nearly all (97 percent) facilities with an intensive care unit (ICU) reported functioning electricity in the ICUs (Table 6.4.4A in the Appendix page 350). IMNCI rooms with functioning electricity, on the other hand, were found in 71 percent of the facilities that had an IMNCI clinic. Somali, Gambella and Dire Dawa administrative city had the smallest proportion of facilities with functioning electricity for IMNCI rooms (50 percent). In general, ICUs and newborn care areas had adequate supplies of functioning electricity in most regions and in most facility types. On the other hand, government facilities and facilities in rural areas had the least coverage of functioning electricity in IMNCI rooms when compared to private-for-profit and urban facilities.

Source of water

Water is essential for life and a key amenity of any health facility at all levels. It is used for infection control and prevention, drinking, bathing, laundry, and cooking. Health facilities in Ethiopia were assessed for the different sources of water available in each investigated facility.

Figure 6.4.1 and Table 6.4.5A (see Appendix page 351) show that nationally 53 percent reported that their primary source of water was piped water but 22 percent of all the facilities had no source of water. In Afar region 51 percent of the facilities had no water source whereas almost all facilities in Addis Ababa reported piped water as their source. Health facilities in Gambella (19 percent) and Somali (35 percent) were the regions with the smallest percentages of facilities with piped water. Unlike facilities in other regions, more than half of facilities in Gambella (56 percent) reported that their main source of water was the hand pump.

Figure 6.4.1: Percent distribution of facilities according to their primary source of water, Ethiopia EmONC, 2016

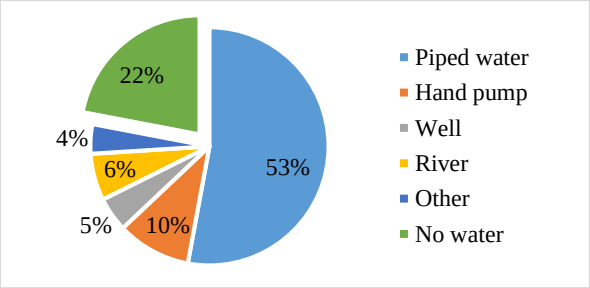


Table 6.4.6 indicates that three-fourths of all facilities had water on-site or within the compound. Water located more than 500 metres away is considered something of a hardship. The region with the largest proportion of facilities with water at this distance was Somali (33 percent). Figure 6.4.2 highlights how widespread shortages of longer than 24 hours were, even in Addis Ababa facilities.

Figure 6.4.2: Percent distribution of facilities according to whether or not they experienced a water shortage ≥24 hours in the past 3 months, by region, Ethiopia EmONC, 2016

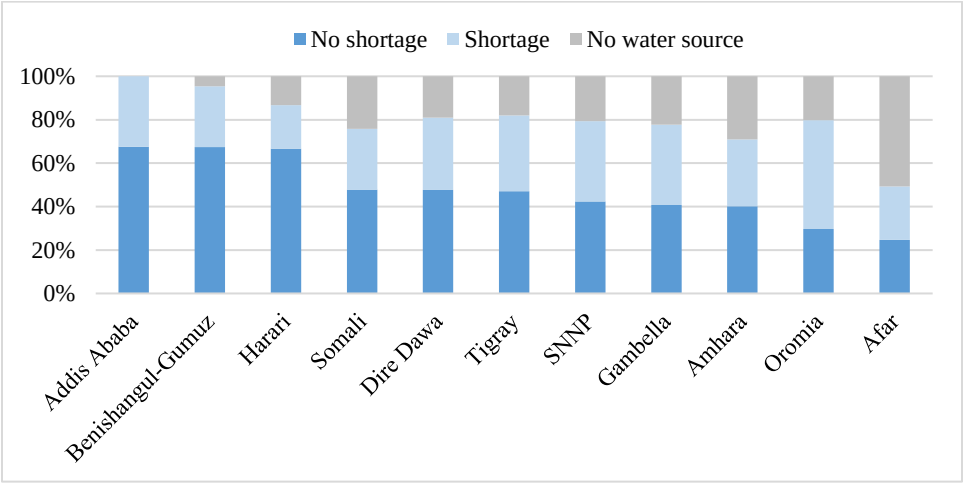
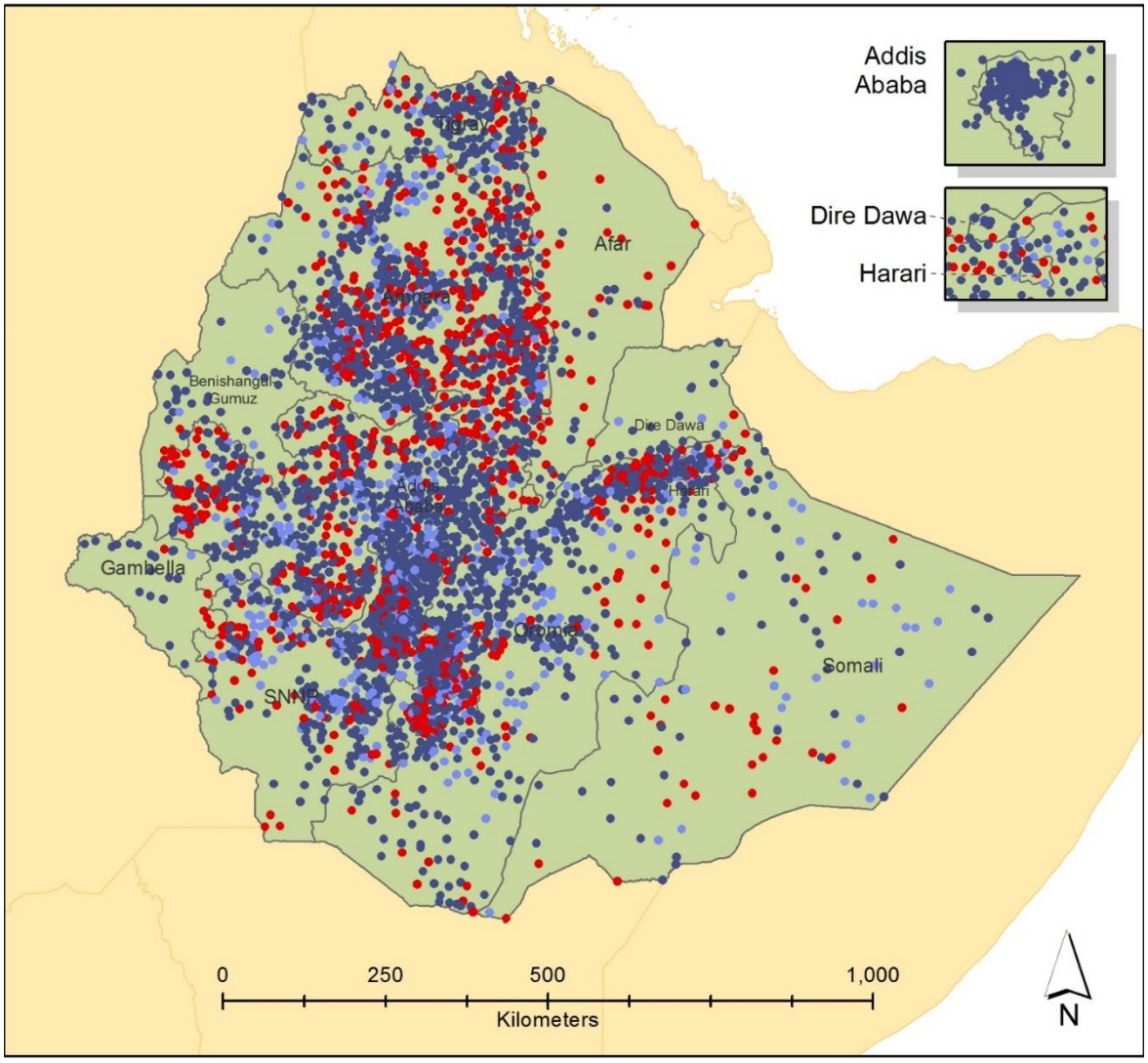


Table 6.4.6: Percent distribution of facilities with a water source according to proximity of water source, and percent of facilities with shortage ≥24 hours in the past 3 months, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with a water source	Proximity of water source				Shortage for ≥24 hours in past 3 months
		On-site/ within compound	Within 500 meters	Beyond 500 meters	Total	
National	2,967	76%	7%	17%	100%	50%
Region						
Tigray	209	75%	7%	18%	100%	43%
Afar	38	92%	8%	0%	100%	50%
Amhara	621	75%	9%	16%	100%	43%
Oromia	1,121	80%	4%	17%	100%	63%
Somali	122	59%	8%	33%	100%	37%
Benishangul-Gumuz	41	54%	22%	24%	100%	29%
SNNP	613	70%	10%	20%	100%	47%
Gambella	21	71%	24%	5%	100%	48%
Harari	13	92%	0%	8%	100%	23%
Addis Ababa	151	99%	0%	1%	100%	32%
Dire Dawa	17	100%	0%	0%	100%	41%
Facility type						
Referral/specialized hospitals	30	100%	0%	0%	100%	30%
General hospitals	99	95%	1%	4%	100%	37%
Primary hospitals	152	96%	1%	3%	100%	52%
MCH specialty centres	23	100%	0%	0%	100%	26%
Health centres	2,635	74%	8%	18%	100%	51%
MCH specialty clinics	16	100%	0%	0%	100%	25%
Higher clinics	12	83%	0%	17%	100%	25%
Managing authority						
Public/government	2,830	76%	7%	17%	100%	51%
Private-for-profit	79	97%	0%	3%	100%	33%
Private-not-for-profit[1]	58	88%	5%	7%	100%	38%
Location						
Urban	1,382	87%	4%	9%	100%	51%
Rural	1,585	67%	9%	24%	100%	50%

[1] Includes NGO, faith-based, or mission facilities.

Map 6.4.2: Facility Water Sources



Water Source

- No water
- Unimproved - river, surface water, vendor/tanker service
- Improved - piped water, rainwater, borehole, well

Regions

Date of Map Production: July 10, 2017

Data Sources
Administrative Boundaries: GADM and Map East Africa
EmONC Assessment: EPHI, 2016*
**EmONC Assessment facility case statistic data were collected for Gregorian Calendar Year 2015.*

The administrative boundary designations presented on this map do not express any opinion on the part of Ethiopian Public Health Institute or the Ministry of Health concerning the legal status of any city, region, or country.

Tank for water storage

Facilities were assessed for the availability of a water tank to reserve water and the results in Table 6.4.7A (see Appendix page 352) show that among facilities with a water source, 72 percent also had a water storage tank with an average maximum volume of 16,268 litres, and among these, 70 percent were filled with piped water. Gambella region (43 percent) and Addis Ababa (96 percent) had the lowest and highest percentage of facilities with a water tank. As reported for other findings, proportionally health centres and government facilities reported fewer water tanks for storage than their counterparts.

Functioning water in separate physical spaces where maternal and newborn health services are delivered

Like electricity, the survey also inquired of the availability of water in separate service areas. A high proportion of facilities with operating theatres reported that they had water: 90 percent of general operating theatres and 88 percent of ob/gyn operating theatres (Table 6.4.8A in the Appendix page 354). Facilities with an ICU or NICU showed similar high rates of having water in those service areas. On the other hand, facilities with a room for IMNCI did not share this nearly universal but basic utility of easy access to water (39 percent of all facilities) (Table 6.4.9A in the Appendix page 355).

Availability of toilets

Table 6.4.10A (see Appendix page 356) shows the percentage of facilities with toilets for staff and clients. At national level, 90 percent of investigated health facilities had a functioning toilet for staff and 96 percent had one for clients. In both cases, pit latrines were the most common type of toilet (38 percent for staff and 41 percent for clinets. Among facilities with a toilet, only 14 percent of staff toilets and 9 percent of client toilets were flush or pour flush toilets. Regionally, the availability of toilets for staff ranged between 86 percent in Oromia and 100 percent in several regions, while toilets for clients ranged from 89 percent in Gambella to 100 percent, again in several regions. Health centres reported lower availability of toilets for staff (89 percent) and clients (96 percent) than other facility types; nevertheless, availability was high.

6.5 Availability of modes of communication

Modes of communication

Communication within the health system is critical for many aspects of management and clinical care. It plays an especially important role for referral as it is needed to call for an ambulance and to alert the receiving facility that a client is coming. It facilitates telemedicine and consultations that might obviate the need for referral, all the while improving pre-referral care or care in general. Easy access to modes of communication also makes feedback easier. Good management and administrative duties also require easy access to modes of communication.

Table 6.5.1A in the Appendix page 358 shows the percentage of facilities with a variety of modes of communication. Ideally, facilities would have a direct line to the maternity ward, but only 25 percent of facilities had a functioning landline and only 11 percent a landline in the maternity. Eleven percent of facilities owned their own cell phone. Overall 36 percent of facilities had at least one mode of functioning communication on-site. In addition to facility-owned modes of communication, 92 percent of facilities had staff with personal cell phones, but the extent to which staff use their personal cell phones for work-related

matters was not investigated. Computers were found in 70 percent of facilities but only 7 percent of facilities had access to the internet.

Regionally, facilities in Gambella and Addis Ababa demonstrated two extremes regarding the availability of on-site facility-owned modes of communication: at the low end, only 7 percent of facilities in Gambella had at least one mode of functional communication compared with 97 percent of facilities in Addis Ababa (Figure 6.5.1). Compared to other types of facilities, health centres had poor access to a functional mode of facility-owned communication (31 percent). Compared with public facilities, the private-for-profit and private-not-for-profit facilities had higher levels of ownership of at least one mode of functional communication (34, 95, and 68 percent, respectively). Finally, in keeping with most of the urban-rural results above, rural facilities were at a major disadvantage compared to urban facilities concerning their availability of modes of communication, access to the internet, and computers.

Figure 6.5.1: Percent of facilities with at least 1 mode of functional communication on-site, by region, Ethiopia EmONC, 2016

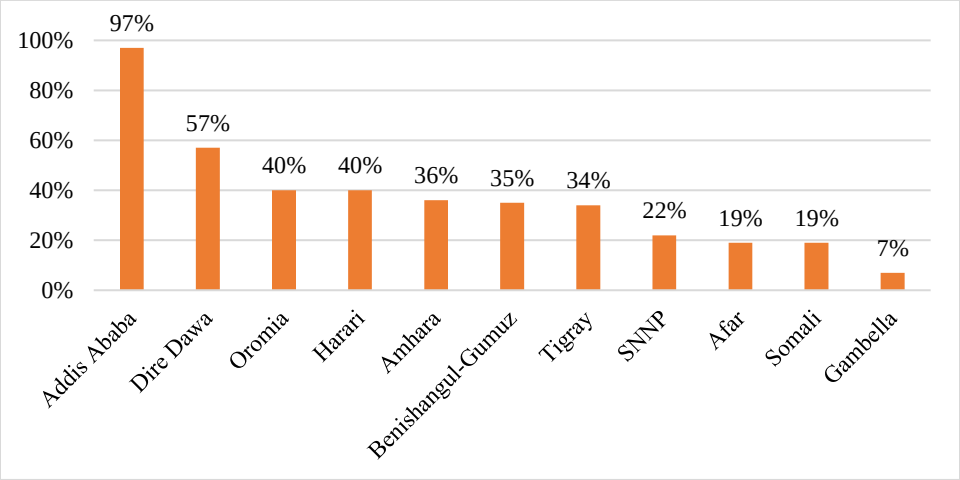


Table 6.5.2 presents the percent distribution of facilities according to strength of cell phone signal, and among facilities with a signal, percent with staff with a cell phone, use of their cell phone for work, and whether the facility had a policy to reimburse costs. Thirty-six percent of facilities had a very dependable cell phone signal, whereas 10 percent of facilities had no cell phone signal. Where there was a signal, 87 percent of facilities with staff who had their own cell phone used their personal phone for work-related calls, but only 8 percent of facilities had a policy to reimburse staff.

Table 6.5.2: Percent distribution of facilities according to strength of cell phone signal at facility, and among facilities with a signal, percent with staff with cell phone, that used their cell phone for work, and that have a policy to reimburse costs, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

		Cell phone signal				Among facilities with cell phone signal, percent where:		
	Number of facilities	Very dependable signal	Somewhat dependable signal	Not very dependable signal	No cell phone signal	Staff have their own cell phone	Staff use their personal phone for work-related calls	Facility has policy to reimburse staff for use of air time for work[1]
National	3,804	36%	35%	20%	10%	94%	87%	8%
Region								
Tigray	255	46%	40%	11%	3%	97%	95%	8%
Afar	77	19%	27%	5%	48%	75%	72%	10%
Amhara	876	36%	37%	20%	7%	95%	83%	3%
Oromia	1,405	36%	34%	19%	12%	92%	86%	9%
Somali	161	53%	14%	6%	27%	98%	86%	14%
B-Gumuz	43	40%	23%	5%	33%	86%	83%	12%
SNNP	773	26%	41%	29%	4%	98%	96%	7%
Gambella	27	30%	37%	4%	30%	100%	95%	6%
Harari	15	73%	13%	0%	13%	54%	38%	0%
Addis Ababa	151	45%	19%	31%	5%	90%	71%	14%
Dire Dawa	21	76%	14%	5%	5%	65%	60%	8%
Facility type								
Referral/specialized hospitals	30	37%	30%	33%	0%	77%	73%	23%
General hospitals	103	44%	27%	22%	7%	85%	77%	16%
Primary hospitals	160	35%	31%	28%	6%	91%	87%	8%
MCH specialty centres	23	39%	30%	22%	9%	86%	67%	29%
Health centres	3,459	35%	35%	19%	10%	95%	88%	7%
MCH specialty clinics	16	25%	50%	25%	0%	88%	69%	18%
Higher clinics	13	46%	8%	38%	8%	75%	67%	12%
Managing authority								
Public/government	3,662	36%	35%	19%	10%	95%	88%	7%
Private-for-profit	83	41%	25%	27%	7%	81%	64%	22%
Private-not-for-profit[2]	59	29%	29%	36%	7%	93%	84%	20%
Location								
Urban	1,497	35%	34%	24%	6%	93%	86%	9%
Rural	2,307	36%	35%	17%	12%	95%	88%	7%

[1] Based on facilities where staff use their own airtime for work calls.

[2] Includes NGO, faith-based, or mission facilities.

6.6 HMIS

Nearly all (97 percent) facilities had an HMIS system and compiled reports on maternal and newborn service data, and of these, 90 percent compiled reports monthly (Table 6.6.1A in the Appendix page 360). Somali region had the lowest percentage of facilities with a data collection system in place (80 percent), with monthly MNH reports (75 percent), and a dedicated person for MNH service data (37 percent). Nationally, only two-thirds of the facilities with such a system had a person dedicated to manage the MNH data, and surprisingly, very little difference was observed across managing authority. However, rural facilities had fewer human resources dedicated to MNH service data than urban facilities.

6.7 Comparisons between 2008 and 2016

Figure 6.7.1 and Table 6.7.1 show comparisons in the availability of infrastructure in labour and delivery and the results were generally positive. Nationally, five items showed improvement while two items did not. The greatest percentage point increase was found in the availability of a means of ventilation: 66 percent in 2008 versus 84 percent in 2016. The largest decline was related to the availability of running water: in 2008, 60 percent of facilities reported to have running water but in 2016 the percentage was 50 percent of facilities. Among hospitals, however, all items showed improvements or remained the same, most of which already enjoyed high levels. Similarly, private facilities also reported improved labour and delivery conditions at greater rates than public facilities.

Figure 6.7.1: Percent of facilities with infrastructure in labour and delivery area in 2008 and 2016, by facility type, Ethiopia EmONC, 2016

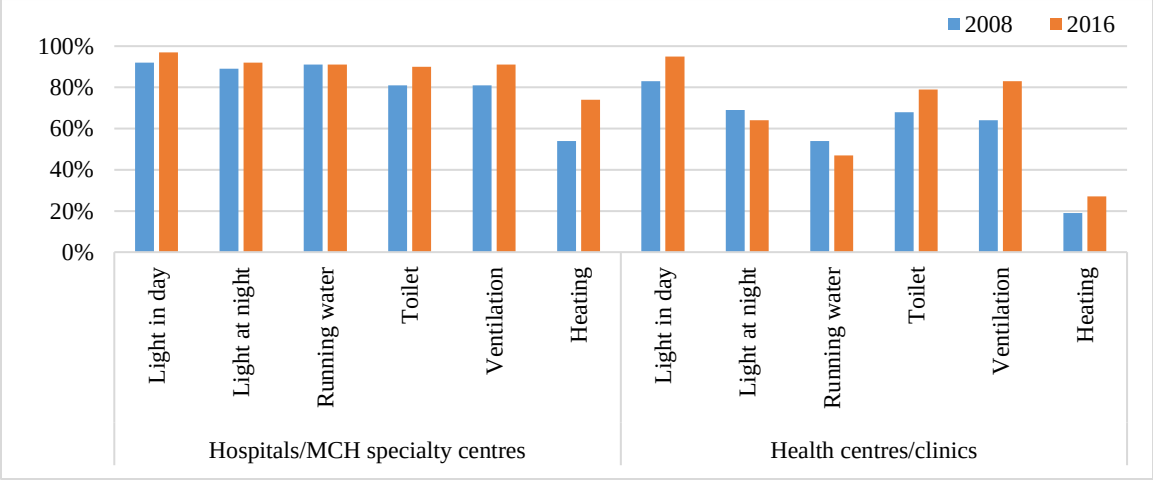


Table 6.7.1: Percent of facilities with selected infrastructure in 2008 and 2016, by facility type and managing authority, Ethiopia EmONC, 2016

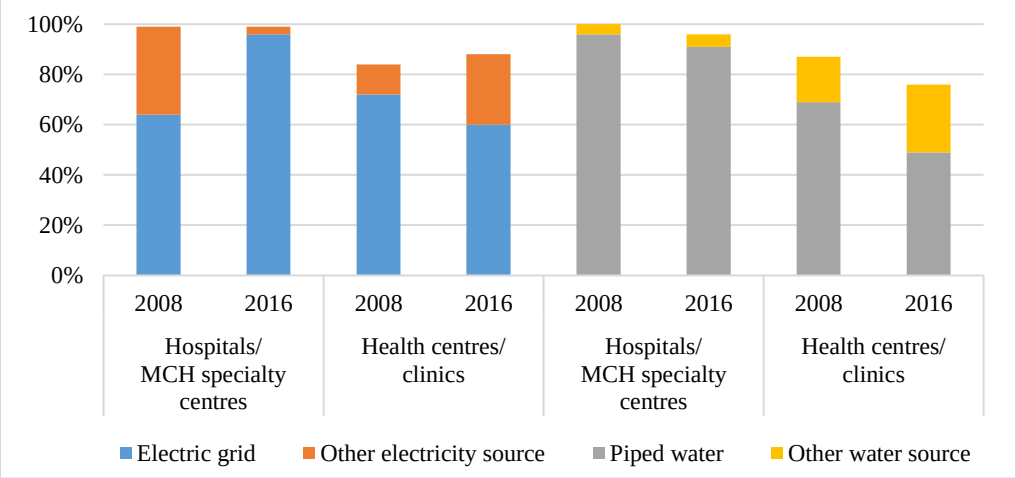
	All facilities		Facility type				Managing authority					
			Hospitals/MCH specialty centres		Health centres/clinics[1]		Public/government		Private-for-profit		Private-not-for-profit[2]	
	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016
Number of facilities	797	3,804	112	316	685	3,488	750	3,662	27	83	20	59
Facility infrastructure												
Electricity of any form	86%	88%	99%	99%	84%	88%	85%	88%	89%	98%	90%	95%
Electricity from the grid	71%	63%	64%	96%	72%	60%	72%	62%	52%	98%	50%	90%
Water from any source	89%	78%	100%	96%	87%	76%	88%	77%	96%	95%	100%	98%
Piped water	73%	53%	96%	91%	69%	49%	72%	51%	96%	95%	70%	88%
Labour and delivery infrastructure												
Sufficient light during the day	84%	95%	92%	97%	83%	95%	85%	95%	63%	99%	85%	97%
Sufficient light at night	72%	67%	89%	92%	69%	64%	72%	65%	63%	98%	80%	92%
Running water	60%	50%	91%	91%	54%	47%	59%	49%	63%	94%	85%	92%
Functioning toilet for client use	70%	80%	81%	90%	68%	79%	70%	79%	63%	96%	85%	95%
Means of ventilation	66%	84%	81%	91%	64%	83%	66%	84%	63%	95%	75%	85%
Means of heating	24%	31%	54%	74%	19%	27%	21%	29%	59%	80%	60%	66%
Waiting area for visitors and family	69%	79%	79%	90%	68%	78%	69%	79%	63%	94%	70%	95%
At least 1 mode of communication on-site	63%	36%	93%	86%	58%	31%	62%	34%	85%	95%	60%	68%
Ratio of all ob/gyn, labour, and delivery beds/couches to 1,000 institutional deliveries	32	19	28	26	38	17	33	18	41	60	18	27

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Figure 6.7.2 highlights changes in the availability of electricity and water. The most substantial improvements in electricity were found among hospitals. Although 99 percent of hospitals had some source of electricity at both points in time, what changed was the increased proportion of hospitals with power from the grid. The pattern was different for health centres and clinics, where the percentage of facilities with power from the grid decreased.

Figure 6.7.2: Percent of facilities with any source of electricity (and percent from grid) and percent of facilities with any source of water (and percent from piped water) in 2008 and 2016, by facility type, Ethiopia EmONC, 2016



No improvements in the availability of any source of water or in piped water was observed for hospitals or health centres and clinics (Figure 6.7.2). The lack of improvements may be explained in part by the rapid expansion in the number of facilities.

The percentage of facilities with at least one mode of communication owned by the facility decreased substantially since 2008, from 63 percent to 36 percent. This decrease was seen across both large groupings of facilities and primarily in government facilities; increases in at least one mode of communication were observed among private facilities (Table 6.7.1). It may be possible that personal cell phones have become the primary mode of communication; if correct, this puts a burden on staff.

Finally, the average number of maternity beds per facility decreased across all types of facilities and among public facilities, however, the mean number of maternity beds in private facilities increased.

Chapter 7: Availability of Human Resources

One of the strategic objectives of HSDP IV is to ensure the availability of the right mix of adequately skilled and motivated staff who are committed to work and stay in a well-managed sector. Priority strategic objectives of HSDP IV include improving the availability of key human resource (HR) categories at all levels by scaling-up the training of professionals who are in scarce supply such as medical doctors, emergency surgical officers (ESOs), and midwives, and by improving the motivation and retention of HR through the implementation of evidence-based financial and non-financial incentives.

Key findings

- In health centres/clinics a gap exists between the number of established positions and the actual number of employees for every health worker cadre. In some cases, re-posting of cadres from one level of health facility to another may be an effective strategy that is immediately implementable.
- There is a lack of understanding about the fundamental difference between the FMHACA minimum standards and the HSDP IV targets.
- Most obstetric services and procedures were found to be highly dependent on obstetricians/ gynaecologists, ESOs and midwives. The coverage of these services was largely influenced by the availability of these cadres across health facilities. For example, ob/gyns, while important providers of emergency care, were much less available across facilities than were midwives. This means that in most cases, women were dependent upon the midwife for services.
- The HSDP target for midwives and the 6-midwives-to-1000-population ratio have been met, yet 4,803 unfilled established positions for midwives remain.
- Few midwives working in health centres/clinics have received BEmONC training.
- ESOs played key roles in the provision of basic and comprehensive emergency obstetric services, especially in hospitals.
- Fewer than 5 percent of medical doctors and health officers have received CEmONC training. Gaps remain in the percent of ob/gyns and ESOs who have been trained in CEmONC.

7.1 Training targets and staffing patterns

Figures 7.1.1 and 7.1.2, and Table 7.1.1A (see the Appendix page 362) show the minimum national standards for human resources recommended by FMHACA[39] and the HSDP IV 2015 targets compared to the current availability of midwives, nurses, health officers, GPs, ESOs and obstetrician/gynaecologists. FMHACA standards indicate the minimum number of each health worker cadre required in each type of public/government health facility. To calculate the national minimum required, we multiplied the number of each cadre required in the facility type by the number of those facilities included in the survey. Separate from these FMHACA minimum standards, HSDP IV set ambitious targets for the number of each health worker cadre required to meet the needs of the population. The Midwifery Initiative Program estimates

[39] Food, Medicine and Healthcare Administration and Control Authority, Ethiopian Standard Agency, 2012.

that by 2020, 22,599 midwives will be required to meet the demands of deliveries in the country, though the calculation appears to assume an institutional delivery rate of 100 percent by that date[40].

Figure 7.1.1: FMHACA minimum human resource (HR) standards, HSDP-IV HR targets, and current availability of HR in facilities for midwives, nurses, health officers, and GPs, Ethiopia EmONC, 2016

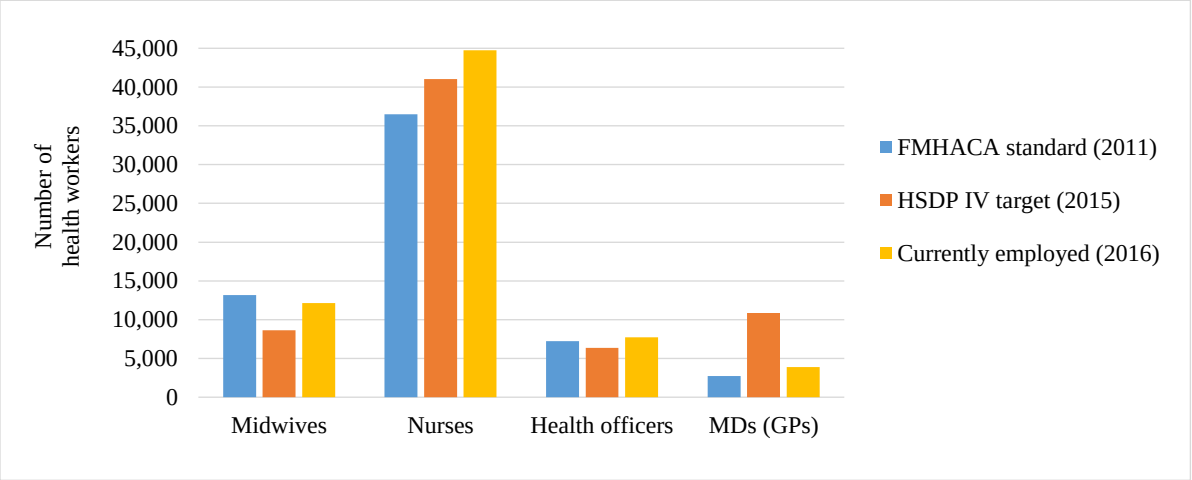
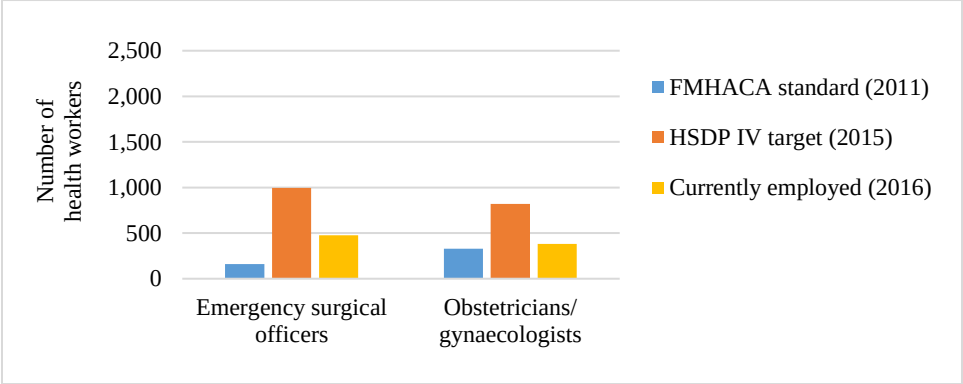


Figure 7.1.2: FMHACA minimum human resource (HR) standards, HSDP-IV HR targets, and current availability of HR in facilities for emergency surgical officers and obstetricians/gynaecologists, Ethiopia EmONC, 2016



For nurses and health officers, FMHACA minimum standards have been met as have the HSDP IV targets (Figure 7.1.1). Midwives and health officers are an anomaly because the minimum standard set by FMHACA exceeds the HSDP IV target. Nationally, the number of midwives currently employed exceeds the HSDP IV target but does not quite reach the standard set by FMHACA (12,153 currently employed vs. 13,161 recommended by FMHACA standard). Health officers exceed both the FMHACA standards and

[40] Federal Ministry of Health, UNFPA. National Road Map for Midwifery Education and Service Provision 2016-2025: Midwifery Initiative Program.Addis Ababa, Ethiopia. 2015.

HSDP IV targets. The number of medical doctors, ESOs and ob/gyns fall substantially short of the HSDP IV targets; yet, exceed the FMHACA minimum standards.

Table 7.1.1A (page 362 in the Appendix) provides more detail on the gaps (or surplus) for each cadre, by health facility type. For example, while the overall number of nurses appeared to be sufficient (as compared to the FMHACA standards), the story was different by facility type: general hospitals experienced a deficit of 3,903 nurses, yet health centres appeared to have 10,112 more than required by the minimum standard. Overall, primary hospitals were the best staffed and general hospitals the most understaffed across all health worker cadres. Referral/specialized hospitals were well-staffed overall but lacked some specialists (neonatologists, anaesthesiologists and nurse anaesthetists). On the other hand, health centres had deficits of midwives, HOs, laboratory and pharmacy staff.

Table 7.1.2 compares the number of established positions (as reported by each facility's administrative staff) to the number currently employed, and shows staff turnover in the last 12 months. In hospitals and MCH specialty centres, compared to the number of established positions reported by facility staff, there were shortages of ob/gyns, general surgeons, paediatricians, neonatologists, midwives, anaesthesiologists, nurse anaesthetists, and laboratory technicians. The greatest shortfall was among laboratory technicians (398), followed by nurse anaesthetists (276) and midwives (103). However, there was a net gain over the year in new staff postings among all cadres in higher facilities, except neonatologists. For example, there was a net gain of 330 midwives which, when compared against the current gap of 103 midwives, indicates that if the rate of posting holds, the gap in midwives in hospitals/MCH specialty centres should be closed within a year. In health centres, MCH specialty and higher clinics, gaps measured against the established positions existed for all health cadres, with the largest gap among nurses (11,813), followed by midwives (4,700), laboratory technicians (4,062), and health officers (3,924). Over the last 12 months, there was a net loss of 352 nurses and 324 laboratory technicians in these facilities, indicating that the gap in these cadres is likely growing rather than shrinking. On the other hand, there was a net gain of 133 midwives and 98 health officers, indicating movement in the right direction for these cadres, though the magnitude of the gain was small relative to the existing gap. Net gains in ob/gyns, paediatricians, and neonatologists in these facilities were large enough that if the rate of posting holds, gaps should be closed within a year.

Table 7.1.2: Number of health worker established positions, currently employed, and staff turnover (left, posted/hired) in the last 12 months, by health worker cadre and facility type, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres n=316						Health centres/clinics[1] n=3,488					
				In the last 12 months:						In the last 12 months:		
	Established positions[2]	Currently employed	Surplus (gap)	Staff left	Staff posted/ hired	Net gain (loss)	Established positions[2]	Currently employed	Surplus (gap)	Staff left	Staff posted/ hired	Net gain (loss)
Health worker cadre												
MD (general practitioner)	3,269	3,826	557	361	723	362	205	77	(128)	15	34	19
Obstetrician/gynaecologist	404	345	(59)	33	56	23	39	37	(2)	1	15	14
General surgeon	398	345	(53)	29	35	6	6	2	(4)	9	1	(8)
Paediatrician	280	239	(41)	17	20	3	20	7	(13)	0	20	20
Neonatologist	56	17	(39)	5	2	(3)	11	0	(11)	9	90	81
Emergency surgical officer	393	448	55	55	119	64	68	28	(40)	5	8	3
Midwife	3,357	3,254	(103)	257	587	330	13,599	8,899	(4,700)	1,506	1,639	133
Nurse	16,640	17,232	592	1,053	1,967	914	39,321	27,508	(11,813)	3,558	3,206	(352)
Health officer	689	933	244	101	104	3	10,703	6,779	(3,924)	1,205	1,303	98
Anaesthesiologist (MD)	92	37	(55)	5	6	1	0	0	0	9	11	2
Nurse anaesthetist	1,228	952	(276)	97	151	54	1,082	37	(1,045)	24	12	(12)
Laboratory technician	3,098	2,700	(398)	224	331	107	9,061	4,999	(4,062)	908	584	(324)

[1] Includes MCH specialty clinics and higher clinics.

[2] As reported by administrative staff at each facility.

7.2 Extended leave, provision of care, and basic and comprehensive EmONC training

Nine percent of medical doctors in hospitals and MCH specialty centres, and 21 percent of laboratory technicians in health centres/MCH specialty/higher clinics were on extended leave for more than one month (Table 7.2.1). In hospitals and MCH specialty centres, 93 percent of obstetrician/gynaecologists and 83 percent of ESOs and midwives were providing obstetric and newborn care. Similarly, in health centres/ MCH specialty or higher clinics, 100 percent of obstetrician/gynaecologists and paediatricians and 82 percent of ESOs were providing obstetric and newborn services, although the numbers of these cadres were relatively small.

To reduce maternal and newborn mortality and morbidity, a facility should have all the necessary supplies and medical equipment, and health care workers should have the essential competencies (knowledge, attitude and skills). As shown in Table 7.2.1, among 345 ob/gyns employed in hospitals and MCH specialty centres, 55 percent (189) received comprehensive EmONC training. Just 7 percent (227) of the 3,254 midwives had comprehensive EmONC training, and 38 percent of the 448 ESOs (170) were trained in CEmONC. However, midwives were much more likely to have received BEmONC training (43 percent) than CEmONC training (7 percent). In hospitals/MCH specialty centres, fewer than 6 percent of medical doctors, health officers and nurses had basic or comprehensive EmONC training.

In health centres and clinics, only 15 percent of midwives and 2 percent of nurses received BEmONC training and none reported receiving CEmONC training. Similarly, only 5 percent of health officers received BEmONC training and one percent CEmONC training. Nearly three-fourths of ob/gyns had

received basic and comprehensive EmONC training, however, it is important to bear in mind that only 1 percent of health centres and clinics actually had an ob/gyn on staff (see Section 7.3).

Figure 7.2.1 illustrates the proportion of all ob/gyns, ESOs and midwives who have received EmONC training (BEmONC and CEmONC, separately) in hospitals and MCH specialty centres. These findings indicate the need for continued and expanded training on basic and comprehensive EmONC to increase the proportion of providers with the skills required to reduce maternal and newborn mortality and morbidity.

Figure 7.2.1: Percent of health workers in hospitals/MCH specialty centres with basic and comprehensive EmONC training, by health worker cadre, Ethiopia EmONC, 2016

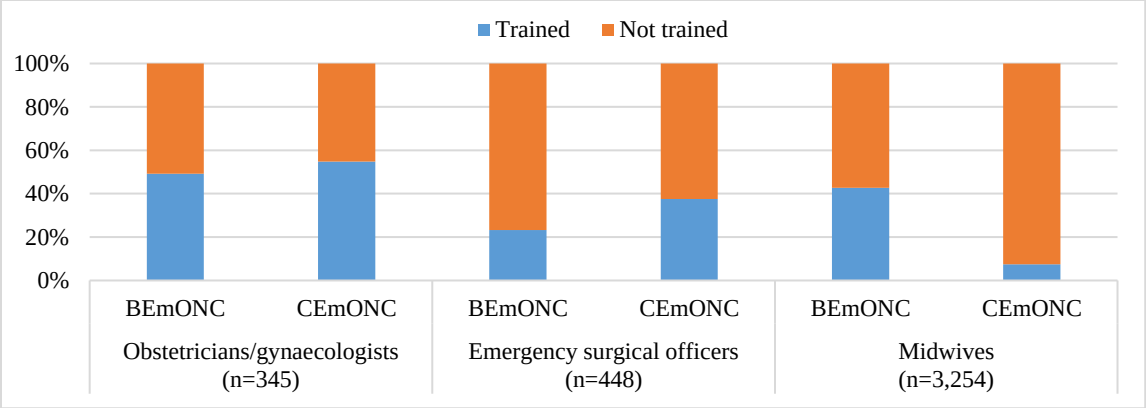


Table 7.2.1: Percent of health workers on extended leave, providing delivery services, and trained in EmONC, by health worker cadre and facility type, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres n=316							Health centres/clinics[1] n=3,488						
	Number of health workers currently employed	On extended leave	Providing obstetric/ newborn care	Trained in BEmONC	Trained in CEmONC	Trained for NICU	Trained in essential newborn care/HBB	Number of health workers currently employed	On extended leave	Providing obstetric/ newborn care	Trained in BEmONC	Trained in CEmONC	Trained for NICU	Trained in essential newborn care/HBB
Health worker cadre														
MD (general practitioner)	3,826	9%	25%	5%	5%	6%	13%	77	4%	56%	10%	1%	6%	9%
Obstetrician/gynaecologist	345	2%	93%	49%	55%	35%	42%	37	5%	100%	73%	73%	51%	59%
General surgeon	345	6%	29%	14%	17%	14%	15%	2	0%	0%	0%	0%	0%	0%
Paediatrician	239	2%	56%	14%	13%	27%	30%	7	0%	100%	14%	14%	43%	29%
Neonatologist	17	0%	47%	12%	12%	18%	18%	0						
Emergency surgical officer	448	2%	83%	23%	38%	15%	27%	28	4%	82%	25%	54%	18%	43%
Midwife	3,254	5%	83%	43%	7%	11%	34%	8,899	2%	25%	15%	0%	1%	10%
Nurse	17,232	3%	15%	2%	1%	3%	4%	27,508	2%	27%	2%	0%	0%	4%
Health officer	933	4%	20%	5%	3%	2%	5%	6,779	4%	66%	5%	1%	1%	9%
Anaesthesiologist (MD)	37	3%	27%	11%	11%	11%	11%	0						
Nurse anaesthetist	952	1%	14%	1%	0%	0%	2%	37	3%	11%	0%	0%	0%	0%
Laboratory technician	2,700	3%	5%	0%	0%	0%	0%	4,999	21%	3%	0%	0%	2%	0%

HBB = Helping Babies Breathe; NICU = neonatal intensive care unit.

[1] Includes MCH specialty clinics and higher clinics.

Table 7.2.1 also shows that ob/gyns and paediatricians were the most likely cadres to be trained in NICU skills, both in hospitals/MCH specialty centres and in health centres/clinics. Meanwhile, no more than 18 percent of any other cadre was trained for the NICU in either level of facilities. It is important to keep in mind that high level results such as these can mask some important progress. For example, this assessment found that 651 nurses currently providing maternity services had received NICU training. This aligns quite nicely with other estimates of the number of NICU-trained nurses: a recent assessment in 121 hospitals with NICUs indicated that of the 895 nurses working in NICUs, 617 (69%) were NICU-trained. Of the 651 NICU-trained nurses found in this EmONC assessment, 30 percent were working in facilities without a NICU, perhaps not an ideal posting given their specialized skills.

A high proportion of ob/gyns received training on essential newborn care/Helping Babies Breathe (HBB): 42 percent in hospitals/MCH specialty centres and 59 percent in health centres/clinics. This was followed by midwives in hospitals/MCH specialty centres (34 percent) and ESOs in health centres/clinics (43 percent) (Table 7.2.1). Figure 7.2.2 presents these findings for selected health works cadres, and indicates a need for extended training in essential newborn care/HBB, particularly in health centres/clinics where just 10 percent of all midwives reported receiving training.

Figure 7.2.2: Percent of health workers trained in essential newborn care/Helping Babies Breathe, by health worker cadre and facility type, Ethiopia EmONC, 2016

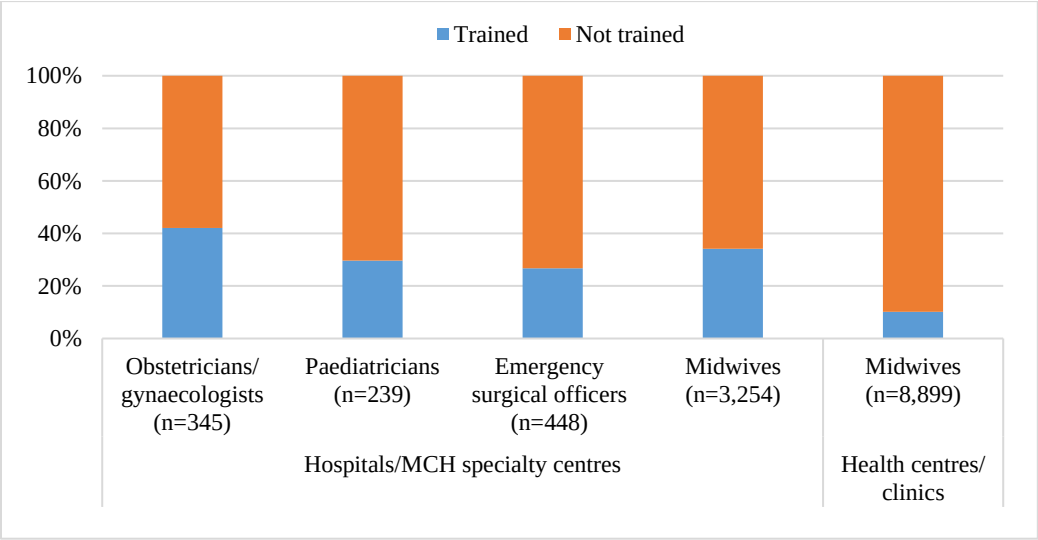


Table 7.2.2A (see page 363 in the Appendix) shows the same information as Table 7.2.1 but disaggregated by managing authority. Almost all obstetrician/gynaecologists in private-for-profit facilities were providing obstetric and newborn care services, as were 96 percent in private-not-for-profit, and 89 percent in public/government facilities. ESOs were the next most likely to be providing obstetric and newborn services in all managing authorities, followed by health officers in public/government and private-not-for-profit facilities and paediatricians in private-for-profit facilities. Meanwhile, just over half of midwives in private-for-profit facilities, and around 40 percent in public/government and private-not-for-profit facilities provided these services.

Sixty-nine percent of ob/gyns in private-not-for-profit facilities, 58 percent in private-for-profit facilities, and 54 percent in public/government facilities had CEmONC training. Sixty-nine, 53 and 48 percent of obstetrician/gynaecologists from private-not-for-profit, private-for profit, and public/government facilities had BEmONC training, respectively, followed by midwives. Regarding NICU and essential newborn care/HBB training, obstetrician/gynaecologists and paediatricians across all managing authorities (as well as ESOs in private-for-profit facilities only) were highly trained compared with the rest of health workers.

7.3 Availability of health workers 24/7

Labour, delivery and obstetric emergencies can occur at inconvenient hours of the day and night, requiring facilities to be open 24 hours a day and 7 days a week; equipped with competent staff and functional medical equipment; and well-supplied with medications and other medical commodities.

As per the existing Ethiopian health tier system, women are referred upward through the health system as more specialized treatment is required. Additionally, geographic coverage of life-saving services and emergency referral is a critical component to universal access to quality care[41].

Key health workers whose presence is critical to the management of obstetric and newborn emergencies are medical doctors, obstetrician/gynaecologists, emergency surgical officers, midwives, anaesthetists, and neonatologists.

Table 7.3.1 presents percentages of hospitals and health centres with health workers present and on call at certain times, by health worker cadre. The first column of Table 7.3.1 indicates the percent of health facilities with at least one of the indicated cadre on staff. Virtually all hospitals/MCH specialty centres had at least one nurse, laboratory technician or a midwife on staff. Most had at least one anaesthesiologist/ anaesthetist (88 percent) and medical doctor (85 percent). Slightly more than 40 percent of hospitals and MCH specialty centres had at least one ob/gyn or a general surgeon. All health centres and clinics had at least one nurse, 97 percent had at least one midwife, 87 percent a health officer, and 76 percent a laboratory technician. Other health worker cadres were very rarely present at health centres/clinics.

From Monday to Friday, almost all hospitals and MCH specialty centres had midwives, nurses, ESOs and laboratory technicians on-site. Many had an MD and an anaesthesiologist (80 and 84 percent, respectively). But, the presence of obstetrician/gynaecologists, general surgeons and paediatricians/neonatologists on-site during weekdays was much lower, at 40, 37 and 25 percent, respectively. Almost all health centres and clinics had midwives and nurses, and the vast majority had HOs and laboratory technicians, on-site during weekdays.

At times other than Monday through Friday during the day, midwives and nurses were typically available at all health facilities (hospitals/MCH specialty centres and health centres/clinics). During these times, most hospitals/MCH specialty centres had additional staff on-site, most often in the form of a laboratory

[41] Federal Ministry of Health. Health Sector Development Plan IV. Addis Ababa, Ethiopia. 2010.

technician (90 percent or more) and a general practitioner (72 percent or more), along with anaesthesia staff (67 percent or more). Just under half of these facilities had an ESO and HO on-site during these times.

Table 7.3.1: Percent of facilities with at least one health worker in selected cadres on staff, and staff coverage during a normal week (on-site and on-call) at certain times, by health worker cadre and facility type, Ethiopia EmONC, 2016

	Facilities with at least one of the cadre on staff	Staff coverage during a normal week, at certain times							
		Monday-Friday daytime		Monday-Friday night		Saturday-Sunday & holidays daytime		Saturday-Sunday & holidays night	
		On-site	On-call	On-site	On-call	On-site	On-call	On-site	On-call
Hospitals/MCH specialty centres									
MD (general practitioner)	85%	80%	10%	72%	17%	77%	14%	73%	16%
Obstetrician/gynaecologist	43%	40%	19%	20%	33%	22%	32%	22%	31%
General surgeon	42%	37%	17%	23%	28%	19%	27%	17%	29%
Paediatrician/neonatologist	28%	25%	11%	14%	16%	16%	18%	17%	17%
Emergency surgical officer	65%	96%	16%	46%	30%	47%	28%	46%	30%
Midwife	98%	98%	9%	95%	6%	95%	7%	93%	8%
Nurse	99%	97%	8%	91%	6%	93%	7%	90%	8%
Health officer	64%	59%	3%	46%	2%	49%	3%	48%	3%
Anaesthesiologist (MD)/nurse anaesthetist	88%	84%	15%	67%	19%	72%	20%	68%	21%
Laboratory technician	99%	97%	8%	91%	7%	91%	7%	90%	8%
Health centres/clinics[1]									
MD (general practitioner)	1%	1%	1%	1%	1%	1%	1%	1%	1%
Obstetrician/gynaecologist	1%	1%	0%	0%	0%	1%	0%	0%	1%
General surgeon	0%	0%	0%	0%	0%	0%	0%	0%	0%
Paediatrician/neonatologist	0%	0%	0%	0%	0%	0%	0%	0%	0%
Emergency surgical officer	1%	0%	1%	0%	1%	0%	1%	0%	1%
Midwife	97%	96%	5%	94%	7%	94%	6%	93%	7%
Nurse	100%	98%	9%	96%	15%	97%	13%	96%	14%
Health officer	87%	85%	21%	35%	60%	47%	49%	37%	58%
Anaesthesiologist (MD)/nurse anaesthetist	1%	1%	0%	1%	0%	1%	0%	1%	0%
Laboratory technician	76%	75%	12%	36%	36%	43%	34%	36%	36%

[1] Includes MCH specialty clinics and higher clinics.

Meanwhile, in health centres/clinics, midwives and nurses were often the only staff on-site during the evening or weekends/holidays; fewer than half of these facilities had an HO or a laboratory technician on-site during these times. About 60 percent of health centres/clinics had an HO on-call in the evenings (including weekend nights), and about half had an HO on-call during the daytime on weekends and holidays.

Across all health worker cadres and facility types, staff were more likely to be on-site during the day Monday through Friday than at night or during the weekend. The difference was greatest among ESOs in

hospitals/MCH specialty centres and health officers in health centres/clinics, where 96 percent and 85 percent (respectively) of facilities had one of these health workers on-site weekdays, but only 46 percent and 37 percent of facilities, respectively, did on weekend nights. For the most part, as on-site staffing decreased, on-call staffing increased; however, the increase in on-call staffing rarely matched the decrease in on-site staffing. This means that across all facility levels and nearly all health worker cadres, facilities had fewer health workers (both on-site and on-call) available to respond to obstetric emergencies at night or on weekends than on weekdays.

7.4 Regulatory policies and practice on front line

Basic and comprehensive EmONC signal functions

Table 7.4.1A (see page 364 in the Appendix) shows the role of different health cadres in performing basic and comprehensive EmONC signal functions according to existing regulatory policies. The purpose of this table is to give insight into the expected role of health cadres in the management of obstetric and newborn complications, and compare that with their actual performance. 'Y' means that policy clearly supports the cadre to provide the specific EmONC signal function, and 'N' indicates that the policy does not support the cadre to perform that specific signal function. An empty grey cell indicates that these functions are performed by the health cadres but the policy is not clear[42].

Figure 7.4.1 illustrates what proportion of facilities had at least one health worker on staff of any cadre who could perform the EmONC signal function (as reported by each facility's administrative staff rather than being based on regulatory policies). Hospitals and MCH specialty centres were well-staffed to perform life-saving EmONC signal functions. Blood transfusion for the mother was the signal function with the lowest human resource (HR) availability (79 percent of hospitals), followed by caesarean delivery and E&C or D&C (both 83 percent). Almost all health centres had HR coverage to provide parenteral antibiotics and uterotonics and manual removal of placenta, and slightly fewer health centres had staff to provide parenteral anticonvulsants (87 percent). However, HR availability in health centres for postabortion care and assisted vaginal delivery was quite low: ranging from 53 percent of health centres for MVA or vacuum extraction, to 38 percent for medical abortion, and only 11 percent for postabortion procedures in later gestations (E&C or D&C).

[42]Federal Ministry of Health of Ethiopia, UNICEF, UNFPA, WHO, AMDD. National Baseline Assessment for Emergency Obstetric & Newborn Care Ethiopia 2008. Addis Ababa, Ethiopia: 2009.

Figure 7.4.1: Percent of facilities with at least one health worker on staff who could perform each of the EmONC signal functions, Ethiopia EmONC, 2016

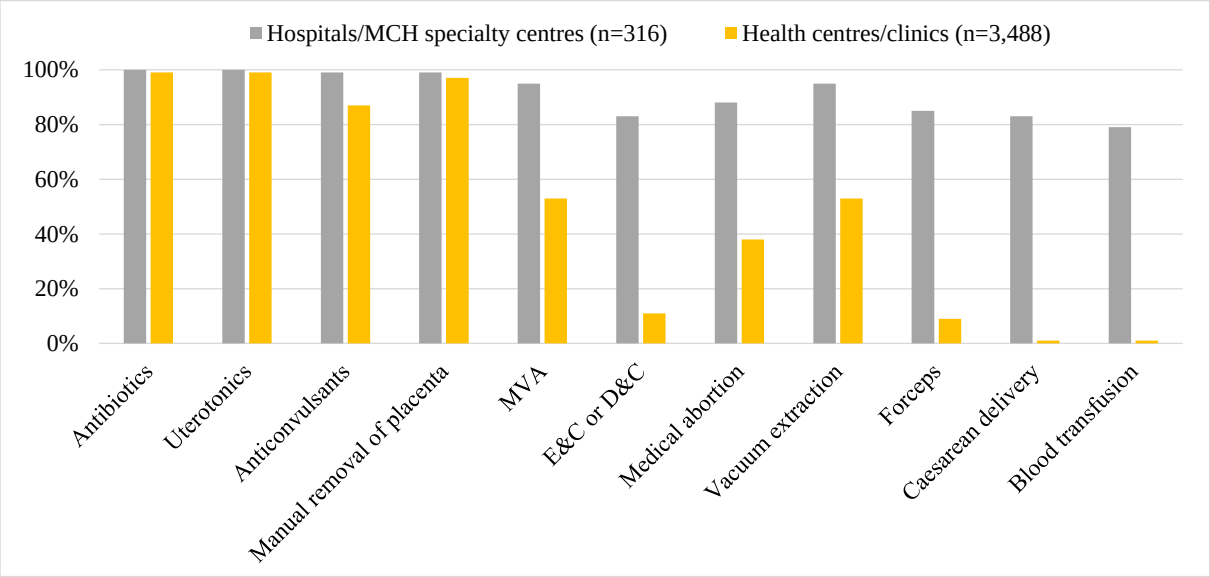


Table 7.4.2 shows the percentage of health facilities where each EmONC signal function was provided by the indicated professional category, among facilities with that cadre on staff. These results reflect the actual administration of medications or performance of procedures, and may conflict with expectations as per policy (Table 7.4.1A page 364 in the Appendix). For example, there is no clear policy that supports medical doctors or health officers to perform caesarean deliveries, but the assessment indicated that in hospitals and MCH specialty centres with MDs and HOs on staff, 14 and 2 percent, respectively, of those facilities reported that these staff performed caesarean deliveries. Similarly, in hospitals/MCH specialty centres with a midwife or nurse on staff, 5 percent and 2 percent, respectively, of those facilities reported that these cadres performed caesarean deliveries, despite the lack of a supportive policy.

To accurately interpret Table 7.4.2, the reader must keep in mind the number of facilities with at least one cadre on staff. The columns that indicate the percent of facilities where the cadre provided each service was based on facilities with that cadre on staff (not out of all facilities). Without this in mind, it is quite easy to come to an erroneous interpretation. For example, the percentage of hospitals and MCH specialty centres where parenteral antibiotics were provided by an ob/gyn was 79 percent (based on facilities with an ob/gyn). In contrast, the percentage of hospitals and MCH specialty centres where MDs provided antibiotics was lower, at 61 percent (based on facilities with an MD). However, the absolute number of hospitals/MCH specialty centres where an MD provided antibiotics was higher than the number where ob/gyns provided antibiotics: 164 hospitals vs. 106 hospitals.

Table 7.4.2: Percent and number of facilities with at least one health worker in selected cadres on staff, and among those, percent of facilities where that cadre provides the EmONC signal functions, by health worker cadre and facility type, Ethiopia EmONC, 2016

	Facilities with at least one of the cadre on staff		Among facilities with at least one of the cadre on staff, the percent where that cadre provides:										
							Removal of retained products			Assisted vaginal delivery			
	%	number	Parenteral antibiotics	Parenteral uterotonics	Parenteral anti-convulsants	Manual removal of placenta	MVA	E&C or D&C	Medical abortion	Vacuum extraction	Forceps	Caesarean delivery	Blood transfusion
Hospitals/MCH specialty centres	n=316												
Health worker cadre													
MD (general practitioner)	85%	270	61%	53%	55%	46%	44%	31%	36%	38%	30%	14%	37%
Obstetrician/gynaecologist	43%	135	79%	79%	80%	93%	93%	91%	81%	95%	94%	98%	76%
Paediatrician/neonatologist	28%	90	47%	17%	76%	4%	4%	3%	3%	3%	3%	3%	14%
Emergency surgical officer	65%	206	85%	88%	85%	90%	90%	78%	78%	88%	82%	83%	66%
Midwife	98%	309	94%	96%	93%	92%	70%	26%	60%	72%	24%	5%	58%
Nurse	99%	313	71%	54%	55%	30%	19%	9%	19%	17%	7%	2%	40%
Health officer	64%	201	57%	48%	45%	39%	30%	11%	26%	22%	10%	2%	25%
Anaesthesiologist (MD)/ nurse anaesthetist	88%	279	28%	29%	29%	3%	2%	1%	1%	2%	1%	5%	23%
Health centres/clinics[1]	n=3,488												
Health worker cadre													
MD (general practitioner)	1%	49	61%	53%	53%	49%	39%	14%	24%	35%	12%	4%	10%
Obstetrician/gynaecologist	1%	26	73%	77%	65%	100%	96%	69%	69%	81%	77%	42%	50%
Paediatrician/neonatologist	0%	7	57%	14%	67%	14%	14%	0%	14%	14%	0%	0%	0%
Emergency surgical officer	1%	22	77%	77%	73%	73%	73%	50%	59%	73%	32%	23%	18%
Midwife	97%	3,371	97%	99%	83%	96%	48%	8%	32%	50%	6%	0%	1%
Nurse	100%	3,478	90%	86%	64%	69%	27%	5%	22%	25%	4%	0%	1%
Health officer	87%	3,045	92%	90%	78%	85%	41%	8%	27%	42%	7%	1%	1%
Anaesthesiologist (MD)/ nurse anaesthetist	1%	25	42%	38%	42%	8%	4%	4%	0%	4%	0%	0%	17%

D&C = dilation and curettage; E&C = evacuation and curettage; MVA = manual vacuum aspiration.

[1] Includes MCH specialty clinics and higher clinics.

Eightly-five percent or more of hospitals and MCH/specialty centres were staffed with MDs, midwives, nurses, and anaesthesia specialists. Midwives provided parenteral administration of uterotonics, antibiotics, and anticonvulsants, as well as manual removal of placenta in more than 90 percent of the hospitals and MCH specialty centres where they were posted. Likewise, ESOs were important providers of EmONC signal functions in hospitals; with presence in 65 percent of hospitals, they provided all the EmONC signal functions in more than two-thirds of the hospitals (where they were posted). Despite the limited number of obstetrician/gynaecologists (43 percent of all hospitals had at least one ob/gyn), in hospitals where they work they often were important providers of the life-saving signal functions for EmONC. Ob/gyns provided assisted vaginal deliveries (vacuum extraction or forceps deliveries) and caesarean delivery in almost all hospitals and MCH specialty centres where they are posted.

The team of staff most typically found in health centres/clinics included at least one nurse, midwife, and health officer. In health centres and clinics, most life-saving EmONC signal functions were provided by midwives and health officers. These two cadres provided parenteral administration of uterotonics, antibiotics and anticonvulsants, along with manual removal of placenta in the vast majority of health centres, while less frequently providing postabortion care or assisted vaginal delivery (50 percent or less of the facilities where they worked). Nurses also commonly provided parenteral uterotonics and antibiotics in health centres/clinics, although their provision of parenteral anticonvulsants was somewhat less common (64 percent). In the very small percentage of health centres/clinics with ob/gyns or ESOs, those cadres provided the basic EmONC signal functions in 32 to 77 percent of facilities (except for manual removal of placenta and MVA by ob/gyns, which were higher).

EmNeC signal functions

Hospitals/MCH specialty centres were well staffed to provide all the EmNeC signal functions (Figure 7.4.2). The provision of antenatal corticosteroids was the EmNeC signal function with the poorest staffing, yet there was staff to provide this signal function in 87 percent of hospitals/MCH specialty centres. There were staffing gaps, however, among health centres/clinics. More than 80 percent of these lower health facilities had someone available to provide newborn resuscitation, antibiotics for pPROM and neonatal sepsis, and KMC. Yet, staff for the remaining three signal functions (antenatal corticosteroids, oxygen and IV fluids for the newborn) were available in one-third or fewer health centres/clinics.

Figure 7.4.2: Percent of facilities with at least one health worker on staff who could perform each of the EmNeC signal functions, Ethiopia EmONC, 2016

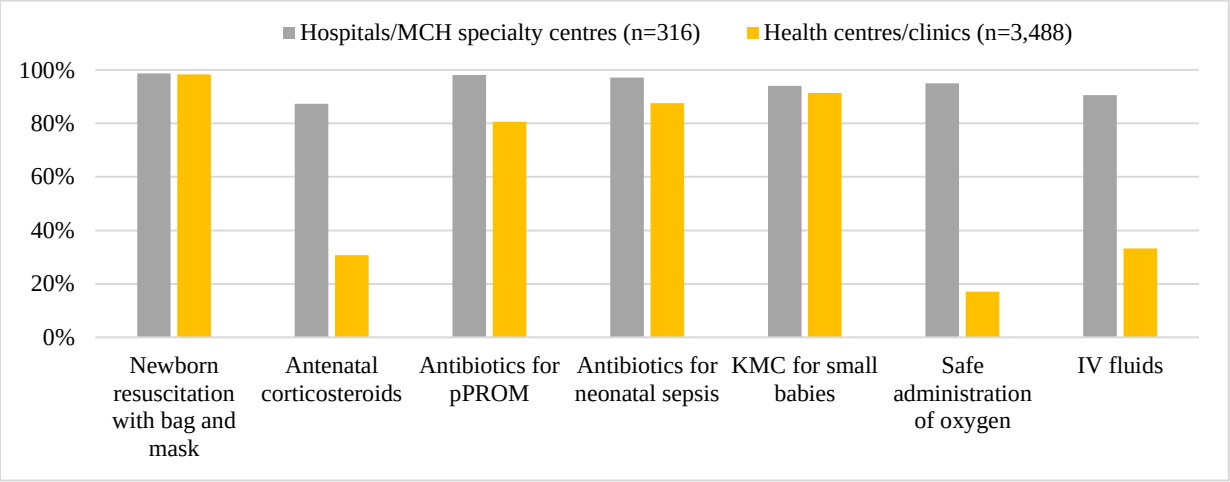


Table 7.4.3 shows the percentage of health facilities where each EmNeC signal function was provided by the indicated professional category, among facilities with that cadre on staff. This table was organized like Table 7.4.2, and the caveat about accurate interpretation is relevant for this table as well. Midwives were an important provider of these critical newborn interventions. They provided newborn resuscitation, antibiotics (for pPROM and newborn sepsis), KMC, and oxygen administration to the newborn in 80 percent or more of hospitals where they were posted. They were less likely to provide antenatal corticosteroids and IV fluids than other EmNeC signal functions, but were still important providers of these interventions in hospitals, as were ob/gyns, though ob/gyns were posted only to 43 percent (135) of hospitals whereas midwives worked in 98 percent of these facilities.

In health centres/clinics, midwives again were the primary providers of these life-saving interventions. They were less likely than their counterparts in hospitals to provide antenatal corticosteroids, IV fluids or oxygen, perhaps because these services were unlikely to be provided at this level, or the equipment/supplies were not available. Health officers and nurses were also important providers of newborn resuscitation, antibiotics (for pPROM and newborn sepsis), and KMC in health centres/clinics.

Table 7.4.3: Percent and number of facilities with at least one health worker in selected cadres on staff, and among those, percent of facilities where that cadre provides the EmNeC signal functions, by health worker cadre and facility type, Ethiopia EmONC, 2016

	Facilities with at least one of the cadre on staff		Among facilities with at least one of the cadre on staff, the percent where that cadre provides:						
	%	number	Newborn resuscitation with bag and mask	Antenatal corticosteroids	Antibiotics for pPROM	Antibiotics for neonatal sepsis	KMC for small babies	Safe administration of oxygen	IV fluids
Hospitals/MCH specialty centres	n=316								
Health worker cadre									
MD (general practitioner)	85%	270	53%	37%	48%	63%	42%	59%	51%
Obstetrician/gynaecologist	43%	135	73%	78%	44%	54%	54%	76%	61%
Paediatrician/neonatologist	28%	90	72%	11%	14%	73%	51%	78%	73%
Emergency surgical officer	65%	206	78%	6%	12%	67%	42%	70%	67%
Midwife	98%	309	98%	70%	88%	80%	88%	84%	66%
Nurse	99%	313	63%	30%	45%	68%	60%	64%	59%
Health officer	64%	201	44%	23%	40%	43%	36%	40%	34%
Anaesthesiologist (MD)/nurse anaesthetist	88%	279	30%	8%	10%	9%	9%	34%	23%
Health centres/clinics[1]	n=3,488								
Health worker cadre									
MD (general practitioner)	1%	49	49%	37%	53%	47%	33%	43%	39%
Obstetrician/gynaecologist	1%	26	92%	73%	100%	56%	50%	69%	50%
Paediatrician/neonatologist	0%	7	100%	14%	14%	86%	86%	86%	71%
Emergency surgical officer	1%	22	77%	0%	0%	0%	0%	0%	0%
Midwife	97%	3,371	98%	25%	78%	78%	91%	14%	26%
Nurse	100%	3,478	83%	18%	61%	74%	73%	11%	24%
Health officer	87%	3,045	88%	26%	73%	81%	76%	13%	29%
Anaesthesiologist (MD)/nurse anaesthetist	1%	25	38%	8%	25%	21%	17%	42%	33%

KMC = kangaroo mother care; pPROM = preterm premature rupture of membranes.

[1] Includes MCH specialty clinics and higher clinics.

More than 80 percent of hospitals and MCH specialty centres with midwives reported that midwives provided most other essential obstetric services and procedures, other than permanent family planning methods (tubal ligation and vasectomy). Nurses were also important providers of the non-surgical essential services; ESOs were important providers of all these services, including tubal ligation and vasectomy. Medical doctors and health officers played a smaller role than midwives in the provision of other essential obstetric services in hospitals and MCH specialty centres: these cadres provided the other essential services in fewer than 45 percent of hospitals where they were posted.

In the health centres/clinics, the same team of a midwife, nurse and health officer were available and able to provide most of these other essential services, except for permanent family planning methods, which were essentially only available in a handful of health centres/clinics.

Table 7.4.4: Percent and number of facilities with at least one health worker in selected cadres on staff, and among those, percent of facilities where that cadre provides other essential services, by health worker cadre and facility type, Ethiopia EmONC, 2016

	Facilities with at least one of the cadre on staff		Among facilities with at least one of the cadre on staff, the percent where that cadre provides:									
	%	number	Focused ANC	Normal delivery	Fill out and use partograph	Immediate newborn care	PMTCT	FP counselling	Temporary FP methods	Long acting reversible FP methods	Tubal ligation	Vasectomy
Hospitals/MCH specialty centres	n=316											
Health worker cadre												
MD (general practitioner)	85%	270	33%	38%	29%	35%	34%	34%	25%	22%	11%	9%
Obstetrician/gynaecologist	43%	135	63%	79%	56%	64%	63%	71%	46%	64%	84%	66%
Paediatrician/neonatologist	28%	90	7%	6%	2%	29%	22%	17%	9%	9%	7%	6%
Emergency surgical officer	65%	206	58%	67%	62%	70%	51%	62%	49%	53%	59%	38%
Midwife	98%	309	94%	97%	93%	99%	94%	96%	94%	81%	4%	4%
Nurse	99%	313	56%	44%	38%	53%	57%	68%	66%	48%	2%	1%
Health officer	64%	201	37%	37%	31%	38%	44%	42%	40%	29%	3%	2%
Anaesthesiologist (MD)/ nurse anaesthetist	88%	279	2%	4%	3%	15%	2%	4%	2%	1%	1%	0%
Health centres/clinics[1]	n=3,488											
Health worker cadre												
MD (general practitioner)	1%	49	41%	53%	37%	43%	43%	37%	24%	22%	6%	2%
Obstetrician/gynaecologist	1%	26	81%	88%	62%	81%	65%	77%	46%	69%	27%	19%
Paediatrician/neonatologist	0%	7	14%	14%	0%	57%	29%	0%	0%	0%	14%	0%
Emergency surgical officer	1%	22	68%	82%	73%	73%	64%	64%	59%	68%	23%	9%
Midwife	97%	3,371	99%	100%	91%	99%	87%	99%	98%	86%	0%	0%
Nurse	100%	3,478	89%	90%	70%	89%	75%	94%	94%	70%	0%	0%
Health officer	87%	3,045	86%	91%	75%	89%	76%	89%	86%	63%	1%	0%
Anaesthesiologist (MD)/ nurse anaesthetist	1%	25	21%	17%	8%	17%	13%	13%	13%	8%	0%	0%

ANC = antenatal care; FP = family planning; PMTCT = prevention of mother-to-child transmission (of HIV).

[1] Includes MCH specialty clinics and higher clinics.

Tables 7.4.5A and 7.4.6A (pages 365 and 366 in the Appendix) show, by region, the percentage of facilities with at least one health worker who can provide each of the EmONC and EmNeC signal functions, and other essential services, by facility type.

From the perspective of human resource availability, regional coverage of parenteral administration of critical drugs and manual removal of placenta was virtually universal in hospitals (Table 7.4.5A page 365 in the Appendix). HR coverage for other EmONC signal functions was quite high, though blood transfusion for the mother was the lowest (particularly in Amhara, Benishangul-Gumuz, and SNNP). With regard to removal of retained products using MVA, E&C or D&C and medical abortion, the majority of hospitals/MCH specialty centres in all regions had at least one health care worker who could remove retained products; the one exception was Gambella region, where no hospitals/MCH specialty centres had a health care worker who could provide medical abortion services for diagnosed first trimester pregnancy.

Regarding emergency newborn signal functions, national coverage in hospitals/MCH specialty centres was lowest for antenatal corticosteroids for preterm labour (87 percent). All hospitals/MCH specialty centres in Afar, Benishangul-Gumuz, Gambella, Harari and Dire Dawa had at least one health care worker who could provide this signal function, but only 78 and 81 percent of hospitals in SNNP and Amhara did, respectively. Nearly 100 percent of hospitals/MCH specialty centres in all regions had at least one health care worker who could provide the rest of the EmNeC signal functions, except for oxygen in Benishangul-Gumuz (67 percent) and IV fluids in Dire Dawa (67 percent) and Harari (71 percent).

The national coverage of HR for other essential services was very high (93 percent or higher) in hospitals/MCH specialty centres, except for tubal ligation and vasectomy (67 and 49 percent, respectively). In Gambella region, despite HR coverage for caesarean deliveries in 100 percent of hospitals/MCH specialty centres, no health care workers could provide vasectomy in those same facilities.

Eighty-seven percent or more of health centres and clinics in the country were staffed to provide parenteral antibiotics, uterotonics and anticonvulsants, as well as manual removal of placenta (Table 7.4.6A page 366 in the Appendix). The availability did not vary much across regions, though HR for anticonvulsants was available in fewer than three-quarters of health centres/clinics in SNNP. Nationally, about half of health centres/clinics were staffed to provide MVA and vacuum extraction. Approximately one in four health centres/clinics in Somali and Gambella were staffed for MVA, and fewer than half were staffed for vacuum extraction in Oromia, Somali, SNNP, and Gambella. Tigray, Harari and Dire Dawa stood out as being well-staffed to provide medical abortion at health centres/clinics. Only 1 percent of health centres and clinics in the country were staffed to provide caesarean delivery, blood transfusion for the mother, and vasectomy services, though their provision was generally not expected at health centre/clinic level.

Finally, with respect to emergency newborn care, nationally health centres/clinics were well-staffed to provide 4 of the 7 EmNeC signal functions (newborn resuscitation, antibiotics for pPROM and neonatal sepsis, and KMC). This held across regions, though in SNNP just 57 percent of health centres were staffed to provide antibiotics for pPROM (Table 7.4.6A page 366 in the Appendix). Only 38 percent of health centres/clinics in Harari were staffed to provide KMC for small babies (well below the national level of 91 percent). Safe administration of oxygen was rarely available in health centres/clinics, though 87 percent of these facilities in Addis Ababa reported having staff on hand who could provide the service. Regarding

other essential services, HR availability across regions mirrored national availability, which was quite high for all services except permanent family planning methods. The one exception was Somali that lacked HR coverage for partograph use, PMTCT, and long-acting reversible family planning methods.

7.5 Ratios of midwives to 1,000 institutional deliveries and 5,000 population

The number of midwives available per 1,000 deliveries gives an indication of the workload they bear. A benchmark sometimes used to plan a midwifery workforce is that 1 midwife can attend an average of 175 births during a typical year[43]. This is more easily conceptualized as 6 midwives required to provide care for 1,000 births in a year; therefore, the ratio we would like to see is 6 or more midwives per 1,000 deliveries. Though, some sources indicate that a ratio of 150 deliveries per midwife or 7 midwives per 1,000 deliveries is more appropriate for Ethiopia, given the scope of work midwives are expected to carryout.[44]

Table 7.5.1 shows the number of midwives for every 1,000 institutional deliveries, along with the number per 5,000 population for each region. These figures were calculated using the number of institutional deliveries conducted at a facility within the 12-months prior to the assessment period.

Nationally, and in all regions except Oromia, we saw 6 or more midwives per 1,000 annual institutional deliveries. Somali region had the highest number of midwives attending 1,000 institutional deliveries (34), followed by Afar (24) and Benishangul-Gumuz (17). These high ratios of midwives to institutional deliveries indicate that facilities in these regions were staffed-up in preparation for an eventual increase in institutional deliveries. Currently, however, these three regions had the lowest institutional delivery rates, between 12 and 37 percent (compared to 66 percent at the national level – Table 3.3.1).

[43] United Nations Population Fund. The State of the World's Midwifery 2011. New York: United Nations Population Fund, 2011.

[44] Federal Ministry of Health, UNFPA. National Road Map for Midwifery Education and Service Provision 2016-2025: Midwifery Initiative Program. FMOH/UNFPA, Addis Ababa, Ethiopia: 2015.

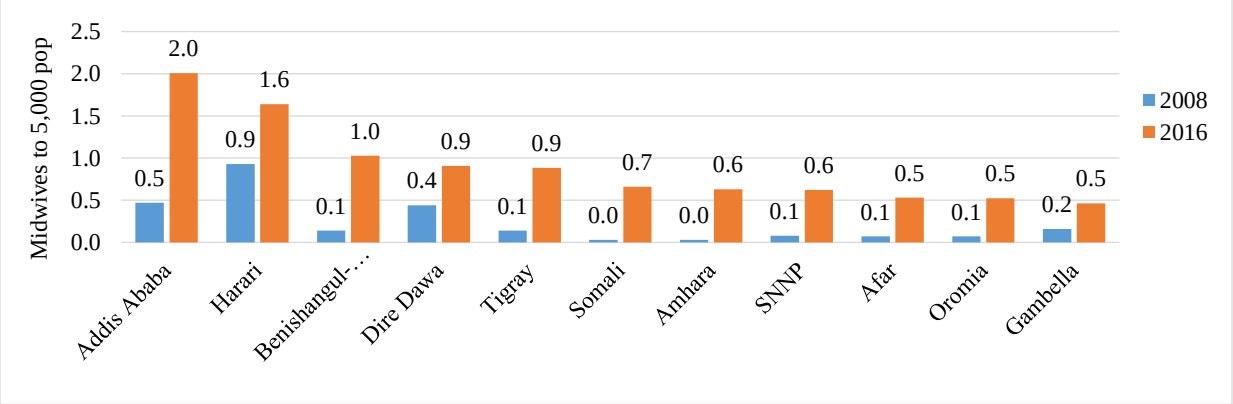
Table 7.5.1: Number of midwives per 1,000 institutional deliveries and per 5,000 population, by region, Ethiopia EmONC, 2016

	Population[1]	Number of deliveries in facilities	Number of midwives in facilities	Number of midwives per 1,000 institutional deliveries	Number of midwives per 5,000 population
National	92,085,000	1,924,330	12,153	6	0.7
Region					
Tigray	5,151,000	113,425	911	8	0.9
Afar	1,768,000	7,678	188	24	0.5
Amhara	20,771,000	386,131	2,610	7	0.6
Oromia	34,575,000	844,287	3,619	4	0.5
Somali	5,599,000	22,036	741	34	0.7
Benishangul-Gumuz	1,035,000	12,288	213	17	1.0
SNNP	18,720,000	417,697	2,327	6	0.6
Gambella	422,000	3,383	39	12	0.5
Harari	238,000	7,579	78	10	1.6
Addis Ababa	3,353,000	101,401	1,345	13	2.0
Dire Dawa	453,000	8,425	82	10	0.9

[1] Source: FMOH. Health and Health Related Indicators 2015/2016. Addis Ababa: Planning and Programming Department: 2016.

In relation to the ratio of midwives per 5,000 population, Benishangul-Gumuz, Harari, and Addis Ababa regions met the ratio of 1 midwife per 5,000 population based on international benchmarks[45] (Figure 7.5.1). At the time of the 2008 national EmONC assessment, no regions met the target, though Harari had the highest ratio (0.9). All regions have seen an improvement since 2008 in this benchmark, with more than a 20-fold increase in Somali and Amhara.

Figure 7.5.1: Number of midwives per 5,000 population in 2008 and 2016, by region, Ethiopia EmONC, 2016



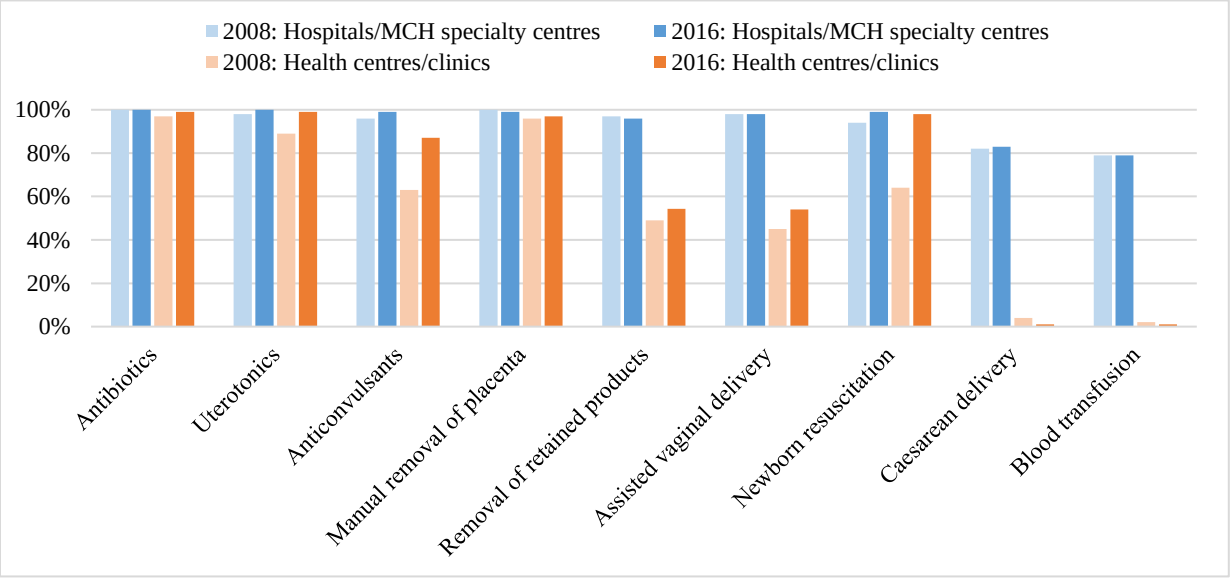
[45]Federal Ministry of Health. National human resource for health strategic plan for Ethiopia 2016-2055, FMOH, 2016.

7.6 Comparisons between 2008 and 2016

Figure 7.6.1 presents a comparison between HR availability to provide the EmONC signal functions in 2008 and 2016, by facility type. (Details by managing authority can be found in Table 7.6.1A page 367 in the Appendix). In hospitals/MCH specialty centres, HR availability for provision of parenteral uterotonics, anticonvulsants, newborn resuscitation with bag and mask, and caesarean delivery remained high and increased slightly since 2008. Virtually no changes were observed in the HR availability for parenteral antibiotics, manual removal of placenta, removal of retained products, assisted vaginal deliveries, or blood transfusion in hospitals/MCH specialty centres.

In health centres and clinics, the availability of at least one health worker to provide EmONC signal functions increased for all signal functions except caesarean delivery and blood transfusion. The lower availability of HR for these two comprehensive EmONC signal functions in health centres/clinics may be due to how uncommon it is for a health centre or clinic to provide these services. However, the substantial increase in the availability of HR to provide parenteral anticonvulsants (63 percent to 87 percent) and neonatal resuscitation (64 percent to 98 percent) is noteworthy. These rates of increase are impressive when considering that the absolute number of health facilities in Ethiopia increased almost 5-fold since 2008.

Figure 7.6.1: Percent of facilities with at least one health worker on staff who could perform each EmONC signal function in 2008 and 2016, by facility type, Ethiopia EmONC, 2016



Finally, the percent of facilities where the minimum team of 1 midwife and 1 nurse were present increased for all facility types and managing authorities, most impressively in health centres/clinics (from 64 percent in 2008 to 96 percent in 2016), and public/government facilities (68 percent in 2008 to 97 percent in 2016) (Table 7.6.1A page 367 in the Appendix).

Chapter 8: Interviews with Service Providers

Key Findings

- Very few providers of any cadre had a written copy of their job description, and fewer than half reported a clear reporting structure (clinical or administrative).
- Midwives were much more likely to have received training on critical procedures than nurses or health officers; yet, health officers were often as likely as midwives to report having provided the same procedures recently. Health officers also scored similarly to midwives on most knowledge questions.
- All provider cadres scored substantially better on aspects of routine intrapartum and newborn care than on care for obstetric and newborn complications.
- A substantial proportion of providers (13 percent) indicated that they would never give a loading dose of magnesium sulphate; among nurses, this was 20 percent of respondents.
- All cadres scored similarly on perceptions of supervisory support. Out of 100, scores ranged from 65 to 70; a modestly positive result.
- In general, motivation appeared high. Medical doctors appeared to be the most motivated and perceived themselves as well supported (despite the small numbers from which the generalization is made) while health officers, compared to doctors, midwives and nurses, were the least satisfied with their jobs.
- When asked what could be done to improve the quality of services they provided, the desire for more knowledge, updates, and training was ranked as the top priority for all health worker categories (from among a list of 10 items).

The assessment included one face-to-face interview with a provider in the maternity to assess provider knowledge around maternal and newborn care, and a self-administered assessment of provider perceptions of supervisory support and motivation. The data collectors selected the person who: 1) had delivered the largest number of babies in the past month, and 2) was available to be interviewed at the time of the visit. The data collector explained the purpose of the interview, assured the provider that no names would be recorded, and requested consent to continue the interview.

After collecting basic provider characteristics and information on training received and services provided, data collectors read knowledge questions aloud and providers offered spontaneous responses. The data collectors recorded answers using pre-coded categories of responses. Prompting was limited to "anything else?"

At the completion of the face-to-face interview, providers were asked to complete a short-self-administered questionnaire about supervisory support and motivation. Self-administration was used because of the possible sensitivity of questions which focused on providers' working conditions. Once the self-administered questionnaire was completed, it was stored in a sealed, unmarked envelope and later entered into a separate database. No identifying information was collected in the self-administered questionnaire that would permit linking the provider with the facility where they worked or with their answers on the knowledge assessment.

8.1 Profile of respondents of knowledge questions

Four persons out of 3,804 did not consent to be interviewed for the face-to-face interview (data not shown). Most respondents were diploma midwives (73 percent), followed by BSc midwives (11 percent), and diploma nurses (10 percent) (Table 8.1.1). Most respondents were female (63 percent), though the sex distribution varied by cadre, facility type and managing authority. For example, slightly more than one-third of BSc midwives interviewed were female; whereas almost three-quarters of diploma midwives were. One-quarter of health officers interviewed were female. Sex distribution by facility type indicates an even split at referral and primary hospitals. In all other facility types, 64 percent or more of respondents were female.

The average respondent was 26 years old, had been posted to the current facility for 2 years, and had been practicing with current qualification for just over 3 years. Medical doctors were substantially older than average (36 years) and had been practicing for much longer (10 years). Diploma midwives reflected the average respondent, yet BSc midwives had been practicing for fewer years than average, and had been at the current facility for a shorter time. Respondents at health centres and primary hospitals were the newest to their profession (3 years); whereas, MCH specialty centres had the most experienced respondents with almost 7 years of practice in their current qualification. Years of practice was more than twice the average in private-for-profit facilities.

Midwives reported attending around 21 deliveries per month, exceeded by 4 medical doctors who reported delivering 24 deliveries per month. The monthly average of deliveries conducted by nurses was between 11 and 12, followed by Health Officers who attended on average 9 deliveries per month

All subsequent tables from the knowledge assessment compare health officers (HOs), midwives (B.Sc. and diploma) and nurses (B.Sc. and diploma). The 4 medical doctors and the 4 “other” types of health workers were excluded due to their small numbers.

Table 8.1.1: Percent distribution of providers, by cadre, facility type, and managing authority, and distribution of providers according to demograpic and professional characteristics, by cadre, facility type, and managing authority,[1] Ethiopia EmONC, 2016

	Providers interviewed		Characteristics			Professional experience				
			Sex		Mean age (in years)	Mean number of deliveries attended in past month	Mean number of years at current facility	Mean number of years since receiving professional qualification	Number of providers who have had qualification for ≥3 years	Among them, mean number of different health facilities posted to in past 3 years
	n	%	Female	Male						
National	3,800	100%	63%	37%	25.7	19.3	2.0	3.2	1,634	1.7
Health worker cadre										
MD (general practitioner)	4	0%	50%	50%	36.3	24.5	1.8	9.7	4	2.3
Midwife (BSc)	407	11%	37%	63%	25.8	21.1	1.4	2.4	88	1.7
Midwife (Diploma)	2,786	73%	74%	26%	25.5	20.8	1.9	3.2	1,223	1.7
Nurse (BSc)	86	2%	42%	58%	28.1	12.1	3.2	3.7	38	1.6
Nurse (Diploma)	370	10%	35%	65%	26.7	11.1	2.8	4.6	249	1.6
Health officer	143	4%	25%	76%	25.8	8.8	1.5	2.0	31	1.7
Other[2]	4	0%	0%	100%	32.3	1.5	1.0	3.8	1	4.0
Facility type										
Referral/specialized hospitals	30	1%	50%	50%	27.8	25.8	3.0	4.8	13	1.7
General hospitals	103	3%	68%	32%	28.4	16.2	3.0	5.1	56	2.1
Primary hospitals	160	4%	48%	52%	26.7	18.7	1.8	3.3	64	2.2
MCH specialty centres	23	1%	87%	13%	31.0	10.2	2.9	6.8	14	1.9
Health centres	3,455	91%	64%	36%	25.5	19.4	1.9	3.1	1,467	1.6
MCH specialty clinics	16	0%	69%	31%	28.6	7.5	1.2	4.7	9	2.4
Higher clinics	13	0%	69%	31%	28.3	8.6	3.8	5.5	11	2.0
Managing authority										
Public/government	3,658	96%	63%	37%	25.6	19.6	1.9	3.1	1,536	1.7
Private-for-profit	83	2%	82%	18%	28.5	6.4	3.2	6.7	54	2.4
Private-not-for-profit[3]	59	2%	66%	34%	29.6	12.8	3.5	5.5	44	1.5

[1] Non-response varies and does not exceed 3.6%. Non-responses are excluded.

[2] Other health worker cadres include emergency surgical officers and health extension practitioners.

[3] Includes NGO, faith-based, or mission facilities.

Providers were asked general questions about the management and working conditions of their facility (Table 8.1.2). Forty-five percent or fewer of respondents knew of a written management structure or organogram, and thought that the reporting structure for administrative or clinical purposes was clear. Health officers were less likely than midwives or nurses to respond positively to these aspects of management. Fewer than one-quarter of respondents reported that there was a written job description for their position, and only 16 percent had a copy.

Table 8.1.2: Management and working conditions in facilities, by health worker cadre, Ethiopia EmONC, 2016

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
Management structure				
Provider knows of written management structure or organogram that details reporting relationship	45%	46%	40%	34%
Reporting structure for administrative purposes is clear	43%	44%	38%	32%
Reporting structure for clinical purposes is clear	42%	44%	36%	32%
Job description				
Written job description exists for position	23%	23%	24%	21%
Job description exists and provider has a copy	16%	15%	18%	17%
Reporting				
Ever complete or make reports that are sent to the next administrative level	89%	89%	84%	84%
Ever received training on how to complete registers, compile reports, use statistics	26%	25%	32%	29%
Last received on-the-job training in MNH				
Never	21%	17%	41%	45%
In last 6 months	43%	45%	30%	36%
In last year	17%	18%	14%	11%
More than a year ago	19%	20%	14%	8%
Provider reports that facility is large enough to promote staff rotation to different areas of the facility	91%	91%	93%	92%
Among providers in facilities that are large enough to promote staff rotation	n=3,453	n=2,897	n=424	n=132
Facility has a policy that promotes staff rotation	40%	39%	46%	39%

Almost 90 percent of providers indicated that they made and sent reports upward to the next administrative level, though just 26 percent indicated that they had been trained to compile those reports, complete registers or use facility statistics.

Around 80 percent of providers indicated that they had received on-the-job training in MNH, with 43 percent having received it in the last 6 months, and 19 percent receiving it more than one year ago.

A large majority of providers reported that their facility was large enough to support the practice of staff rotation to different areas of the facility; though just 40 percent reported that their facility had a policy supporting this practice.

8.2 Training and recent delivery of services

More than 85 percent of providers interviewed reported providing AMTSL, contraception counselling, postnatal care, IV fluids, FANC, and essential newborn care in the last 3 months (Figure 8.2.1 and Table 8.2.1A, page 368 in the Appendix). Fewer than one-quarter of respondents reported providing MVA, magnesium sulphate, internal bimanual uterine compression, antenatal corticosteroids, cervical sutures, and forceps deliveries.

In general, midwives were the most likely to have provided the services, except for emergency triage, provision of newborn antibiotics, and adult resuscitation where HOs and nurses were more likely than midwives to have provided the service.

As with provision, midwives were more likely than the other cadres to report being trained in the services, except for emergency triage, newborn antibiotics, and adult resuscitation where HOs were the most likely to have been trained (Figure 8.2.2). In all services, nurses were less likely than midwives and HOs to have received training. Fewer than 50 percent of all respondents, regardless of cadre, reported receiving training in emergency triage, antenatal corticosteroids, cervical sutures, and forceps delivery.

Figure 8.2.1: Percent of providers who provided selected services in the past 3 months, by health worker cadre, Ethiopia EmONC, 2016

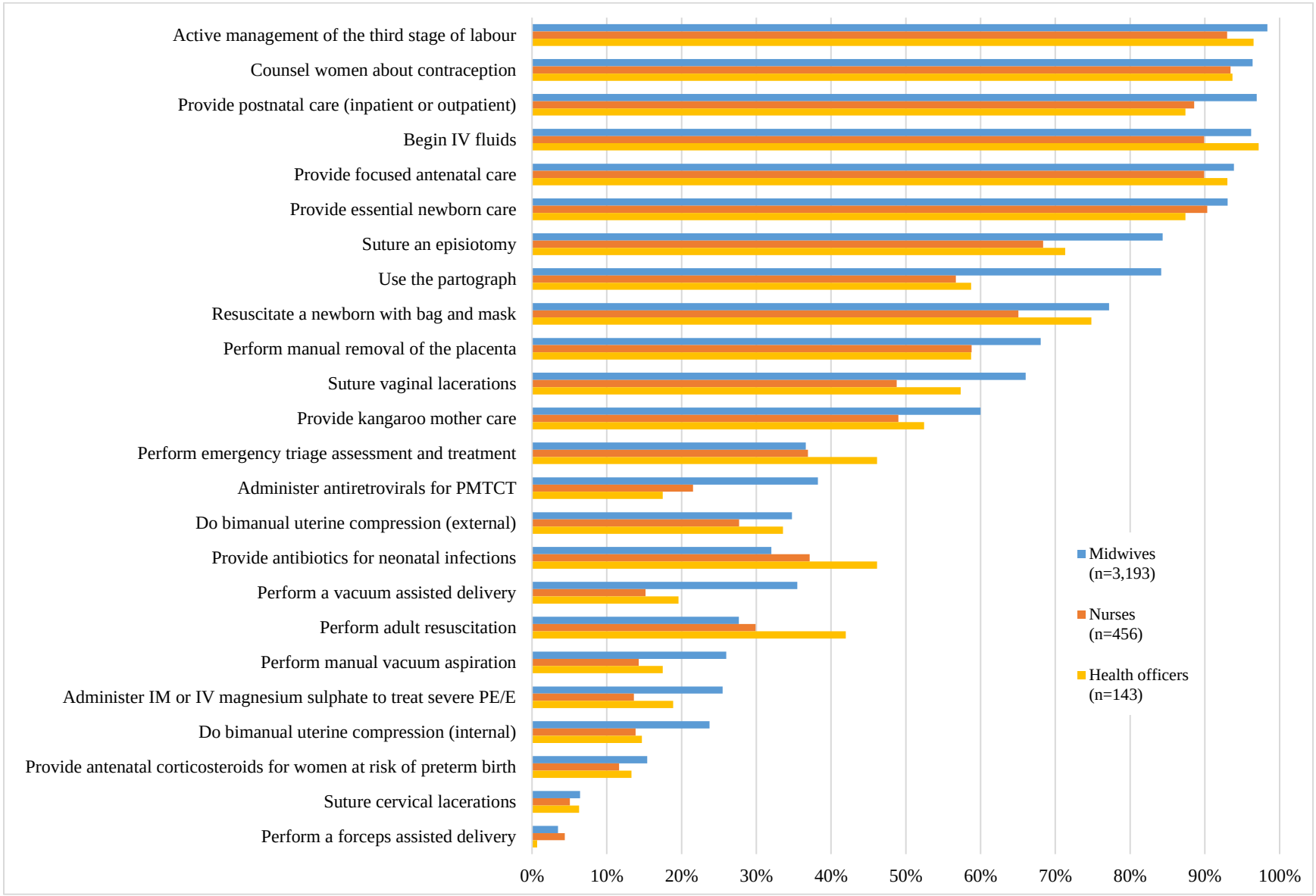
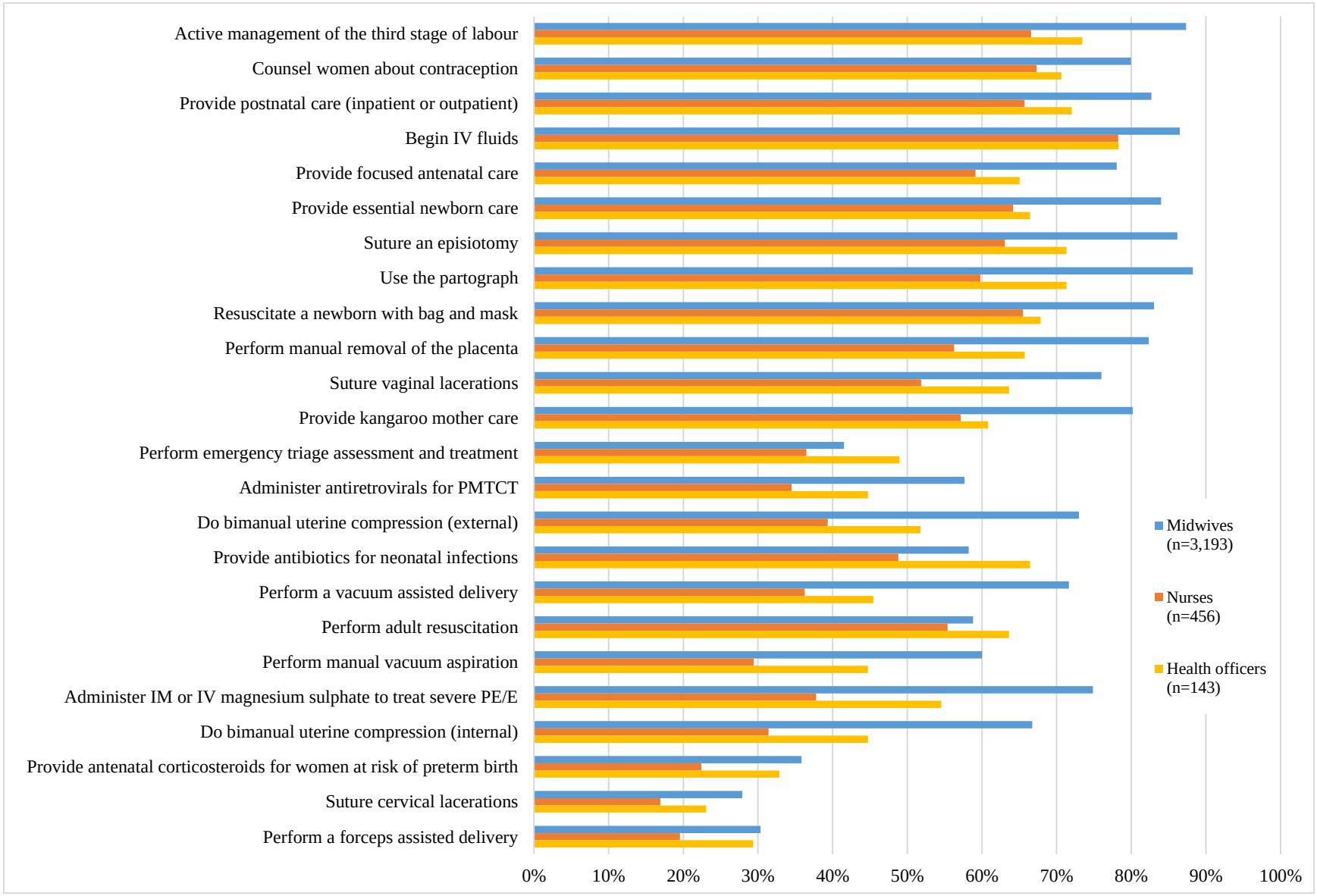


Figure 8.2.2: Percent of providers who ever received training on selected services, by health worker cadre, Ethiopia EmONC, 2016

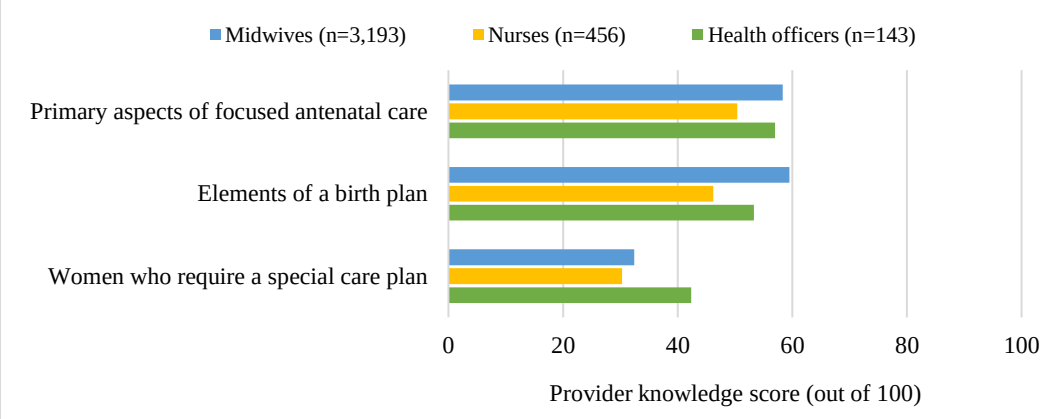


8.3 Knowledge of care during pregnancy

Knowledge questions were administered for four topics: antenatal care, intrapartum and immediate newborn care, care after delivery, and abortion. Each knowledge question had multiple "correct" answers; that is, responses that respondents were expected to provide spontaneously. Respondents were scored on each question by calculating the number of correct responses provided out of the total possible, and standardizing this to a scale of 100. Average scores were then calculated for each question, aggregated by cadre, and presented in summary figures. In Appendix A, detailed tables can be found that present the same average scores along with the percent of providers that mentioned each correct answer.

The first question asked respondents to list the components of focused antenatal care. Up to eight answers were accepted (prevent illness and promote health, teach danger signs, nutrition counselling, minimum of four consultations, detect existing illnesses and manage complications, ensure a woman has a birth preparedness plan, counsel on FP, and promote breastfeeding). Midwives and HOs provided just under 60 percent of possible responses (Figure 8.3.1). Nurses spontaneously provided half. Of the six possible responses, 35 percent or fewer of respondents mentioned FP counselling and breastfeeding promotion (Table 8.3.1A page 369 in the Appendix).

Figure 8.3.1: Provider knowledge scores related to antenatal care, by health worker cadre, Ethiopia EmONC, 2016



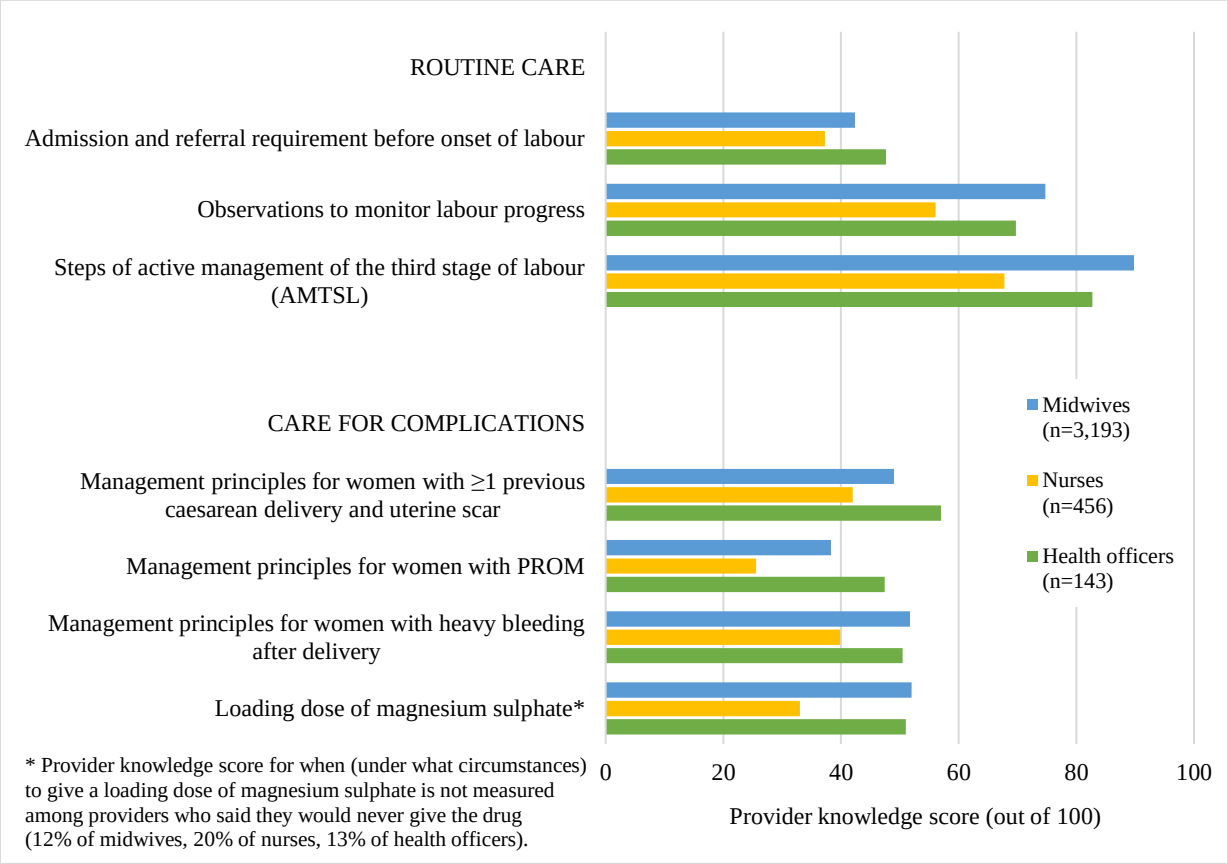
Looking more closely at the question about pregnant women who require a special care plan and where respondents scored the highest and the lowest, more than half of providers spontaneously indicated that women with a history of obstetric complications or a non-communicable disease, and women with a previous caesarean delivery should have a special care plan (Table 8.3.1A page 369 in the Appendix); whereas, fewer than a quarter of respondents mentioned very young or older mothers, women with 5+ deliveries, a previous neonatal death, instrumental delivery or fistula repair, or a short birth interval.

8.4 Knowledge of intrapartum and immediate newborn care

Respondents scored highest on intrapartum knowledge questions related to AMTSL and observations to monitor labour progress, and lowest on those related to management principles of premature rupture of

membranes (PROM) (Figure 8.4.1). In general, respondents scored higher on aspects of routine intrapartum care than on aspects of complications management. Nurses consistently scored lower than HOs and midwives. HOs and midwives typically scored within 5 points of each other except on steps of AMTSL where midwives scored higher than HOs, and management principles of previous caesarean delivery and PROM where HOs scored higher than midwives.

Figure 8.4.1: Provider knowledge scores related to routine and complicated intrapartum care, by health worker cadre, Ethiopia EmONC, 2016



Regarding referral requirements before labour onset, the item most often mentioned was severe pre-eclampsia/eclampsia (83 percent mentioned), and the least often mentioned was deep vein thrombosis, just 5 percent of providers mentioned this reason for referral (Table 8.4.1A in the Appendix page 370). Overall, 79 percent or more of providers could spontaneously recall many of the key assessments taken during labour, including foetal heartbeat, cervical dilatation, and maternal blood pressure, pulse and temperature. However, just 32% of respondents mentioned urine output. Similarly, most providers recalled the three key actions taken during AMTSL, though just 51 percent of nurses mentioned checking uterine tone.

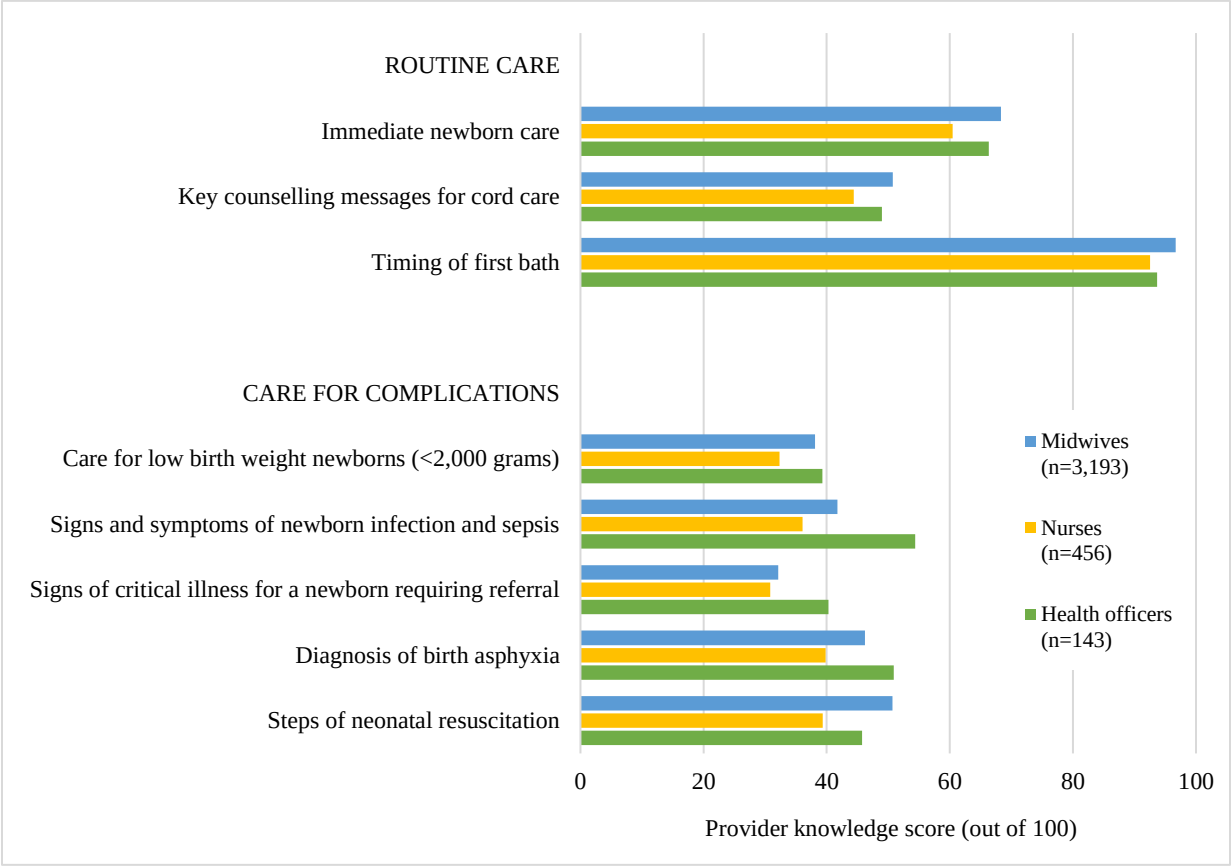
Regarding management principles for PROM, the most common response was to administer antibiotics (Table 8.4.2A in the Appendix page 371). Half or fewer of respondents indicated other principles such as to avoid digital pelvic exams, plan for delivery in case of severe complications, or administer corticosteroids for very preterm PROM. HOs were more likely than midwives or nurses to have mentioned these other

principles. Regarding providing a loading dose of magnesium sulphate, between 12 and 20 percent of respondents, depending on cadre, indicated that they would never give magnesium sulphate. Among those who said they would provide the drug, two-thirds or more mentioned they would deliver the loading dose for pregnancy or recently delivered woman showing signs of severe pre-eclampsia or having a seizure. Nurses scored much lower than midwives and HOs.

Tables 8.4.3A and 8.4.4A (see the Appendix pages 372 and 373) present details of results on critical questions about immediate newborn care and management of newborn morbidity, beginning with "What do you do for the newborn following delivery?"

Except for questions on elements of immediate newborn care and timing of the first bath, scores indicate that approximately half or fewer of the responses were mentioned (Figure 8.4.2). For immediate newborn care, midwives and health officers scored similarly – on average mentioning 66-68 percent of 13 possible responses. The most commonly provided response was "clamp the cord after 1-3 minutes" (Table 8.4.3A in the Appendix, page 372).

Figure 8.4.2: Provider knowledge scores related to routine and complicated newborn care, by health worker cadre, Ethiopia EmONC, 2016



Out of a possible 4 cord counselling messages, on average midwives and HOs spontaneously mentioned about half of them; nurses mentioned just 44 percent. "Put nothing on the cord while waiting for it to fall

off" was the most frequent answer, followed by "cord should remain dry." Overall, fewer than 15 percent of providers mentioned applying chlorhexidine; though, 20 percent of HOs did mention this important message.

All cadres scored low when asked how to care for a low birth weight newborn. Of 9 possible measures, HOs and midwives spontaneously mentioned just under 40 percent, while nurses mentioned one third. The most common response by far was "ensure baby is warm with skin-to-skin with mother" (Table 8.4.4A in the Appendix, page 373). On average 85 percent of providers mentioned this measure. Other responses were mentioned by at best 55 percent of providers ("provide extra support to establish breastfeeding"), and at worst just 11 percent ("monitor baby for first 24 hours").

When asked about symptoms of infection in the newborn, 2 out of 5 responses were mentioned most frequently: "temperature $\geq$ 38 degrees C", followed by "poor feeding." Health officers were 12 percentage points more likely to mention these responses than midwives, and around 20 percentage points more likely than nurses.

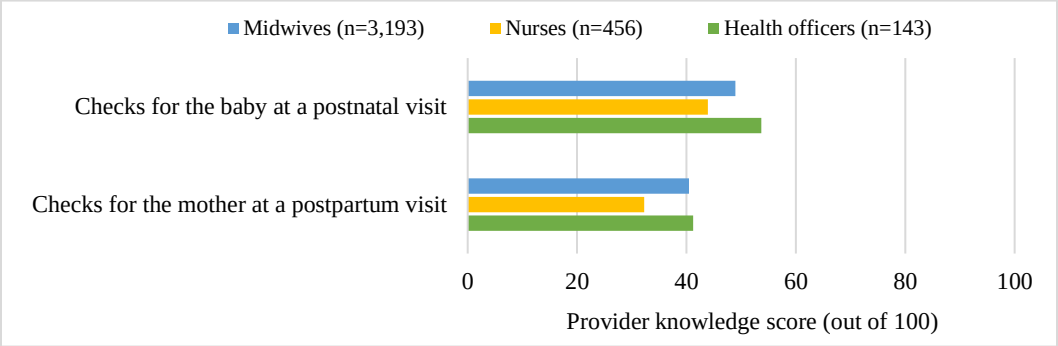
Providers scored quite low when asked to indicate the signs of critical illness in a newborn that would require referral. Inability to feed and respiratory distress were by far the most commonly provided responses by all cadres. All other responses were provided by around one-third or fewer of respondents.

HOs and midwives could describe how to diagnose birth asphyxia marginally better than nurses (51, 46, and 40 percent of 4 answers mentioned, respectively). Mentioned most frequently was "depressed breathing"; mentioned least was "floppiness." When asked what the preliminary steps of newborn resuscitation were, HOs and midwives mentioned on average 46 percent and 51 percent of 7 responses, respectively. "Start ventilation using bag and mask" was mentioned most frequently and "explain to mother condition of the baby" the least. Fewer than 15 percent of providers mentioned the steps of neonatal resuscitation in the proper order.

8.5 Knowledge of care after delivery

Providers were asked to indicate the assessments that should be made of women and newborns during a postpartum/postnatal check. On average, respondents mentioned around half of checks for the baby, and 40 percent of the postpartum checks for women (Figure 8.5.1). Health officers scored slightly higher than midwives on baby checks; though, on checks for the mother, midwives and health officers scored similarly (40 and 41, respectively). In both cases, nurses scored substantially lower than the other cadres.

Figure 8.5.1: Provider knowledge scores on components of postnatal and postpartum care, by health worker cadre, Ethiopia EmONC, 2016



The most commonly mentioned newborn postnatal check was whether the newborn was breastfeeding well (86 percent), followed by checking the umbilical cord stump (79 percent) (Table 8.5.1A in the Appendix, page 375). Alertness of the baby and condition of the newborn's eyes were rarely mentioned.

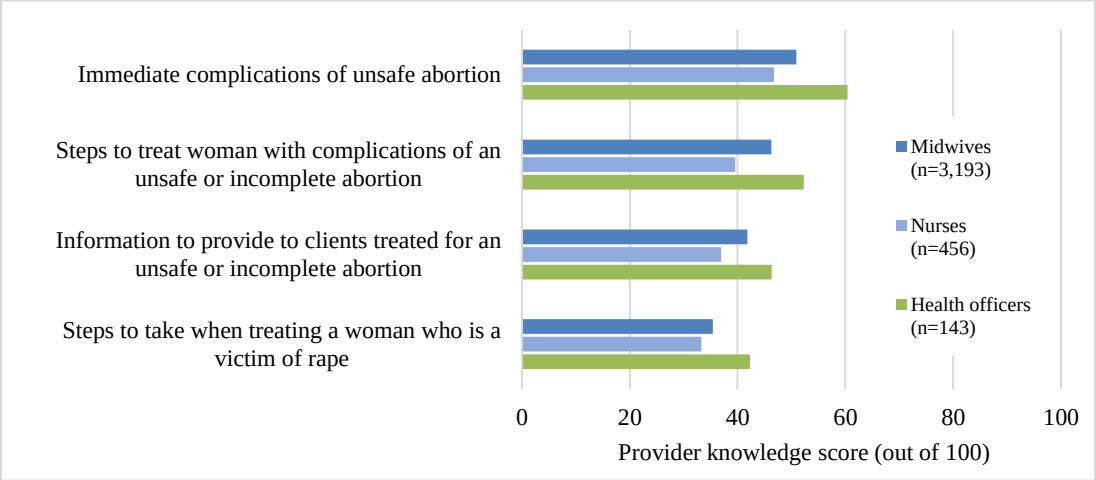
The most commonly mentioned postpartum checks for the mother were vaginal bleeding (86 percent), followed by blood pressure (82 percent). Breathing difficulties, urinary incontinence, signs of depression, and deep vein thrombosis were mentioned rarely (<11 percent, overall).

8.6 Unsafe abortion and sexual violence

Respondents were asked a series of questions related to unsafe abortion and sexual violence: "What are the immediate complications of unsafe abortion?" "What do you do for a woman with an unsafe or incomplete abortion?" "What information do you give to clients after unsafe or incomplete abortion?" And lastly, "What do you do for the victim of sexual violence?"

Health officers mentioned more complications of unsafe abortion compared to the other two groups of health workers: HOs mentioned 60 percent of 5 possible responses and nurses mentioned 47 percent (Figure 8.6.1). Bleeding and sepsis were the two most common complications mentioned (Table 8.6.1A in the Appendix, page 376). Forty percent or fewer of respondents mentioned genital or abdominal injuries as possible complications of abortion.

Figure 8.6.1: Provider knowledge scores on complications of abortion, how to intervene, and what to do for victims of sexual violence, by health worker cadre, Ethiopia EmONC, 2016



Out of 10 possible responses to the question about what to do for a woman with complications of unsafe or incomplete abortion, HOs mentioned 52 percent and nurses less than 40 percent. Start IV fluids was the item mentioned most frequently by all groups (82 percent, overall), followed by beginning antibiotics (73 percent, overall). It is worth noting that MVA was mentioned by 51 percent of the providers while only 13 percent mentioned curettage. Regarding giving information to women experiencing unsafe or incomplete abortions, on average HOs mentioned 46 percent of the 7 possible responses while nurses only mentioned 37 percent. The top response for all groups was family planning counselling and services. For victims of sexual violence, HOs mentioned, on average, 42 percent of 8 possible actions, while midwives mentioned 35 percent and nurses just 33 percent. The specific actions most likely to be mentioned were pre- and post-HIV testing and counselling as well as emergency contraception, and to a lesser extent, pregnancy prevention counselling. On average, other items were mentioned by fewer than one-quarter of respondents.

8.7 Profile of providers who completed a self-administered questionnaire on supervisory support and motivation

The number of providers who completed the self-administered questionnaire on supervisory support and motivation (3,823) exceeded the 3,800 providers who completed the face-to-face interview because some respondents worked in facilities that were excluded from the full EmONC assessment analysis. Because the self-administered responses could not be linked to other facility information, there was no way to identify the providers working in facilities that were later excluded. The following tables present results from 3,813 providers after excluding 10 who failed to provide their professional category or fell under a category of "other;" this group was dropped from the analysis because it was considered too small to provide insight. We kept the medical doctors in the analyses despite the small number of doctors (n=12).

Table 8.7.1: Characteristics of health workers responding to supervision and motivation questions,[1,2] by health worker cadre, Ethiopia EmONC, 2016

	Total[3]	Medical doctors	Health officers	Midwives	Nurses
	n=3,813	n=12	n=170	n=3,175	n=456
Sex					
Female	63%	50%	30%	68%	38%
Male	37%	50%	70%	31%	62%
Mean age	25	34	26	25	27
Mean number of years at current facility	2.0	1.6	1.9	2.9	1.4
Mean number of hours per week spent in					
Current facility	80.2	69.3	77.9	81.6	72.2
Another facility	2.4	7.2	1.5	2.6	1.5
Mean number of years since receiving professional qualification	3.4	8.9	2.5	3.2	4.9
Number of providers in profession for 3+ years	n=2,029	n=6	n=116	n=1,731	n=176
Mean number of facilities posted to in past 3 years[4]	1.7	2.1	1.6	1.7	1.5

[1] Non-response varies across question and is between 3% and 6% of respondents. Non-responses are excluded.

[2] Extreme outliers (always <1%) are excluded from calculation of statistics.

[3] Ten providers were classified as "other/unknown" provider type and are excluded from this table (and all others)

[4] Measured among providers in profession for 3+ years.

The majority (63 percent) of respondents were female (Table 8.7.1). For all respondents, the mean age was 25; medical doctors were the oldest. The mean number of hours worked weekly was 80.2. We suspect that this average was pushed up by responses from staff who lived on the premises or very close by and were on duty much of the time. On average, only 2.4 hours were spent working at another facility during the week. Doctors spent more hours elsewhere than other cadres (7.2 hours). The mean number of years served at the current facility, and the mean number of years since receiving their professional qualification were 2 and 3.4, respectively. Midwives comprised most of the respondents, followed by nurses. Providers' self-reported profile matches fairly well the profile of the 3,800 providers who answered the knowledge questions (see the earlier Table 8.1.1).

8.8 Experience with supervision and perceptions of support

Most providers reported receiving supervision internally from someone at their own facility, or externally (Table 8.8.1). Approximately 50-60 percent of health worker categories reported supervision in the last 3 months. Nineteen percent overall reported never receiving supervision. The health worker category reporting the highest percentage of never receiving supervision were medical doctors (33 percent). Among

those who reported supervision, most supervisory visits entailed checking records (92 percent), observing staff work (84 percent), and providing feedback on performance (81 percent).

Table 8.8.1: Percent of health workers who received support and content of recent supervisory visit,[1] by health worker cadre, Ethiopia EmONC, 2016

	Total	Medical doctors	Health officers	Midwives	Nurses
	n=3,813	n=12	n=170	n=3,175	n=456
Technical support or supervision received from this facility or externally					
Never	19%	33%	24%	19%	21%
Yes, in the last 3 months	62%	50%	59%	63%	58%
Yes, in the last 12 months	12%	8%	15%	12%	13%
Yes, but longer ago than 12 months	4%	8%	0%	4%	4%
No response	3%	0%	2%	3%	5%
Number of providers who have ever received support/supervision	n=3,080	n=8	n=130	n=2,580	n=362
Type of support received in last supervisory visit[2]					
Checked records or reports	92%	88%	92%	93%	92%
Observed work	84%	88%	81%	84%	85%
Provided feedback (either positive or negative) on performance	81%	88%	80%	81%	85%
Provided updates on administrative or technical issues related to work	68%	100%	58%	68%	72%
Discussed problems encountered	76%	100%	66%	76%	79%
Provided clinical orientation mentoring/on-the-job training	61%	88%	52%	62%	60%

[1] Non-response varies across items. Maximum in any column is 5.0% missing. Non-responses are excluded.

[2] Measured among providers who have ever received support/supervision.

Respondents were provided with a set of questions that formed a scale around supportive supervision. The 16 items can be seen in Table 8.8.2. The Likert like response options ranged from strongly disagree to strongly agree (with no neutral option). Figure 8.8.1 reports the percent agreement with each statement (agreed or strongly agreed). For items that were negatively framed, we report the percent disagreement (disagreed or strongly disagreed), since that would be the positive response.

Table 8.8.2: Percent agreement/disagreement with supportive supervisory statements and overall score, by health worker cadre, Ethiopia EmONC, 2016

	Total	Medical doctors	Health officers	Midwives	Nurses
	n=3,813	n=12	n=170	n=3,175	n=456
Percent agreement[1]					
My supervisor values my contribution.	83%	92%	84%	83%	84%
My supervisor considers my goals and values.	80%	83%	79%	80%	80%
My supervisor tries to make my work as interesting as possible.	77%	91%	74%	77%	74%
My supervisor is proud of my accomplishments at work.	76%	83%	70%	76%	77%
Help is available from my supervisor when I have a problem.	75%	92%	69%	76%	75%
My supervisor really cares about my well-being.	74%	92%	66%	74%	77%
My supervisor cares about my opinions.	74%	83%	67%	74%	76%
My supervisor cares about my general satisfaction at work.	74%	83%	63%	74%	75%
My supervisor is willing to help when I need a special favour.	70%	83%	63%	70%	72%
Percent disagreement[1]					
My supervisor would ignore any complaint from me.	59%	58%	65%	59%	57%
Even if I did my best job possible, my supervisor would fail to notice.	55%	42%	70%	54%	55%
If my supervisor could hire someone to do my work at a lower salary, s/he would do so.[2]	55%	36%	67%	53%	59%
My supervisor does not regard my best interests when s/he makes decisions that affect me.	54%	58%	67%	53%	55%
My supervisor shows little concern for me.	52%	50%	67%	51%	57%
My supervisor fails to appreciate any extra effort from me.	48%	42%	64%	47%	51%
If given the opportunity, my supervisor would take advantage of me.[2]	38%	36%	44%	38%	37%
Overall score (percent of all items with which the respondent positively responded)[3]	70%	71%	72%	70%	72%

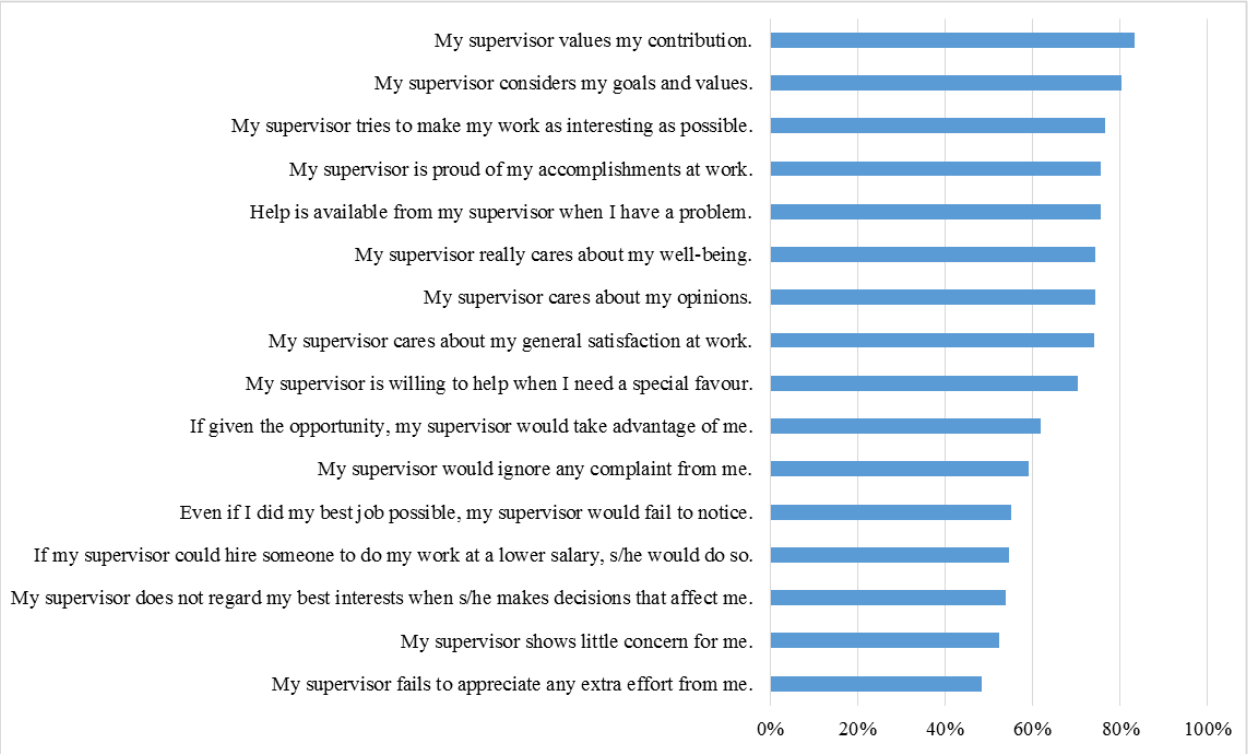
Cronbach's alpha is an internal consistency estimate. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale, thus it is widely believed to indirectly indicate the degree to which a set of items measures a single unidimensional latent construct, in this case perception of supervisory support. Scales of multiple items are considered more reliable than individual items. Cronbach's alpha was very high (0.95) and no items were dropped. Source: Gliem J, Gliem R. Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, 2003.

[1] Non-response varies across items. Maximum in any column is 5.3% missing, unless otherwise noted. Non-responses were excluded.

[2] Non-response >5.3% for medical doctors, health officers, and nurses. Non-responses were excluded.

[3] Positive response is agreement with a positively framed statement or disagreement with a negatively framed statement.

Figure 8.8.1: Percent of respondents providing positive response to supportive supervisory statements, Ethiopia EmONC, 2016



To present an overall score, we calculated the percent of items with which the respondent provided a positive response (agreed with a positive statement or disagreed with a negative statement). The overall score for the supportive supervision statements was 70 out of a 100 and ranged from 72 for health officers and nurses to 70 for midwives. Variations across the different health cadres were not large.

8.9 Motivation factors

Like supervision, motivation was measured by a scale, this time with 10 items[46], all of which were phrased positively. Respondents answered with Likert-like responses of strongly disagree to strongly agree. Agreement is considered a positive response. Table 8.9.1 displays the percent agreement (agreed or strongly agreed) with each individual item as well as the overall score, by health worker category. Health workers appeared to be well motivated, with an overall score of 81 out of 100. Motivation was highest among medical doctors (98) and lowest among health officers (75).

[46] Cronbach's alpha was 0.84, also considered high.

Table 8.9.1: Percent agreement with individual items and overall motivation score, by health worker cadre, Ethiopia EmONC, 2016

	Total	Medical doctors	Health officers	Midwives	Nurses
	n=3,813	n=12	n=170	n=3,175	n=456
Percent agreement[1]					
I am punctual about coming to work.[2]	90%	91%	90%	90%	89%
I am a hard worker.	89%	100%	95%	89%	90%
I always complete my tasks efficiently and correctly.	86%	100%	91%	86%	86%
I am satisfied with the opportunity to use my abilities in my job.	86%	100%	84%	85%	88%
Overall, I am very satisfied with my job.	84%	100%	74%	85%	83%
These days, I feel motivated to work as hard as I can.	83%	100%	79%	83%	83%
I am satisfied that I accomplish something worthwhile in this job.	82%	100%	76%	82%	79%
I am proud to be working for this hospital/health centre/clinic.[2]	76%	100%	63%	75%	81%
This hospital/health centre/clinic really inspires me to do my very best on the job.[2]	69%	91%	53%	70%	70%
I am glad that I work for this facility rather than other facilities in the country.[2]	61%	100%	45%	61%	64%
Overall motivation score (out of 100)	81	98	75	81	82

Cronbach's alpha on included statements = 0.8366. All items included. See Table 8.8.2 for an explanation of Cronbach's alpha.

[1] Non-response varies across items. Maximum in any column is 3.5% missing unless otherwise noted. Non-responses are excluded.

[2] Non-response was 8.3% for medical doctors (1 missing). Non-responses are excluded.

In addition to the scale on motivation, five further questions were asked to better understand the factors impacting providers' motivation (Table 8.9.2). Providers rated each item from 1 (very low) to 5 (very high). Nearly 60 percent of health workers rated their working conditions as high or very high. Forty-one percent ranked as high the extent to which irregular electricity affected their work. But only 32 and 28 percent of health workers rated as high or very high the distribution of resources among their colleagues and the rewards they personally received at their facility, respectively.

Table 8.9.2: Percent of health workers with high/very high rating of items impacting motivation, received salary on time, and ever experienced sexual harassment in the facility,[1] by health worker cadre, Ethiopia EmONC, 2016

	Total	Medical doctors	Health officers	Midwives	Nurses
	n=3,813	n=12	n=170	n=3,175	n=456
Percent rating high or very high					
The conditions of their job	59%	73%	49%	60%	56%
The support received from their supervisor	46%	64%	32%	46%	48%
The extent to which irregularity in electricity affects their work	41%	27%	46%	40%	43%
The distribution of resources among fellow employees	32%	55%	21%	34%	27%
The rewards received from their organization	28%	27%	13%	29%	28%
Received their salary on time last month	75%	100%	64%	75%	75%
Ever experienced sexual harassment in this facility					
Male respondents[2]	7%	0%	2%	7%	8%
Female respondents[3]	12%	0%	10%	12%	7%

[1] Non-response varies across items. Maximum in any column is 5% missing, except for medical doctors which was 8.3% (1 missing), or unless otherwise noted. Non-responses are excluded.

[2] Non-response was 6% for male midwives and nurses. Non-responses are excluded.

[3] Non-response was 6% for female health officers and nurses. Non-responses are excluded.

Among all health providers, 75 percent reported that they had received their salary on time last month. The experience varied across the cadres and ranged from 100 percent for medical doctors to 64 percent among health officers.

Respondents were also asked whether they had ever experienced sexual harassment in their current workplace. Among male health workers, 7 percent had, and among female respondents 12 percent had. Medical doctors did not report any sexual harassment. Female midwives were the most likely to have experienced sexual harassment in the workplace (12 percent). It is interesting to note that the proportion of male and female nurses reporting sexual harassment was about the same. No questions were asked whether harassment had come from professional colleagues or from clients.

8.10 Suggestions for improvements

The questionnaire provided the health workers the opportunity to rank, from a predetermined list, the top three improvements that would increase their ability to provide quality services (Table 8.10.1). The reported priority (1st, 2nd or 3rd) is shown for each item, by cadre. Priority items were identified by the percent of respondents that indicated that item as a priority. In some cases, items received multiple priority levels, and in some cases, several items were ranked at the same priority level. All cadres ranked "More knowledge/updates/training" as their 1st priority improvement. Further, among nurses and midwives this improvement also ranked as their 2nd priority. "Better facility infrastructure (for client and/or staff comfort)"

was a 2nd or 3rd priority for all cadres. More incentives as in salaries, promotion or holidays was no group's first choice but did appear as a 2nd and 3rd priority for doctors, health officers, and nurses. Nurses and midwives' priorities were quite similar, though nurses indicated that more incentives would be highly prioritized whereas this did not appear as a priority for midwives, relative to the other items.

Of the ten items listed, 5 of them did not receive enough mention to reach a priority for the group. These were: more support from supervisor, more supplies or stock, better working hours, transportation for referral clients, and more autonomy or independence.

Table 8.10.1: Ranking of conditions that need improvement, by health worker cadre, Ethiopia EmONC, 2016

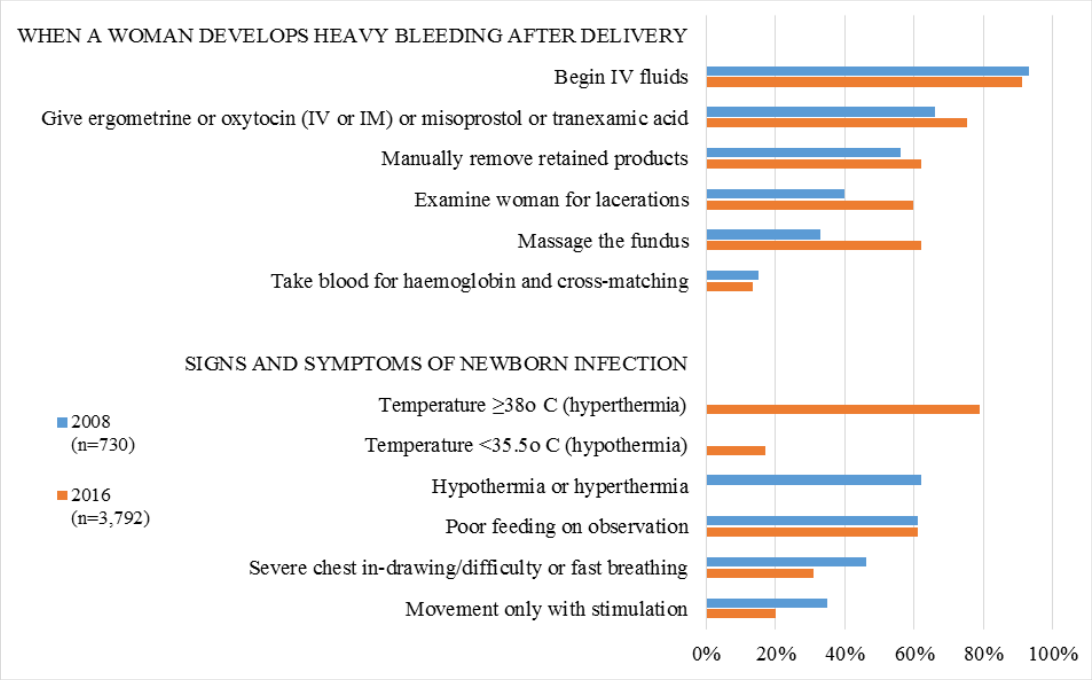
	Total	Medical doctors	Health officers	Midwives	Nurses
	n=3,813	n=12	n=170	n=3,175	n=456
What requires improvement (top 3)[1]					
More knowledge/updates/training	1, 2	1	1	1, 2	1, 2
Better facility infrastructure (for client and/or staff comfort)	3	2	3	3	3
Less workload (i.e. more staff)		2			
Better quality supplies/stock		2	2		
More incentives (salary, promotion, holidays)		3	2		2
More support from supervisor					
More supplies/stock					
Better working hours					
Transportation for referral clients					
More autonomy/independence					

[1] Health workers were asked to rank the top 3 improvements from the list above that would improve their ability to provide good quality services. 1 indicates the item ranked as the first top priority, 2 as the second top priority, and 3 as the third top priority. Ties were possible, which explains why 2 and 3 sometimes appear more than once.

8.11 Comparisons between 2008 and 2016

A similar knowledge questionnaire was administered during the 2008 EmONC assessment. However, the questions and responses changed in some cases. Figure 8.11.1 compares responses to two questions administered both years: symptoms of newborn infection and management of postpartum haemorrhage. Detailed comparisons by cadre can be found in the Appendix in Table 8.11.1A on page 377.

Figure 8.11.1: Percent of providers mentioning specific measures for treating heavy bleeding after delivery and signs of newborn infection in 2008 and 2016, Ethiopia EmONC, 2016



Since 2008, we mostly observed improvements in knowledge around PPH management. In 2016, a substantially higher percentage of providers mentioned massage the fundus, examine for lacerations, manually remove retained products, and give uterotonics as important steps to manage bleeding. In both years, very few providers (fewer than 20 percent) mentioned the need to take blood for haemoglobin and cross matching.

Regarding signs of newborn infections, providers in 2016 were more likely to mention hyperthermia than hypothermia. In 2008, the response combined hyperthermia with hypothermia, thus, we cannot make a direct comparison with 2008. No change in the percentage mentioning poor feeding was noticeable. However, the percentage of providers mentioning other signs (breathing difficulties and movement) decreased since 2008.

Chapter 9: Availability of Drugs, Equipment, and Supplies

Key Findings

- Almost all (99 percent) health facilities reported having a pharmacy or drug store at the time of the survey.
- Ninety-eight percent of health facilities with a pharmacy or supply of medicines reported that their primary source of medicine was government.
- Almost all (99 percent) health facilities had one or more antibiotic drugs related to signal functions.
- Overall, 98 percent of health facilities had one or more IV fluids.
- In general, 97 percent of health facilities had one or more contraceptive method. However, only 78 percent of them had emergency contraception.
- The most commonly available guidelines in the maternity area were for family planning (78 percent of health facilities), while only 52 percent of facilities had guidelines for obstetric topics or for infection prevention, and 48 percent for caring for preterm/low birth weight/KMC babies.
- The most widely available basic equipment in maternity area were stethoscope (for adult) (98 percent), blood pressure cuff (94 percent), foetal stethoscope (92 percent), and clinical thermometer (92 percent). Meanwhile, a functioning autoclave was only available in 51 percent of health facilities.
- Overall, 98 percent of health facilities had at least 1 complete delivery set. The mean number of available delivery sets was 5 per facility. However, only 63 percent of primary hospitals had an ultrasound, and 68 percent of all facilities had a Sims speculum.
- Among disinfectants and antiseptics, the most widely found were chlorhexidine solution (Savlon) (84 percent), povidone-iodine (78 percent), and alcohol-based rub (73 percent).
- Ferrous sulphate with folic acid was only available in 78 percent of health facilities; it is essential for all pregnant women.
- Seventeen percent of health facilities with a pharmacy or supply of medicines faced a stock out of oxytocin in the last 3 months, and one-quarter of those reported that the stock out was due to an interruption in the cold chain.

Drugs, medical supplies and equipment have a significant impact on the quality of client care. The concept of essential medicines was introduced by the World Health Organization (WHO) in 1977[47]. One third of the world's population lacks access to needed medicines. This lack of access is even worse among the world's poorest countries in Asia and Africa. In such countries, up to 50 percent of the total population lacks this access[48].

[47] World Health Organization. WHO Policy Perspectives on Medicines 5: Promoting rational use of medicines: core components. WHO/EDM/2002.3, Geneva, Switzerland: 2002. http://apps.who.int/iris/bitstream/10665/67438/1/WHO_EDM_2002.3.pdf, accessed 27 June 2017.

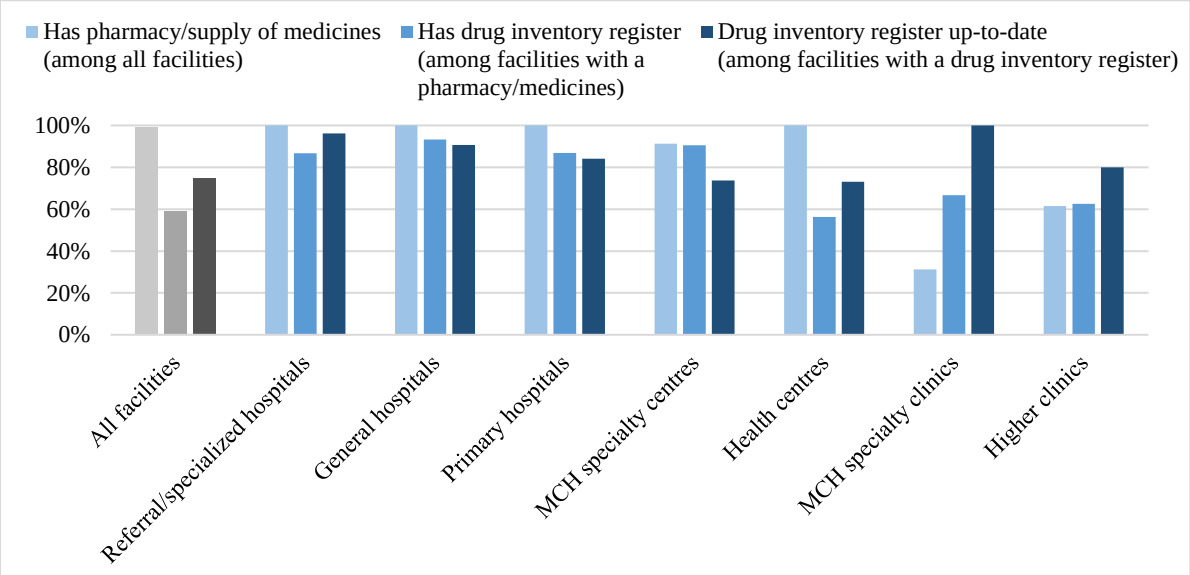
[48] Start D, Hovland I. Tools for Policy Impact: A Handbook for Researchers. Overseas Development Institute, London, 2004. http://web.worldbank.org/archive/website01031/WEB/IMAGES/TOOLS_HA.PDF, accessed 27 June 2017

This chapter reports on the availability of recommended drugs, equipment, and supplies required for the optimal delivery of EmONC services. Module 3 was used to assess the availability of these drugs, equipment, and supplies at health facilities in Ethiopia and to identify gaps.

9.1 Management and stock outs of drugs

Almost all assessed health facilities (99 percent) reported having a pharmacy or drug store at the time of the survey (Table 9.1.1A in the Appendix on page 378 and Figure 9.1.1). The availability of a pharmacy or drug store varied from 100 percent in hospitals to 31 percent in MCH speciality clinics. Among these facilities, only 59 percent of them had drug inventory registers; and among those facilities that had drug inventory registers, 75 percent were up-to-date. These up-to-date registers ranged from 73 percent in health centres to 100 percent in MCH specialty clinics.

Figure 9.1.1: Percent of facilities with a pharmacy or supply of medicines, with a drug inventory register, and whose register is up-to-date, by facility type, Ethiopia EmONC, 2016



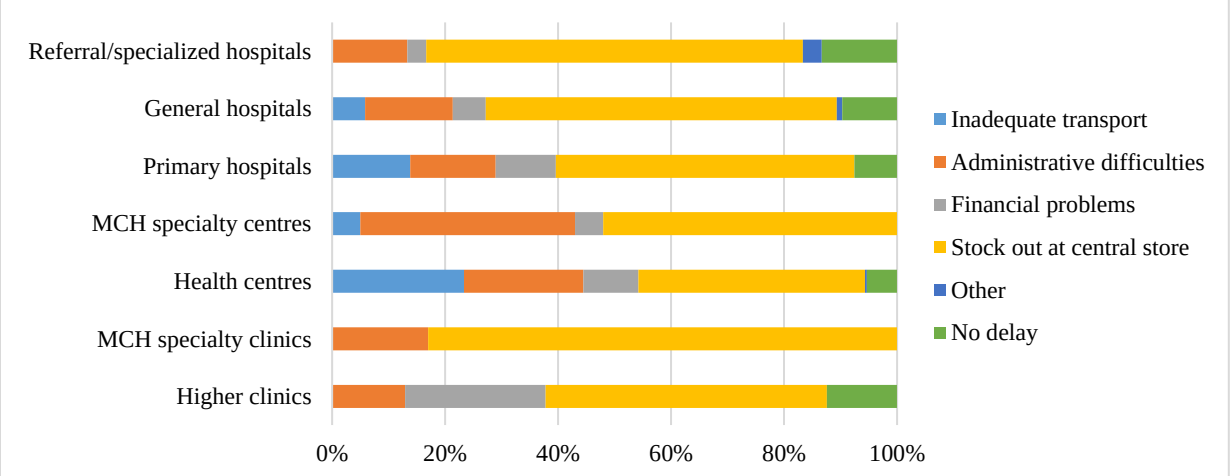
In general, 98 percent of health facilities reported that a government supplier was their primary source of medicine (Table 9.1.1A in the Appendix page 378). Looking at different facility types, the percentage varied from 97 percent in referral/specialized hospitals to 63 percent in higher clinics. Similarly, 97 percent of health facilities reported that a government supplier was their primary source for gloves, syringes and other medical supplies; and 2 percent of health facilities reported that a private pharmacy was their primary source of gloves, syringes and medical supplies. Government supplier and private pharmacy were reported equally as the primary source for gloves, syringes and other medical supplies to higher clinics (50 percent each), while other types of facilities cited government supplier more than private pharmacy.

Table 9.1.2 presents different mechanisms for ordering drugs by facility type. Among all facilities with a pharmacy, 67 percent ordered their drug supplies regularly on a weekly, monthly, or quarterly basis; and about 24 percent ordered every 6 or 12 months. In Figure 9.1.2 the most commonly reported causes of delay in the delivery of supplies or drugs as reported by staff in facilities with pharmacies or supplies of medicines were: stock out at central store (42 percent), inadequate transport (22 percent), and administrative difficulties (21 percent).

Table 9.1.2: Percent distribution of facilities with a pharmacy or supply of medicines according to schedule for ordering drugs, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,780	n=30	n=103	n=159	n=21	n=3,453	n=6	n=8
Drug supplies in the pharmacy are ordered								
Weekly/monthly/quarterly	67%	83%	79%	82%	48%	66%	50%	63%
Every 6 or 12 months	24%	0%	2%	5%	5%	26%	33%	0%
Whenever stock reaches reorder level	4%	10%	12%	6%	38%	4%	0%	13%
Whenever stock runs out	4%	3%	6%	6%	10%	3%	17%	25%
Never order drugs (sent through kits)	1%	0%	2%	1%	0%	1%	0%	0%
Other	0%	3%	0%	0%	0%	0%	0%	0%

Figure 9.1.2: Percent distribution of facilities with a pharmacy or supply of medicines according to reasons for delays refilling stock, by facility type, Ethiopia EmONC, 2016



Among health facilities with a pharmacy or a supply of medicines, 86 percent had accessible pharmacy/drug store 24 hours a day (Table 9.1.3). More than 80 percent of hospitals reported that their pharmacy was available 24 hours a day; while no only 71 percent and 23 percent of MCH specialty centres and higher clinics, respectively, reported that their pharmacy was available 24 hours a day. However, none of the MCH speciality clinics reported 24-hour availability of their pharmacy. Overall, 91 percent of health facilities reported that they regularly used a mechanism to ensure that expired drugs were not distributed. About 69

percent of health facilities had a 'first-in-first-out' system for supply management used for gentamicin and it was observed that in 84 percent of facilities, drugs were protected from moisture, heat or infestation. Also observed was the refrigeration of oxytocin and in 71 percent of facilities data collectors noted that oxytocin was refrigerated and there was evidence of monitoring. Among facilities storing required drugs in a functioning refrigerator, their power source was electricity or gas (59 percent) and 20 percent had a solar-powered refrigerator.

Table 9.1.3: Percent of facilities with a pharmacy or supply of medicines reporting on pharmacy/medicine-related items, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,780	n=30	n=103	n=159	n=21	n=3,453	n=6	n=8
Pharmacy present and accessible 24 hours a day	86%	97%	84%	95%	71%	86%	0%	23%
Pharmacy has adequate lighting to perform duties								
During the day	93%	100%	99%	100%	95%	93%	100%	100%
During the night (among facilities with 24 hour pharmacy service)	66%	100%	99%	90%	100%	63%	-	100%
Regularly used mechanism to ensure that expired drugs are not distributed	91%	100%	96%	97%	100%	90%	83%	88%
"First-in-first-out" system is in use for gentamicin (observation)	69%	73%	83%	87%	71%	68%	33%	100%
Drugs are protected from moisture, heat, or infestation (observation)	84%	97%	93%	96%	100%	83%	83%	88%
Oxytocin refrigerated and temperature monitored daily								
Yes, refrigerated and monitored	71%	80%	78%	75%	76%	70%	83%	63%
Yes, refrigerated but not monitored	20%	13%	15%	20%	14%	21%	0%	38%
No, oxytocin not refrigerated	3%	3%	2%	3%	0%	3%	0%	0%
No oxytocin in stock	5%	3%	6%	1%	10%	5%	17%	0%
Did not observe	1%	0%	0%	0%	0%	1%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Has functioning electric/gas refrigerator other than one for EPI	59%	90%	89%	81%	86%	56%	83%	63%
Has functioning solar refrigerator other than one for EPI	20%	13%	17%	11%	14%	21%	33%	25%

EPI = Expanded Programme on Immunization.

Figure 9.1.3 reports the stock out situation of specific drugs in the last three months prior to the date of facility visit: 57 percent, 53 percent, and 50 percent of health facilities faced stock outs in ketamine,

magnesium sulphate, and dexamethasone, respectively. Seventeen percent of health facilities faced an oxytocin stock out in the last three months; and those facilities when asked the reason for the stock out, about 25 percent reported interruptions in the cold chain (Table 9.1.4A in the Appendix, page 379).

Figure 9.1.3: Percent of facilities with a pharmacy or supply of medicines that reported a stock out of selected drugs in the last 3 months, Ethiopia EmONC, 2016

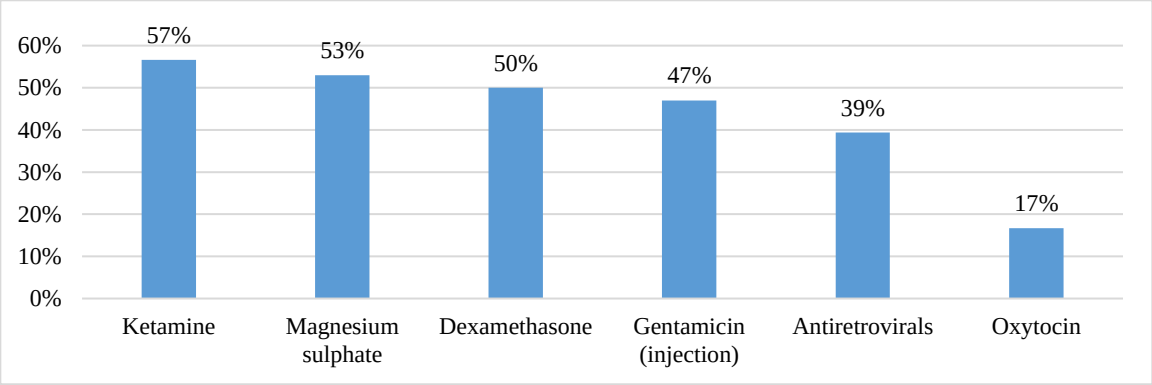


Table 9.1.5A in the Appendix (page 379) presents whether the facility has a safe supply of oxygen and experienced an interruption in the supply in the last 12 months in labour and delivery, on the neonatal ward, and paediatric ward. Among facilities with an oxygen supply available, about 35 percent reported an interruption in the safe oxygen supply in the last 12 months on these specific wards. MCH speciality clinics and higher clinics reported no interruption in the safe oxygen supply in the last 12 months prior to the survey. Among facilities that did report an interruption, 32 percent reported that the interruption was due to lack of electricity.

9.2 Essential drugs

The availability of essential drugs, equipment, and supplies plays a major role in delivering high-quality EmONC and other MNH related services.

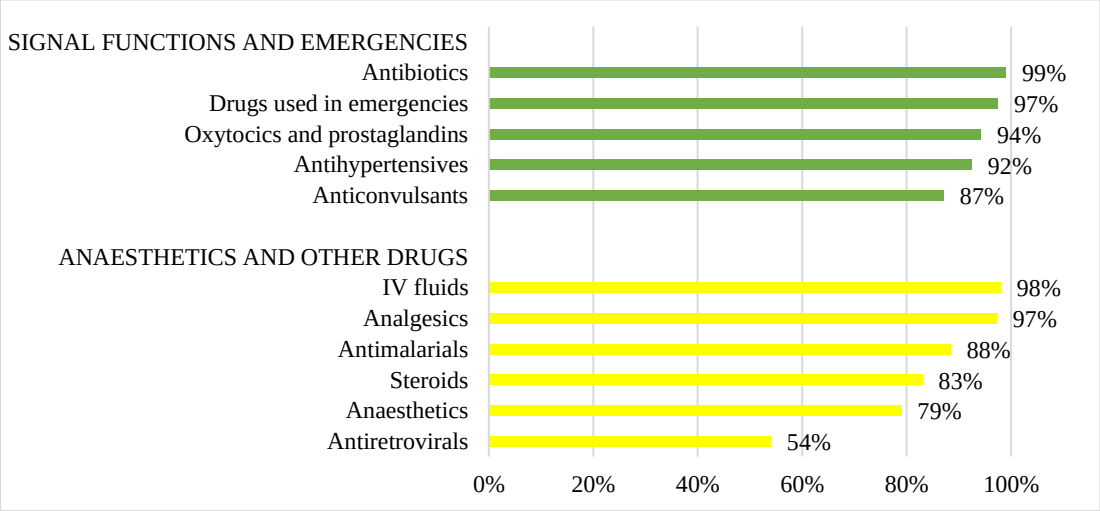
Almost all (99 percent) health facilities had one or more antibiotic related to the signal functions and emergencies (see Figure 9.2.1 and Table 9.2.1A in the Appendix, page 380). In hospitals, the availability of "any" antibiotic was 99 or 100 percent, while it was only 91 percent in MCH speciality centres. Oral amoxicillin (96 percent) was the most widely available antibiotic in all health facilities, followed by cloxacillin sodium (88 percent), and ceftriaxone (82 percent). However, the least available antibiotics in health facilities were amoxicillin (injection) (4 percent)[49], cefixime (6 percent), and cefotaxime injection (for newborns) (7 percent).

[49] Reportedly not registered or available in country.

Among all health facilities, about 87 percent had one or more anticonvulsant, which varied from almost 100 percent in hospitals to 25 percent in MCH speciality clinics. Diazepam (injection) (68 percent) was the most widely available drug in this grouping, followed by magnesium sulphate with 50% concentration (48 percent); however, magnesium sulphate with a concentration other than 50% (injection) (9 percent) was the least available anticonvulsant.

Ninety-two percent of health facilities had one or more antihypertensive. Methyldopa (74 percent) was the most widely available antihypertensive, while labetalol (3 percent) was the least available. Among all facilities, 94 percent had oxytocics and prostaglandins; however, only about 3 percent and 1 percent of health facilities had prostaglandin E2 (dinoprostone) and prostaglandin F2 alpha, respectively. Oxytocin was widely available in health facilities ranging from 95 percent in primary hospital to 31 percent in MCH speciality clinics. Among emergency drugs, adrenaline (epinephrine) (84 percent) was the most widely available, followed by frusemide (73 percent) and promethazine (68 percent); nitroglycerine (6 percent) and naloxone (2 percent) were the least available drugs.

Figure 9.2.1: Percent of facilities that had drugs related to the signal functions and emergencies, and anaesthetics and other drugs, Ethiopia EmONC, 2016



In general, 79 percent of health facilities had one or more anaesthetic drug (see Figure 9.2.1 and Table 9.2.2A in the Appendix, page 382). Lidocaine 2% or 1% (72 percent) was the most widely available anaesthetic, while enflurane (1 percent) was the least available drug. Among anaesthetics, except lignocaine or lidocaine 2% or 1%, almost all were less available in health centres, MCH speciality clinics, and higher clinics than other facility types. Overall, 97 percent of health facilities had one or more analgesic. The most widely available analgesics were: paracetamol tab (95 percent), diclofenac (93 percent), and paracetamol suppository (89 percent); morphine was the least available analgesic in health facilities. Eighty-three percent of health facilities had one or more steroids. Among the steroid group the most widely available in health facilities was dexamethasone (47 percent). None of the health centres reported having betamethasone, prednisone, or prednisolone corticosteroid drugs.

Overall, 98 percent of health facilities had one or more IV fluid. Normal saline (89 percent) was the most widely available IV fluid; glucose 10% was the least available IV fluid in health facilities. In general, 54 percent of health facilities had one or more antimalarial drug; however, none of the MCH speciality clinics had artemisium-based combination therapy (ACT) or quinine dihydrochloride drugs. Nationally, 54 percent of health facilities had antiretroviral drugs at the time of data collection.

Most facilities (97 percent) had one or more contraceptive method in stock (Table 9.2.3). However, only 3 percent of health facilities had female condoms and none of the MCH speciality clinics had female condoms. Among all health facilities, the availability of vitamin K and oral nystatin for newborns were 82 percent and 5 percent, respectively. Ferrous sulphate with folic acid was found in 78 percent of facilities, with MCH specialty clinics reporting only 25 percent.

Table 9.2.3: Percent of facilities that had contraceptives and other drugs[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Contraceptives (any)	97%	97%	97%	97%	91%	98%	31%	54%
Combined oral contraceptives	88%	90%	91%	91%	87%	88%	31%	54%
Progestin only pills	71%	93%	80%	68%	78%	71%	25%	31%
Implants	88%	90%	87%	89%	83%	89%	25%	46%
3-month injectables	91%	97%	84%	92%	91%	92%	31%	46%
IUDs	76%	97%	84%	83%	87%	75%	25%	23%
Male condoms	93%	97%	88%	92%	78%	94%	19%	38%
Female condoms	3%	3%	5%	3%	22%	3%	0%	8%
Emergency contraception	78%	93%	83%	88%	70%	78%	25%	46%
Other drugs and supplies								
Vitamin K (for newborn)	82%	100%	93%	91%	91%	81%	25%	46%
Nystatin (oral, for newborn)	5%	20%	22%	15%	9%	4%	6%	8%
Oral rehydration solution	83%	93%	97%	93%	87%	83%	25%	62%
Gentian violet paint	75%	87%	85%	79%	87%	75%	31%	54%
Ferrous sulphate or fumarate	55%	47%	69%	61%	52%	54%	13%	38%
Folic acid	41%	57%	65%	64%	61%	40%	13%	31%
Ferrous sulphate with folic acid	78%	80%	85%	85%	87%	78%	25%	62%
Heparin	5%	77%	63%	20%	22%	2%	0%	15%
Magnesium trisilicate	76%	90%	78%	82%	61%	76%	19%	31%
Polio 0	86%	90%	69%	75%	83%	87%	19%	23%
BCG vaccine	93%	97%	77%	81%	78%	95%	25%	38%
Anti-tetanus serum/TAT	58%	87%	80%	74%	65%	57%	6%	46%
Tetanus toxoid vaccine	89%	97%	79%	78%	78%	90%	25%	38%
Anti-rho (D) immune globulin	9%	77%	43%	24%	39%	7%	13%	8%
ITNs	37%	17%	21%	35%	4%	38%	0%	31%
Mebendazole	95%	93%	97%	98%	87%	95%	25%	62%
Metoclopramide	79%	100%	99%	96%	78%	78%	25%	62%

ITN = insecticide-treated bed net; IUD = intrauterine device; TAT = tetanus anti-toxin.

[1] If facility reported neither a pharmacy nor a supply of medicines, that facility was assumed not to have the drug. Missing information was also taken as not having the drug.

9.3 Infection prevention and autoclave room

Health care associated infections are preventable through implementation of best infection prevention and control practices. Such practices facilitate the delivery of high quality health care for clients and a safe working environment for our health care workers. Measuring the components of infection prevention is essential for assessing the implementation of the infection control programme in health care facilities.

Accordingly, Table 9.3.1 shows the percentage of facilities that had the indicated materials for infection prevention in the maternity area, by type of facility.

Eighty-six percent of facilities in Ethiopia had soap for hand washing, and this is further illustrated by type of facility: ranging from 100 percent in MCH speciality centres and higher clinics to 86 percent in in health centres. In addition, wearable equipment intended to protect health care professionals from exposure to infectious agents were identified. Hence, more than three-quarters of facilities assessed had disposable latex examination gloves, heavy duty gloves, masks, and non-sterile protective clothing; less available were elbow length gloves (39 percent) and eye shields (66 percent). Over all, the availability of decontamination containers, bleach or bleaching powder (chlorine), prepared disinfection solution, regular trash bins, and puncture proof sharps containers were documented in more than 80 percent of facilities; meanwhile less than 60 percent of facilities had a mayo stand/table (or equivalent to establish sterile field) or surgeon's boots. Moreover, a surgeon's hand brush with nylon bristles was available only in a quarter of all health facilities.

To prevent the transmission of microorganisms to and from personnel and clients and to minimize damage to medical equipment and devices from foreign material (e.g. blood, body fluids, etc.), disinfectants and antiseptics should be in place in all health care facilities. Among the disinfectants and antiseptics, the most widely encountered in health facilities were chlorhexidine solution (Savlon) (84 percent), povidone-iodine (78 percent), and alcohol-based rub (73 percent). Among disinfectants and antiseptics, chlorhexidine (4% gel) (15 percent), and ethanol 95% (15 percent) were the least available across all categories of health facilities.

Autoclave

The risk of transferring infection from instruments and equipment is dependent on the presence of micro-organisms, the type of procedure that is going to be performed, and the body site where the instrument and or equipment will be used. Therefore, to ensure the prevention of infection, reprocessing of instruments and equipment should be carried out in an effective way: cleaning instruments and equipment immediately after use to remove all organic matter and disinfection (by heat and water or chemical disinfectants) or sterilization are very important.

Table 9.3.1: Percent of facilities that had the indicated materials for infection prevention in the maternity area[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Basic items								
Soap	86%	97%	98%	93%	100%	86%	94%	100%
Antiseptics	93%	100%	99%	99%	96%	93%	100%	100%
Disposable latex examination gloves	97%	100%	100%	98%	100%	97%	100%	100%
Elbow length gloves	39%	67%	61%	55%	61%	37%	63%	54%
Heavy duty gloves	81%	97%	93%	94%	91%	80%	100%	92%
Eye shields	66%	100%	92%	87%	96%	64%	81%	92%
Mask	76%	97%	96%	96%	96%	74%	94%	92%
Non-sterile protective clothing	85%	100%	100%	96%	100%	84%	94%	100%
Decontamination container	95%	100%	100%	99%	100%	94%	100%	100%
Bleach or bleaching powder (chlorine)	84%	90%	94%	89%	100%	84%	94%	92%
Prepared disinfection solution	91%	100%	99%	98%	96%	90%	94%	100%
Regular trash bin	85%	97%	97%	96%	100%	84%	94%	92%
Covered contaminated waste trash bin	62%	93%	93%	74%	91%	60%	88%	54%
Puncture proof sharps container	96%	97%	98%	100%	100%	96%	94%	100%
Mayo stand/table (or equivalent to establish sterile field)	48%	90%	83%	67%	78%	46%	88%	69%
Surgeon's hand brush with nylon bristles	25%	67%	86%	56%	83%	21%	50%	31%
Surgeon's boots	58%	100%	94%	85%	96%	55%	81%	85%
Disinfectants and antiseptics								
Chlorhexidine (4% gel)[2]	15%	13%	35%	18%	26%	14%	13%	23%
Chlorhexidine solution (savalon)	84%	70%	91%	87%	91%	83%	81%	100%
Ethanol (75%)	44%	70%	68%	59%	78%	42%	75%	23%
Ethanol (95%)	15%	37%	28%	28%	52%	13%	38%	23%
Polyvidone iodine	78%	97%	96%	87%	96%	77%	100%	92%
Alcohol-based rub	73%	93%	95%	87%	74%	71%	88%	100%

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

[2] Differences in the percent of facilities with chlorhexidine (4% gel) between this table and Table 9.5.1A (on page 386 in the Appendix) may be due to different physical areas under scrutiny.

Table 9.3.2 presents the percentage of facilities with autoclave, sterilization and miscellaneous items in the maternity area, by type of facility. Nationally 48 percent of health facilities had separate equipment and space for an autoclave. Fifty-one percent had an autoclave with temperature and pressure gauges. Overall the availability of a steam sterilizer and sterilizer or pressure cooker (kerosene heated) were 39 percent and 45 percent, respectively; while a hot air sterilizer (dry oven), and steam instrument sterilizer or pressure cooker (electric) were available in fewer than a quarter of facilities. Moreover, the national availability of

two types of equipment – the sterilization drum and sterilization drum stand – were 84 percent and 66 percent, respectively. Among other miscellaneous items, a functioning incinerator and placenta pit were available in 82 percent and 92 percent of health facilities, respectively.

Availability of food provision services to clients varied from 8 percent in higher clinics to 90 percent in referral/specialized hospital. The availability of empty beds was 75 percent, 85 percent, and 74 percent for first stage (labour) beds, postnatal, and obstetric beds, respectively. Moreover, the availability of empty beds for the first stage (labour) and obstetrics was higher (above 80 percent) in most facilities, except for health centres (first stage labour beds 73 percent, and obstetrics 72 percent). The availability of empty postnatal beds ranged between 81 percent in MCH specialty clinics to 100 percent in MCH specialty centres.

Table 9.3.2: Percent of facilities with sterilization equipment and other miscellaneous items in the maternity area[1], by facility type, Ethiopia EmONC, 2016

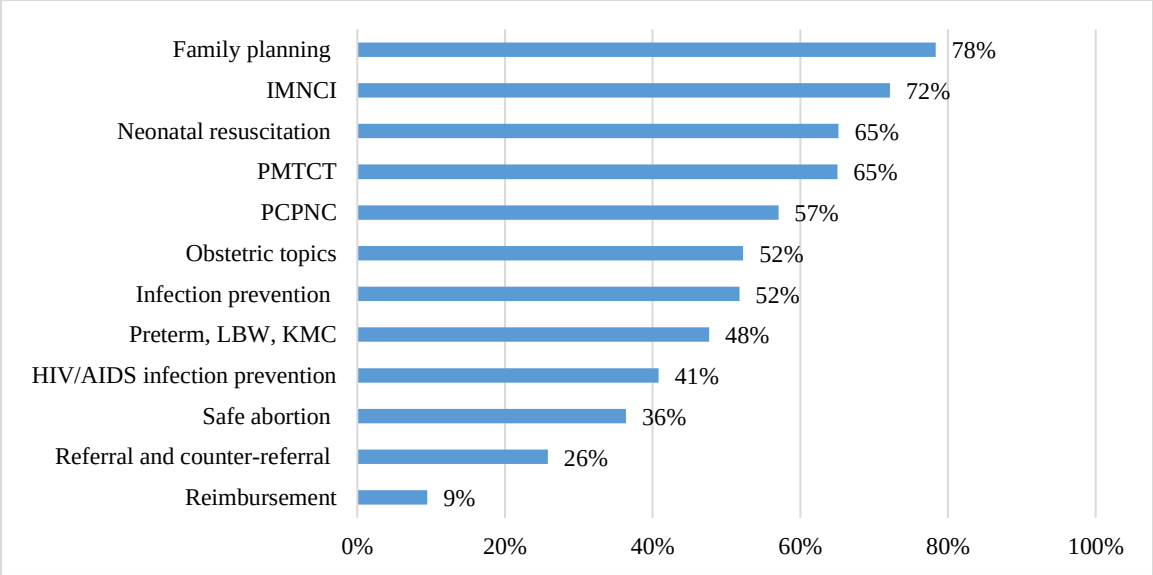
	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Physical space for autoclave (% distribution)								
Has separate equipment and space	48%	80%	73%	64%	83%	46%	69%	54%
Shares with other services	49%	17%	27%	35%	17%	51%	31%	46%
Other	3%	3%	0%	1%	0%	3%	0%	0%
Sterilization equipment								
Autoclave (with temperature and pressure gauges)	51%	80%	87%	77%	83%	48%	69%	77%
Hot air sterilizer (dry oven)	23%	53%	59%	45%	52%	21%	19%	31%
Steam sterilizer	39%	70%	69%	61%	65%	36%	63%	46%
Steam instrument sterilizer/pressure cooker (electric)	22%	40%	54%	49%	61%	20%	50%	38%
Sterilizer/pressure cooker (kerosene heated)	45%	17%	19%	18%	22%	47%	13%	15%
Sterilization drum	84%	93%	96%	94%	96%	83%	94%	85%
Sterilization drum stand	66%	90%	91%	83%	87%	64%	75%	77%
Miscellaneous items								
Functioning incinerator	82%	100%	99%	93%	87%	81%	88%	69%
Placenta pit	92%	100%	98%	98%	100%	91%	94%	85%
Food is provided to clients by facility	49%	90%	70%	43%	13%	49%	13%	8%
Empty bed available for:								
First stage (labour)	75%	83%	92%	94%	100%	73%	81%	92%
Postnatal	85%	87%	92%	96%	100%	84%	81%	85%
Obstetrics	74%	87%	93%	93%	87%	72%	81%	92%
Liquid spills or trash observed on floors	21%	23%	17%	18%	13%	21%	6%	15%

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

9.4 Guidelines, supplies, and medical equipment in labour and delivery and maternity wards

Figure 9.4.1 and Table 9.4.1A in the Appendix (page 383) show the availability of guidelines, supplies and medical equipment in labour and delivery and maternity wards. The most commonly available guidelines in all health facilities were family planning (78 percent), treatment for infection in young infants (IMNCI) (72 percent), neonatal resuscitation (65 percent), and PMTCT guidelines (65 percent). In general, health centres and higher clinics were less likely than other facility types to have the selected guidelines.

Figure 9.4.1: Percent of facilities that have the indicated guidelines in the maternity area, Ethiopia EmONC, 2016



The most widely available pieces of basic equipment in the maternity area were an adult stethoscope (98 percent), blood pressure cuff (94 percent), foetal stethoscope (92 percent), and clinical thermometer (92 percent); and the least available equipment were an external or internal CTG (cardiotocography) machine (3 percent) and ultrasound (8 percent) (Table 9.4.2A in the Appendix, page 384). Generally, the availability of supplies in the maternity area during the data collection time was good, except for obstetric wheels for measuring gestational age (22 percent), pulse oximeter (12 percent), and apnoea monitor (4 percent). Although 36 percent of facilities reported a filled cylinder of oxygen, with a cylinder carrier and valve key, only 15 percent reported tubing for oxygen administration.

Among the equipment used for assisted vaginal delivery the most widely available equipment was a vacuum extractor with different size cups (58 percent); hospitals and MCH speciality centres were more likely to have this equipment than other facility types (Table 9.4.3). Obstetric forceps were found in fewer than 1 in 4 facilities. Sponge (ring) forceps or uterine packing forceps (79 percent) and vaginal speculum (Sims) (68 percent) were the most widely available equipment in the maternity used for uterine evacuation. An electric vacuum aspiration machine was found in only 16 percent of facilities. Furthermore, 58 percent of facilities had a complete manual vacuum aspiration set and 56 percent vacuum aspirators and syringes.

Table 9.4.3: Percent of facilities with equipment for procedures in the maternity area[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Vacuum extraction/forceps delivery								
Vacuum extractor with different size cups	58%	93%	97%	89%	96%	55%	63%	77%
Obstetric forceps (outlet)	23%	97%	93%	86%	83%	16%	75%	69%
Obstetric forceps (low)	19%	90%	86%	73%	83%	13%	69%	62%
Obstetric forceps (breech)	13%	63%	64%	44%	52%	9%	44%	31%
Uterine evacuation								
Electric vacuum aspiration machine	16%	73%	76%	68%	78%	10%	69%	38%
Vaginal speculum (Sims)	68%	97%	98%	91%	83%	65%	94%	85%
Forceps (sponge [ring] or uterine packing)	79%	93%	98%	98%	96%	78%	88%	92%
Postpartum curette	22%	90%	89%	78%	78%	16%	75%	54%
Uterine dilators (French, sizes 13-27)	25%	80%	90%	78%	87%	19%	56%	77%
Uterine curettes (sharp, size 0 or 00)	15%	80%	82%	67%	83%	9%	56%	46%
Uterine curettes (blunt, size 0 or 00)	15%	80%	83%	66%	83%	10%	63%	46%
Uterine sound	52%	97%	93%	80%	100%	48%	81%	62%
Manual vacuum aspiration								
Complete manual vacuum aspiration set	58%	93%	95%	86%	100%	54%	81%	85%
Vacuum aspirators/syringes	56%	97%	91%	88%	100%	52%	81%	77%
Silicone lubricant (for lubricating O-ring)	40%	83%	84%	74%	91%	36%	75%	69%
Other oil (for lubricating O-ring)	18%	53%	47%	33%	52%	16%	44%	38%
Flexible cannulae (4-6mm)	52%	100%	87%	81%	96%	48%	69%	85%
Flexible cannulae (7-12mm)	50%	93%	89%	79%	87%	47%	69%	85%

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

Table 9.4.4 presents the availability of specific items for delivery sets, dressing instrument sets, and gynaecological and craniotomy equipment in the maternity area. Nationally, disposable short latex gloves (96 percent) and gauze swabs (97 percent) were the most widely available materials among supplies for delivery. Likewise, the availability of equipment under the category of dressing instrument set was high (above 80 percent) except for forceps (dissecting 1x2 teeth, 140mm) (68 percent), scissors (other types) (32 percent), and forceps (other types) (28 percent). Among the gynaecological equipment, the most widely available equipment was scissors (straight, sharp) 145 mm s/s (79 percent). Nationally, among the delivery sets, dressing instrument sets, and gynaecological, equipment, the craniotomy equipment was the least available. The availability of craniotomy equipment varied from 90 percent (perforator) in specialized hospitals to less than 2 percent in health centres.

Table 9.4.4: Percent of facilities with delivery sets, dressing instrument sets, and gynaecological and craniotomy equipment in the maternity area[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Supplies for delivery								
Disposable latex gloves (short)	96%	100%	100%	99%	100%	96%	100%	100%
Disposable latex gloves (long)	55%	80%	74%	63%	61%	53%	88%	69%
Plastic sheeting	76%	100%	98%	94%	100%	74%	94%	100%
Gauze swabs	97%	100%	100%	99%	100%	97%	100%	100%
Cloths or towels	33%	73%	74%	56%	78%	29%	81%	38%
Dressing instrument set								
Gallipot bowl or jar (s/s)	82%	93%	96%	91%	96%	81%	88%	92%
Needle holder (Mayo Hegar, 180mm, s/s)	89%	100%	100%	96%	100%	88%	94%	100%
Scissors (sharp straight, 120mm, s/s)	89%	100%	99%	95%	100%	89%	94%	100%
Scissors (flat curved, 180mm, s/s)	84%	93%	97%	94%	100%	83%	94%	100%
Scissors (other types)	32%	63%	52%	51%	48%	30%	63%	15%
Forceps (dissecting, Lane 1x2 teeth, 140mm)	68%	80%	91%	88%	100%	66%	88%	100%
Forceps (sponge [ring])	88%	97%	96%	96%	100%	87%	94%	100%
Forceps (artery, mosquito straight, 130mm, s/s)	84%	93%	100%	98%	100%	82%	88%	100%
Forceps (other types)	28%	60%	53%	45%	35%	26%	56%	8%
Gynaecological equipment								
Vaginal speculum (Sims)	68%	97%	98%	91%	83%	65%	94%	85%
Vaginal speculum (Cusco, virgin size 75x17mm)	47%	80%	86%	73%	74%	44%	75%	85%
Cusco speculum (Cusco, adult size)	71%	97%	98%	91%	91%	69%	88%	85%
Uterine sound (graduated, 305mm, s/s)	50%	97%	93%	76%	100%	47%	75%	77%
Tenaculum (single-tooth/multi-teeth)	69%	100%	100%	96%	100%	66%	88%	85%
Scissors (sharp straight, 145mm, s/s)	79%	100%	100%	97%	100%	77%	88%	100%
Craniotomy equipment								
Decapitation hook (s/s)	7%	83%	68%	49%	61%	2%	31%	31%
Craniotomy forceps (s/s)	7%	77%	73%	53%	61%	2%	25%	31%
Embryotomy scissors	7%	73%	65%	47%	61%	2%	25%	31%
Perforator	7%	90%	72%	52%	57%	2%	25%	23%

s/s = stainless steel.

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

Overall, 98 percent of health facilities had at least 1 complete delivery set (Table 9.4.5A in the Appendix, page 385). The mean number of delivery sets available was 5, which varied by facility type, ranging from 15 delivery sets in specialized hospitals to only 5 delivery sets in health centres and MCH speciality clinics. Nationally, the availability of at least one complete episiotomy / perineal set was 80 percent; however, only 12 percent of health facilities had at least one complete cervical exploration and repair set. The availability of a complete cervical exploration and repair set varied among facility types, ranging from 74 percent in general hospitals to only 7 percent in health centres.

Nationally, among the selected furnishings and amenities in the maternity area, the most widely available were beds and examination tables (both at 97 percent); the least available was a water filter or other means to make potable water available to clients and staff (12 percent) (Table 9.4.6).

Table 9.4.6: Percent of facilities with selected furnishings and amenities in the maternity area[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Furnishings and amenities								
Instrument trolley	79%	100%	98%	93%	100%	77%	94%	85%
Instrument tray	73%	93%	96%	87%	87%	72%	88%	92%
Beds	97%	100%	99%	100%	100%	96%	94%	100%
Linens	70%	93%	94%	90%	96%	68%	100%	85%
Blankets for cold weather	73%	97%	90%	90%	96%	72%	100%	77%
Water filter (or other means to make potable water available to clients/staff)	12%	40%	27%	16%	70%	10%	56%	23%
Wheelchair	68%	100%	98%	88%	96%	66%	75%	77%
Stretcher with trolley	64%	93%	97%	86%	91%	62%	69%	77%
Examination table	97%	97%	98%	99%	100%	96%	100%	85%
Labour/delivery table (with stirrups)	76%	93%	92%	90%	100%	75%	94%	77%
Labour/delivery table (without stirrups)	62%	80%	62%	56%	52%	62%	69%	31%

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

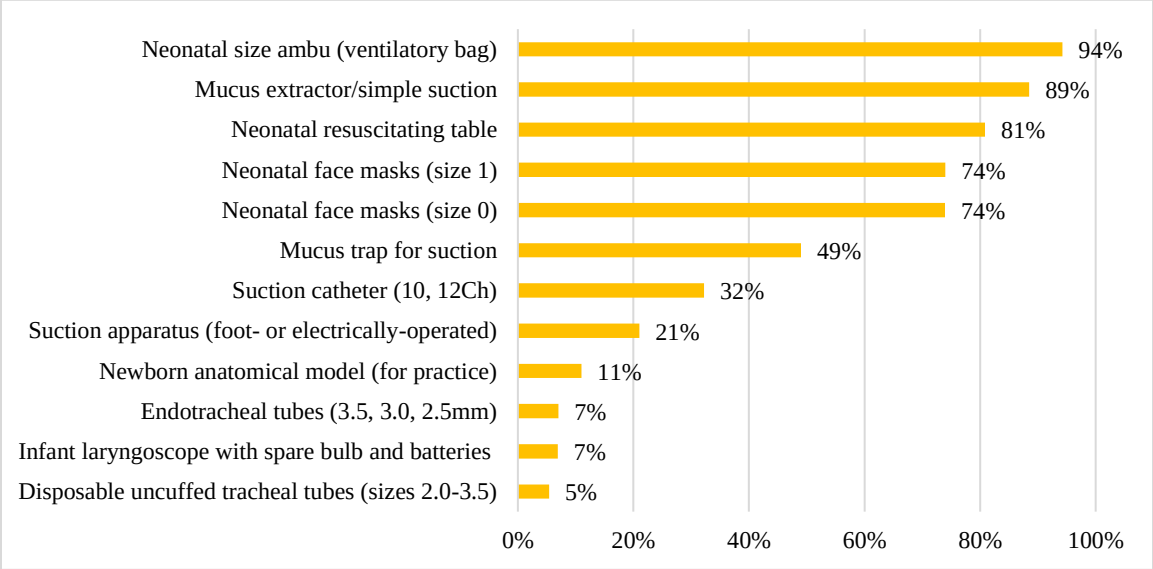
9.5 Newborn care equipment and supplies

All neonates whether they are born healthy, underweight or unwell require essential newborn care to minimize the risk of illness and maximize their growth and development. Appropriate emergency diagnostic or early therapeutic care and preventive interventions such as hygienic cord care, early and exclusive breastfeeding, and routine care greatly reduce neonatal morbidity and mortality. Therefore, along with the presence of health workers responsible for newborn care, the availability of basic equipment and supplies in health care facilities was assessed.

Generally, the availability of a baby weighing scale was 98 percent among all types of health facilities. In addition, cord ties existed in 95 percent of health facilities (Table 9.5.1A, page 386 in the Appendix). However, newborn thermometers were found in only 55 percent of facilities with wide variation across types of facilities. For instance, while a thermometer was reported in 90 percent of referral/specialized hospitals and MCH specialty centres, in health centres and MCH specialty clinics newborn thermometers were found in less than 57 percent. Similarly, only 23 percent of all facilities had caps or hats to prevent newborn heat loss, ranging between 21 percent in health centres to 61 percent in MCH specialty centres.

This survey revealed that the percentage of facilities with resuscitation equipment such as neonatal resuscitating tables, mucus extractors or simple suction, neonatal face masks (size 0 or size 1), and neonatal ambu (ventilator) bags were widely available in more than 70 percent of all facilities (Figure 9.5.1). Similarly, suction catheters 10, 12 ch were found in 32 percent of facilities with wide variation among types of facilities – as high as 96 percent in MCH specialty centres and as low as 28 percent in health centres. On the other hand, more sophisticated resuscitation equipment such as an infant laryngoscope with spare bulb and batteries, endotracheal tubes 3.5, 3.0, 2.5 mm, and disposable uncuffed tracheal tubes (sizes 2.0 to 3.5) were available in 5 to 7 percent of all facilities. Moreover, nationally the availability of equipment for resuscitation within the delivery unit was 90 percent. Similarly, the national availability of decontamination supplies for bag and mask was 88 percent.

Figure 9.5.1: Percent of facilities with selected items from neonatal resuscitation pack, Ethiopia EmONC, 2016



Most supplies and equipment utilized for small and sick newborns were not widely available; fewer than half of the facilities reported their availability. These included items such as a register for sick babies, IV fluid (neonatal giving) set, exchange transfusion set, umbilical catheter, radiant warmer, incubator, designated space or beds for kangaroo mother care, KMC registers, etc. The two exceptions were a daily client chart (53 percent) and syringes (0.5, 1.0 ml) (86 percent). Not surprisingly, these supplies and equipment were more available in referral/specialized hospitals compared to general and primary hospitals. Moreover, most of these items were more likely to be found in MCH specialty clinics compared to health centres.

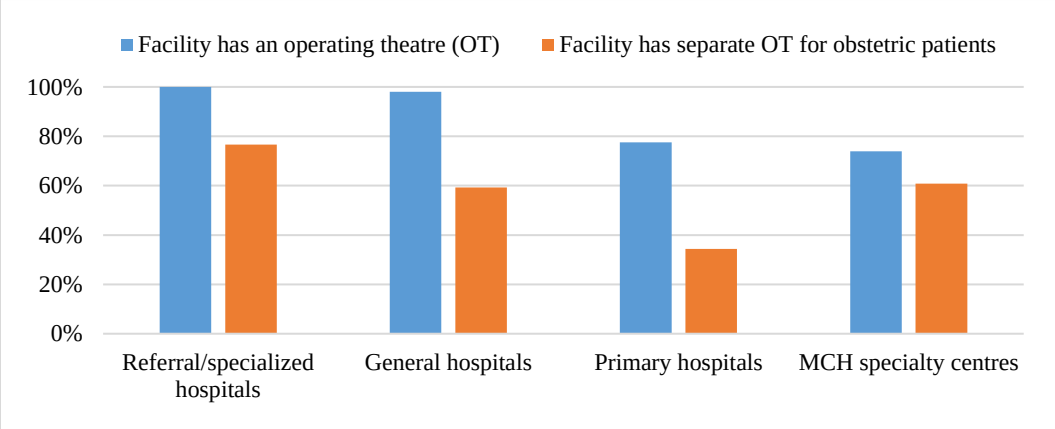
9.6 Operating theatre and equipment

Figure 9.6.1 and Table 9.6.1 show the availability of operating theatres (OT), selected equipment and supplies among all hospitals and MCH speciality centres.

Eighty-six percent of hospitals and MCH specialty centres had an OT (Figure 9.6.1). Although MCH speciality centres are expected to give full surgical service (e.g. caesarean section) only 74 percent had an OT. Similarly, among primary hospitals only about 78 percent had an OT.

Nationally, a separate OT for obstetric clients was found in 56 percent of this subset of facilities with at least one OT: 77 percent of specialized hospitals, 60 percent of general hospitals, 44 percent of primary hospitals, and 82 percent of MCH speciality centres.

Figure 9.6.1: Percent of hospitals and MCH specialty centres with an operating theatre for all clients and for obstetric clients, by facility type, Ethiopia EmONC, 2016



Among the facilities with an OT, 100 percent had an operating table and surgical drapes while 81 percent or more had the lighting and syringes considered basic OT equipment (Table 9.6.1).

Also, in Table 9.6.1 is a list of 24 items for obstetric laparotomy or caesarean section. Ninety percent or more of the health facilities had these items with two exceptions: the mini laparotomy kits (79 percent) and triangular point needles (86 percent).

Table 9.6.1: Percent of hospitals and MCH specialty centres with an operating theatre that have select equipment and supplies, by facility type, Ethiopia EmONC, 2016

	All hospitals/ MCH specialty centres n=272	Referral/ specialized hospitals n=30	General hospitals n=101	Primary hospitals n=124	MCH specialty centres n=17
Basic items					
Operating table	100%	100%	100%	100%	100%
Light (adjustable, shadowless)	94%	100%	97%	90%	100%
Surgical drapes	100%	100%	100%	100%	100%
Syringes (5ml)	99%	100%	98%	100%	100%
Syringes (10ml)	99%	100%	99%	98%	100%
Syringes (20ml)	81%	90%	89%	71%	88%
Needles (21, 22, 23)	84%	80%	90%	77%	100%
Adequate light to provide surgery during the day	97%	100%	98%	95%	100%
Adequate light to provide surgery at night	95%	97%	99%	91%	100%
Obstetric laparotomy/caesarean delivery pack					
Instrument tray with cover (stainless steel)	96%	97%	97%	94%	100%
Towel clips	99%	100%	100%	98%	100%
Forceps (sponge, 22.5cm)	99%	100%	99%	99%	100%
Forceps (straight artery, 16cm)	100%	100%	99%	100%	100%
Forceps (uterine haemostasis, 20cm)	90%	97%	91%	87%	94%
Needle holder	100%	100%	100%	99%	100%
Surgical knife handle (#3)	97%	97%	99%	94%	100%
Surgical knife handle (#4)	99%	100%	99%	98%	100%
Surgical knife blades	99%	100%	100%	98%	100%
Needles (triangular point suture, 7.3cm, size 6)	86%	83%	87%	85%	94%
Needles (round-bodied, #12, size 6)	92%	93%	96%	88%	100%
Abdominal retractor (size 3)	97%	100%	97%	98%	88%
Abdominal retractor (double-ended, Richardson)	92%	97%	93%	90%	100%
Scissors (curved operating, blunt pointed, Mayo, 17cm)	99%	100%	98%	98%	100%
Scissors (straight operating, blunt pointed, Mayo, 17cm)	98%	100%	97%	98%	100%
Scissors (straight, 23cm)	98%	97%	98%	98%	100%
Suction nozzle	94%	97%	96%	91%	100%
Suction tube (22.5cm, 23 French gauge)	97%	97%	97%	96%	100%
Intestinal clamps (curved, 22.5cm)	94%	97%	96%	94%	88%
Intestinal clamps (straight, 22.5cm)	94%	97%	97%	90%	94%
Dressing (non-toothed tissue) forceps (15cm)	99%	97%	99%	98%	100%
Dressing (non-toothed tissue) forceps (25cm)	98%	97%	100%	98%	94%
Sutures (different sizes and types)	99%	97%	99%	100%	100%
Mini-laparotomy kit (for female sterilization)	79%	87%	84%	70%	94%

OT = operating theatre.

Table 9.6.2 examines the availability of anaesthesia equipment. Only 71 percent of the OTs had a suction aspirator that was pedal operated. However, data collectors noted high availability of endotracheal tubes with 8 mm cuff (95 percent), endotracheal tubes with 10 mm cuff (89 percent), and endotracheal tubes with 2.5 – 3.5 mm cuff (89 percent).

Table 9.6.2: Percent of hospitals and MCH specialty centres with an operating theatre that have anaesthesia equipment and supplies, by facility type, Ethiopia EmONC, 2016

	All hospitals/ MCH specialty centres	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres
	n=272	n=30	n=101	n=124	n=17
Anaesthesia equipment and supplies					
Anaesthetic face masks	99%	100%	98%	98%	100%
Oropharyngeal airways	98%	100%	100%	96%	100%
Laryngoscopes (with spare bulbs and batteries)	96%	100%	95%	95%	94%
Endotracheal tubes with cuffs (8mm)	95%	100%	98%	92%	94%
Endotracheal tubes with cuffs (10mm)	89%	90%	93%	85%	94%
Endotracheal tubes with cuffs (2.5-3.5mm)	89%	90%	93%	85%	88%
Intubating forceps	79%	87%	83%	71%	94%
Endotracheal tube connectors (15mm plastic, connect directly to breathing valve, three for each tube size)	90%	97%	88%	89%	94%
Spinal needles (18-25 gauge)	93%	90%	93%	92%	100%
Suction aspirator (foot-operated)	71%	70%	75%	66%	76%
Suction aspirator (electric)	96%	100%	95%	95%	100%
Anaesthetic vaporizers (draw-over system)	87%	97%	88%	82%	94%
Oxygen cylinders with manometer and flowmeter (low flow) tubes and connectors	98%	100%	98%	97%	100%

9.7 Laboratory equipment and supplies for blood transfusion

Table 9.7.1 presents the availability of equipment and supplies for laboratory and blood transfusion. Eighty percent of all facilities had laboratories but only 78 percent of the health centres had a laboratory on the premises. Among the facilities with a laboratory, 65 percent had operating guidelines. Blood bank refrigerators were found in only 11 percent of the facilities, concentrated in the hospitals and MCH specialty centres; however, only 57 percent of primary hospitals had a blood bank refrigerator. Only 4 percent of health centres, 13 percent of MCH specialty clinics, and 31 percent of higher clinics had a blood bank refrigerator. Higher clinics and health centres are not expected to provide blood transfusion services.

Table 9.7.1 also shows specific equipment and supplies for laboratory and blood transfusion among those facilities with a laboratory; less than 10 percent of health facilities had 20% bovine albumin, a 37^0 water bath (or incubator), and bags for blood collection. Among the blood collection and screening tests, Tb microscopy was available in 87 percent of facilities, pregnancy tests in 81 percent of the facilities, and hepatitis B, hepatitis C, and syphilis tests were available in 45 percent, 19 percent, and 64 percent of health facilities, respectively. Only 176 health facilities had units of blood in stock, most of which were hospitals; no higher clinic had blood in stock, 5 health centres and 2 MCH specialty clinics had blood available. The referral/specialized hospitals had on average 63 units of blood while MCH specialty centres and clinics, and health centres had between 4 and 6 units.

Table 9.7.1: Percent of facilities with a laboratory, and among those, percent with guidelines and equipment and supplies for blood collection, screening, and transfusion, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Facility has a laboratory	80%	100%	100%	99%	100%	78%	100%	100%
Number of facilities with a laboratory	n=3,038	n=30	n=103	n=158	n=23	n=2,695	n=16	n=13
Facility has set of guidelines for laboratory	65%	100%	94%	83%	74%	62%	81%	69%
Equipment and supplies for donor blood transfusion								
Refrigerator for blood bank	11%	97%	82%	57%	70%	4%	13%	31%
Test tubes (various sizes)	69%	100%	95%	82%	100%	66%	94%	92%
Microscope slides	88%	100%	99%	97%	100%	86%	94%	92%
Compound microscope for cross-matching	34%	83%	76%	63%	74%	29%	50%	54%
Microscope illuminator	40%	70%	59%	54%	52%	38%	63%	54%
Blood lancets	86%	97%	97%	92%	100%	85%	94%	85%
Cotton wool	89%	100%	99%	96%	100%	88%	94%	85%
Rack	80%	100%	98%	94%	100%	77%	94%	92%
Sodium chloride solution (8.5g/l)	55%	93%	87%	71%	78%	52%	69%	77%
Bovine albumin (20%)	6%	20%	25%	13%	26%	5%	25%	15%
Centrifuge (electric)	74%	100%	97%	93%	100%	71%	81%	85%
Centrifuge (hand driven)	41%	20%	27%	32%	13%	43%	38%	23%
37º water bath (or incubator)	10%	77%	47%	23%	57%	6%	38%	38%
Pipettes (volumetric, various sizes)	56%	97%	93%	86%	96%	52%	81%	77%
Blood typing and cross-matching reagents	57%	100%	98%	86%	96%	53%	75%	85%
Bags for collecting blood	5%	40%	39%	18%	35%	2%	19%	8%
Blood collection equipment								
Airway needle for collecting blood	13%	67%	65%	36%	48%	9%	25%	23%
Artery forceps	28%	57%	53%	38%	48%	26%	50%	54%
Anticoagulant bottles	29%	70%	76%	54%	78%	25%	63%	54%
Scale for blood collection	11%	37%	44%	22%	43%	8%	19%	31%
Blood screening equipment and supplies								
Hepatitis B test	45%	100%	97%	87%	96%	39%	81%	85%
Hepatitis C test	19%	87%	85%	66%	87%	11%	63%	85%
HIV RDT kit	69%	90%	82%	74%	74%	68%	63%	77%
Syphilis test	64%	97%	91%	86%	96%	61%	88%	92%
TB microscopy (slides, stain)	87%	100%	95%	90%	74%	86%	81%	85%
Malaria RDT kit	55%	27%	30%	27%	52%	58%	31%	62%
Pregnancy test	81%	97%	91%	92%	96%	80%	88%	100%
Number of facilities with a stock of blood	n=176	n=27	n=65	n=63	n=14	n=5	n=2	n=0
Average number of units of blood in stock	39	63	43	35	4	6	6	0

RDT = rapid diagnostic test.

Table 9.7.2 shows laboratory supplies that were available at the time of data collection. Most were available with the exceptions of CD4 counting machines, May Grunwald stain, and ammonia, which were available in 8 percent, 4 percent, and 5 percent of the health facilities, respectively.

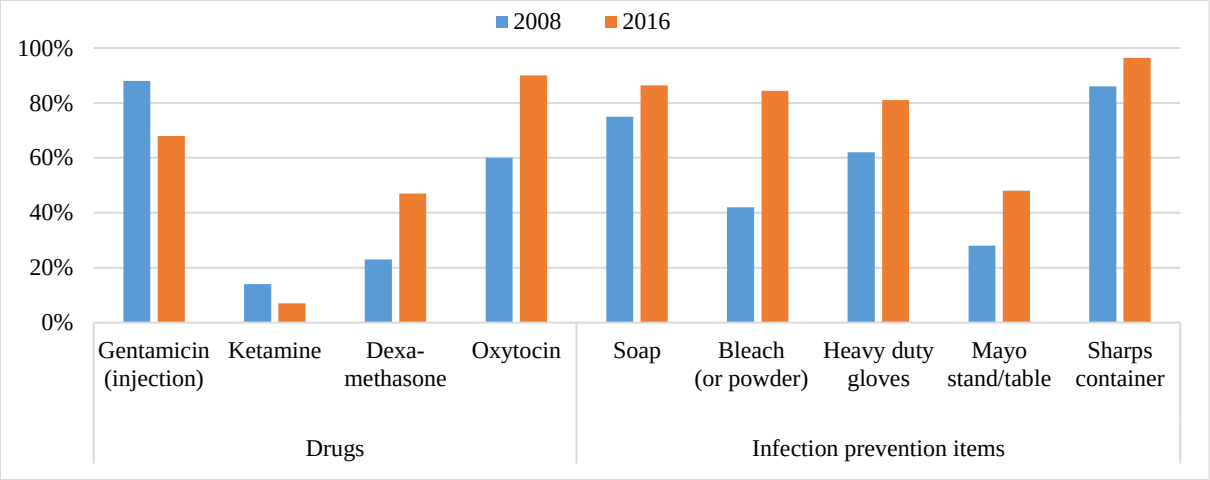
Table 9.7.2: Percent of facilities with a laboratory that have basic laboratory supplies, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,038	n=30	n=103	n=158	n=23	n=2,695	n=16	n=13
Basic laboratory supplies								
Microscope	99%	100%	100%	100%	100%	99%	100%	100%
Immersion oil	94%	100%	99%	99%	96%	94%	81%	92%
Glass rods	45%	73%	77%	60%	61%	43%	44%	77%
Sink or staining tank	85%	100%	97%	92%	100%	84%	94%	92%
Measuring cylinder (various sizes)	73%	100%	92%	87%	78%	71%	63%	77%
Wash bottle	52%	97%	83%	69%	83%	49%	63%	77%
Bottle with buffered water	24%	63%	59%	38%	78%	21%	25%	23%
Timer clock with alarm	80%	90%	88%	88%	96%	79%	94%	69%
Rack for drying slides	78%	100%	96%	91%	91%	76%	100%	92%
Giemsa stain	84%	93%	97%	93%	96%	83%	88%	85%
Wright stain	34%	83%	80%	54%	78%	30%	69%	85%
May Grunwald stain	4%	27%	15%	10%	22%	3%	13%	0%
Funnel and filter paper	66%	97%	86%	79%	61%	64%	44%	69%
Methanol	73%	93%	95%	90%	100%	70%	81%	77%
Refrigerator for laboratory supplies	64%	100%	97%	92%	100%	60%	94%	85%
Glass containers	45%	93%	86%	62%	83%	41%	63%	62%
Counting chamber (differential counter)	52%	100%	85%	68%	83%	49%	75%	100%
Pipette (5ml)	47%	93%	83%	65%	74%	44%	75%	77%
Pipette (graduated, 1ml)	40%	93%	76%	65%	74%	36%	75%	77%
Pipette (dropping)	66%	93%	89%	85%	96%	64%	81%	92%
Cover slips	92%	100%	98%	97%	96%	92%	100%	92%
Petri dishes	36%	93%	67%	51%	35%	33%	44%	54%
Bowls, kidney dishes (various sizes)	63%	80%	79%	68%	57%	61%	50%	69%
Turk diluting solution	20%	77%	50%	33%	35%	18%	25%	31%
Tally counter	44%	87%	78%	64%	87%	41%	63%	46%
Haemoglobinometer and hydrochloric acid solution	44%	63%	62%	47%	78%	42%	88%	69%
Spectrophotometer	11%	80%	53%	28%	78%	6%	31%	54%
Microhaematocrit centrifuge (manual or electric)	47%	83%	85%	85%	100%	43%	63%	38%
Balance for reading results	32%	83%	73%	61%	83%	27%	50%	46%
Heparinized capillary tubes (75x1.5mm)	56%	90%	87%	81%	83%	52%	69%	69%
Spirit lamp	68%	93%	87%	78%	70%	66%	88%	92%
Ethanol	55%	97%	91%	75%	91%	51%	81%	62%
Test tubes	90%	100%	98%	93%	100%	90%	100%	100%
Test tube rack	88%	100%	99%	95%	100%	87%	100%	100%
Beaker (various sizes)	41%	97%	79%	66%	61%	37%	56%	69%
Ammonia	5%	20%	15%	7%	9%	4%	13%	0%
Lugol's iodine solution	32%	87%	82%	55%	70%	27%	88%	77%
CD4 machine	8%	97%	65%	35%	17%	4%	0%	8%

9.8 Comparisons between 2008 and 2016

Figure 9.8.1 presents the comparison between the 2008 and 2016 percent of facilities with tracer drugs, and injection prevention items, supplies, and equipment. Among the category of specific drugs, the availability of ketamine decreased by half from 2008 (14 percent) to 2016 (7 percent). However, the availability of oxytocin increased from 60 percent in 2008 to 90 percent in 2016. Among infection prevention items, increased availability was observed across all items from 2008 to 2016.

Figure 9.8.1: Percent of facilities with selected drugs and infection prevention items available in 2008 and 2016, Ethiopia EmONC, 2016



In the category of the availability of at least one drug across the larger drug groupings, improvements were observed among anticonvulsants (54 percent to 87 percent), antihypertensives (78 percent to 92 percent), oxytocics and prostaglandins (84 percent to 94 percent), anaesthetics (74 percent to 79 percent), and steroids (53 percent to 83 percent); however, the availability of an antimalarial or of an antiretroviral decreased from 92 percent to 88 percent, and 92 percent to 54 percent, respectively (Table 9.8.1).

Among the category of functioning equipment, improvement was observed in the availability of a neonatal ventilatory bag (40 percent to 94 percent), an autoclave with temperature and pressure gauges (46 percent to 51 percent), and a functioning incinerator (71 percent to 82 percent); however, the availability of at least one complete cervical exploration and repair set decreased from 30 percent to 12 percent.

The availability of a pharmacy or drug store did not change over time, nor did the availability of an OT among hospitals or MCH specialty centres.

Table 9.8.1: Percent of facilities with tracer items for drugs, supplies, and equipment in 2008 and 2016, Ethiopia EmONC, 2016

	2008	2016
Availability of any drugs in the category		
Antibiotics (any)	99%	100%
Anticonvulsants (any)	54%	87%
Antihypertensives (any)	78%	92%
Oxytocics and prostaglandins (any)	84%	94%
Anaesthetics (any)	74%	79%
Steroids (any)	53%	83%
IV fluids (any)	97%	98%
Antimalarials (any)	92%	88%
Antiretrovirals (any)	92%	54%
Contraceptives (any)	99%	97%
Availability of functioning equipment		
Blood pressure cuff	94%	94%
Neonatal ventilatory bag	40%	94%
Autoclave (with temperature and pressure gauges)	46%	51%
Functioning incinerator	71%	82%
Facility has at least one complete delivery set/pack	96%	98%
Facility has at least one complete cervical exploration and repair set	30%	12%
Miscellaneous		
Facility has pharmacy/drug store	99%	99%
Hospital or MCH specialty centre has an operating theatre	88%	86%

Chapter 10: Case Reviews

Key Findings

- Although use of the partograph increased substantially since 2008 and more partographs show the initial cervical dilation charted correctly on the alert line, use is suboptimal. For example, more than half (55 percent) of women who received augmentation did not have the timing or the dosage of administration recorded on the partograph, demonstrating a lack of understanding of the importance of monitoring this intervention relative to the action and alert lines. Further training on the use of the partograph is needed.
- Documented evidence of the use of prophylactic uterotonics was available for only half of the women whose caesarean was reviewed whereas all women should receive them and their use recorded.
- Maternal death reviews suffered from poor record-keeping. Many variables of interest – cause of death being primary – were unavailable in the registers, client charts and audit files, or the files themselves were not accessible. Missing information was less of a problem when women died in hospital compared to health centres.
- The reviews of the three maternal morbidities indicate a need for better recording and early monitoring of vital signs (temperature, pulse, blood pressure), measurement of fluid input and output, and use of diagnostics to test for protein in urine to improve diagnosis and provide prompt early treatment.
- A large number of newborn cases with breathing difficulties had a normal weight and were at term and had unacceptably high mortality. This implies deficient immediate neonatal care and training of care providers in neonatal resuscitation is indicated.

10.1 Partograph reviews

The purpose of the partograph review was to assess the use and quality of the partograph completion and to the extent possible labour management in the health facilities. According to the instructions to the data collection teams, if a facility used any partograph in the 12 months preceding the survey, the team would select two recent partographs for review. Although the data collectors were instructed to complete two partograph reviews from each eligible facility for EmONC assessment, two were not always completed.

The instructions for the partograph review were to choose partographs completed by different providers (if possible). Additional selection criteria included that the deliveries took place at the facility, the pregnancies were at term, < 8 cm dilatation, vertex presentation, foetal heart beat present at first exam, and without obstetric complications.

Use and availability of the partograph

Among the 3,804 health facilities with delivery services that were assessed in this survey, a partograph review was conducted in 2,707 (71 percent). From these facilities, a total of 5,252 partographs were reviewed (Table 10.1.1A in the Appendix, page 387). The partograph was used in 2,829 (74 percent) of all health facilities and among these facilities where partographs were used, the modified WHO partograph was used in 2,443 (86 percent) of the facilities. The private-for-profit facilities reported low usage of the partograph at 40 percent (Table 10.1.2).

A labour management protocol is important as it guides the use of the partograph during labour and delivery and alerts the provider if, and when, other interventions are needed. This labour management protocol was only available and observed by the data collector in 48 percent of the facilities. Half of facilities used the ANC card with the partograph to record women's information, and 42 percent of facilities used a clinical/case file. Facilities were able to indicate more than one document; thus, some facilities likely used both the ANC and the clinical/case file. Staff in 69 percent of the facilities reported that they preferred to use the partograph chart in the ANC card.

Table 10.1.2: Percent of facilities according to partograph usage characteristics, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	All facilities	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
Among all facilities	n=3,804	n=316	n=3,488	n=3,662	n=83	n=59
Uses partographs[3]	74%	83%	74%	75%	40%	81%
Among facilities that use partographs	n=2,829	n=260	n=2,569	n=2,749	n=33	n=47
Type of partograph (multiple responses possible)						
Modified WHO partograph	86%	90%	86%	87%	70%	83%
Simplified WHO partograph	1%	2%	1%	1%	9%	0%
Composite WHO partograph	2%	2%	2%	2%	3%	2%
Other types of partograph	0%	1%	0%	0%	9%	0%
Labour management protocol						
No management protocol	43%	32%	44%	43%	36%	38%
Protocol exists and was observed by the data collector	48%	58%	48%	49%	48%	47%
Protocol exists but was not observed by the data collector	8%	10%	8%	8%	15%	15%
Facility has other document to fill in for women in labour (multiple responses possible)						
ANC card (includes partograph)	50%	55%	50%	50%	61%	60%
Clinical/case file	42%	61%	40%	42%	58%	38%
Administrative/financial file	6%	16%	5%	6%	33%	6%
When prioritized, with which document do you start?						
ANC card (includes partograph)	69%	54%	71%	69%	64%	84%
Clinical/case file	31%	45%	29%	31%	36%	16%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Non-response varies across stratifying variables and is less than 2.0%. Non-responses are excluded.

Partograph recording practices

Cervical dilation was correctly charted in more than 90 percent of the partographs except those from private-for-profit and private-not-for-profit facilities, where it was lower at 78 and 88 percent, respectively (Table 10.1.3). Expectedly, among those correctly charted, the distribution of the timing of delivery was on or left of alert line (77 percent), between alert and action line (15 percent), and on or to the right of the action line (2 percent). In private-for-profit facilities, however, the partographs indicated that deliveries beyond the action line (12 percent) were greater than deliveries occurring between the alert and action lines (5 percent).

It is standard obstetric practice to take action within 30 minutes after the decision for intervention, including those interventions indicated for prolonged labour (that cross the action line on the partograph). Among the 101 women who delivered beyond the action line, the average time between the action line and delivery was 4.1 hours (Table 10.1.3) and the median was 3 hours. This shows the quality of birth attendance was suboptimal and could put mothers and their babies at an increased risk of complications.

Overall 4 percent of the partographs recorded augmentation of labour. This percentage was more than double in hospitals or MCH speciality centres (11 percent), and more than five-fold (22 percent) in private-for-profit facilitiies. Although augmentation is not recommended in non-CEmONC facilities, 4 percent of partographs from health centres/clinics documented augmentation.

Poor practice in documentation of augmentation on partographs was observed. Among those partographs where augmentation was used, 55 percent did not record this on the partograph. In addition, in 42 percent of partographs augmentation was started unnecessarily before the action line was reached (in private facilities this was even higher, between 44 and 66 percent). Furthermore, 17 percent of partographs were assessed as having been filled in after delivery.

Table 10.1.3: Percent of partographs reviewed according to charting and recording practices,[1] by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority[2]		
	All partographs reviewed	Hospitals/ MCH specialty centres	Health centres/ clinics[3]	Public/ government	Private-for-profit	Private-not-for-profit[4]
Among all partographs reviewed	n=5,252	n=500	n=4,752	n=5,109	n=54	n=89
First dilatation charted correctly on alert line	92%	93%	92%	92%	78%	88%
Among partographs with first dilatation charted correctly on alert line	n=4,838	n=466	n=4,372	n=4,718	n=42	n=78
Time at delivery filled in	85%	90%	85%	85%	95%	76%
Apgar score recorded	78%	89%	77%	78%	78%	79%
Partograph filled in: (subjective according to data collector)						
As labour progressed	83%	88%	83%	83%	88%	79%
After delivery	17%	11%	17%	17%	12%	21%
The woman delivered:						
On or left of alert line	77%	67%	78%	77%	61%	77%
Between alert and action lines	15%	16%	15%	15%	5%	12%
On or right of action line	2%	6%	2%	2%	12%	3%
No information	6%	11%	6%	6%	22%	9%
Labour was augmented	4%	11%	4%	4%	22%	4%
Among those delivering on or to the right of the action line	n=101	n=27	n=74	n=94	n=5	n=2
Average time until delivery after reaching action line (hours) [5]						
Mean	4.1	2.9	4.6	4.2	[2.6]	[1.5]
Median	3.0	2.0	3.0	3.0	[2.0]	[1.5]
Among those augmented	n=215	n=52	n=163	n=203	n=9	n=3
Record of augmentation						
Augmentation not recorded	55%	42%	60%	56%	[33%]	[33%]
Augmented on alert line	29%	29%	29%	29%	[44%]	[33%]
Augmented between alert and action lines	13%	19%	10%	13%	[0%]	[33%]
Augmented on or right of action line	3%	10%	1%	2%	[22%]	[0%]

[1] Non-response varies across items and is less than 2.5% unless otherwise noted. Non-responses are excluded.

[2] Figures in brackets indicate that analyses are based on very few cases.

[3] Includes MCH specialty clinics and higher clinics.

[4] Includes NGO, faith-based, or mission facilities.

[5] 16% missing overall: 19% of partographs in hospitals, 15% in health centres; 7% in public/government facilities, 20% in private for-profit facilities.

Table 10.1.4 shows the components of the modified WHO partograph as standards (Figure 10.1.1 -Modified WHO partograph). The standards included in this assessment were foetal heart rate, temperature, blood pressure, pulse, contractions, cervical dilatation and descent of head, moulding and state of the membrane or colour of the liquor. They were analysed by the number of hours women were in labour.

Recordings for most of the components of the partograph were completed in most of the partographs reviewed. However, temperature (56 percent), moulding (52 percent) and descent (64 percent) were the least well recorded. Particularly, women who were in labour for more than nine hours after initial examination had their temperature recorded according to the standard only 43 percent of the time. Temperature recording in these cases is important as these women and their newborns will be at increased risk of foetal-maternal infections.

Table 10.1.4: Percent of partographs reviewed according to whether key measurements were taken and recorded as appropriate, by time between first exam and delivery, Ethiopia EmONC, 2016

	All partographs reviewed[1]	**Time between first exam and delivery** (hours)			
		< 3	3.01-5.99	6.00-8.99	≥9
	n=4,558	n=1,221	n=2,237	n=886	n=214
Key measurements taken[2]					
Temperature (standard) - observed at least every 2 hours	56%	56%	58%	53%	43%
Blood pressure (standard) - observed at least every 4 hours	81%	82%	81%	82%	73%
Maternal pulse (standard) - observed at least every 30 minutes	72%	71%	74%	70%	63%
Foetal heart beat (standard) - observed at admission	99%	98%	99%	98%	100%
Foetal heart beat (standard) - observed at least every 30 minutes	94%	92%	95%	94%	92%
Moulding - assessed every 4 hours	52%	55%	52%	51%	41%
Contractions (standard) - assessed every 30 minutes	95%	94%	96%	94%	93%
Vaginal exam (standard) - performed every 4 hours	91%	89%	92%	90%	86%
Descent - assessed at least every 4 hours	64%	63%	66%	63%	56%
State of the membrane or colour of the liquor recorded	71%	71%	72%	71%	68%

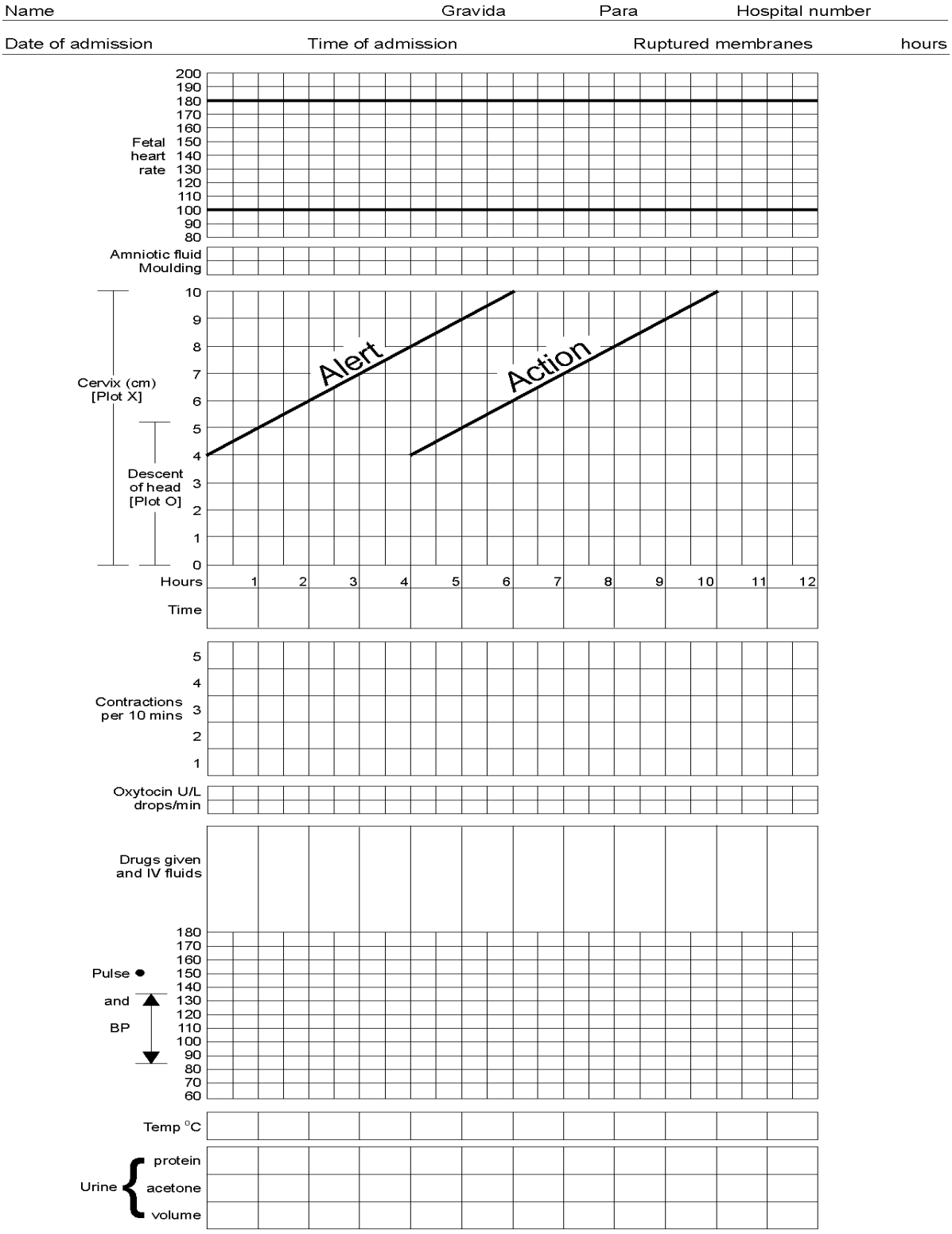
[1] This table is based only on those partographs where first dilatation was charted correctly on the alert line (n=4,838), minus 280 cases that did not indicate time between first exam and delivery.

[2] "Standard" refers to WHO guidelines for modified partograph.

The type of delivery and foetal outcome were analysed with the timing of delivery according to the partograph (Table 10.1.5A in the Appendix, page 388). The clear majority (95 percent) were delivered by spontaneous vaginal delivery, of which 78 percent took place during normal active phase of labour (on or to the left of the alert line of the partograph). Delivery by instrument or caesarean section was documented in only 47 partographs (less than 1 percent). This reflects that most of the partographs reviewed were from non-hospital facilities.

Indications for operative deliveries (vacuum, forceps, and CS) were analysed by the timing of delivery. For prolonged first stage of labour, 50 percent delivered on or to the right of the action line. Prolonged second stage and suspicion of or immediate foetal distress were indications during the normal active phase (on or

Figure 10.1.1: WHO Modified Partograph



left of the alert line) in 50 percent and 75 percent, respectively. These proportions were justifiable considering the physiological progress of labour and timing of interventions for the respective indications.

Outcomes for the baby were also analysed by the timing of delivery. The proportion of births delivered during the normal active phase of labour among normal live births (78 percent) was higher than among live births with asphyxia (73 percent) and stillbirths (64 percent). Unsurprisingly, the proportions of stillbirths and live births with asphyxia that were delivered on or beyond the alert line and action lines were higher than among normal live births.

Comparisons between 2008 and 2016

The use of the partograph increased from 30 percent in hospitals and 25 percent of health centres in 2008 to 83 percent of hospitals and 74 percent of health centres in 2016 (Table 10.1.6 and Figure 10.1.2). The proportion of partographs initiated on the alert line doubled from 45 percent in all facilities in 2008 to 92 percent in 2016.

Table 10.1.6: Number and percent of facilities that use partographs, number of partographs reviewed, and percent of partographs reviewed with first dilatation charted correctly on the alert line in 2008 and 2016, by facility type and managing authority, Ethiopia EmONC, 2016

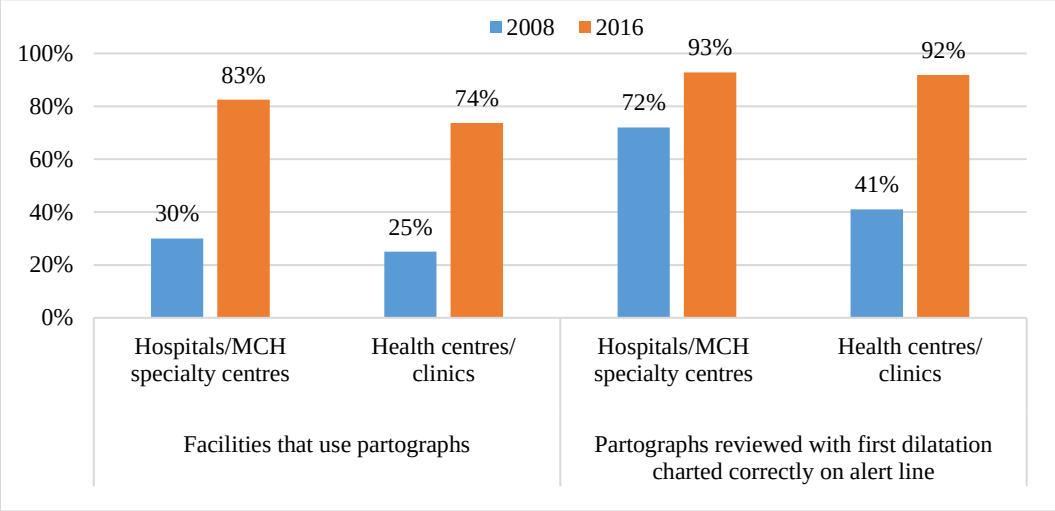
	All facilities		Facility type				Managing authority					
			Hospitals/MCH specialty centres		Health centres/clinics[1]		Public/government		Private-for-profit		Private-not-for-profit[2]	
	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016
Number of facilities	749	3,804	111	316	638	3,488	713	3,662	17	83	19	59
Number of facilities that use partographs[3]	192	2,829	33	260	159	2,569	182	2,749	4	33	6	47
Percent of facilities that use partographs	26%	74%	30%	83%	25%	74%	26%	75%	24%	40%	32%	81%
Total number of partographs reviewed	398	5,252	54	500	344	4,752	382	5,109	6	54	9	89
Percent of partographs reviewed with first dilatation charted correctly on alert line	45%	92%	72%	93%	41%	92%	44%	92%	50%	78%	100%	88%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Non-response varies across stratifying variables and is less than 2.0%. Non-responses are excluded.

Figure 10.1.2: Percent of facilities that use partographs, and percent of partographs reviewed with first dilatation charted correctly on alert line in 2008 and 2016, by facility type, Ethiopia EmONC, 2016



10.2 Caesarean delivery reviews

The objective of the caesarean delivery case review was to understand the principal clinical indications (causes) for caesarean sections and to evaluate some aspects of the quality of the procedure and record-keeping. The two most recent caesareans, as documented in the facility operating room logbook, were reviewed if they were performed in the 12 months prior to the assessment date and had been discharged.

Of the 3,804 facilities in the survey, 288 (8 percent) provided cases for caesarean review (Table 10.2.1). Of these, 97 percent provided 2 cases for review, and the remainder provided one case, giving a total of 568 caesareans for review. This is more than double the number reviewed in the 2008 EmONC assessment.

As expected, most cases came from hospitals; only 9 percent (n=49) were from health centres, MCH speciality clinics or higher clinics. Government facilities provided 409 cases while 127 were from private-for-profit facilities and 32 from private-not-for-profit facilities.

Table 10.2.1: Percent of facilities where caesarean deliveries were reviewed, number of facilities with 1 or 2 cases, and total number of cases reviewed, by region, facility type, managing authority, and EmONC classification, Ethiopia EmONC, 2016

	Number of facilities	Percent of facilities where caesareans were reviewed	Number of facilities where caesareans were reviewed and how many were reviewed[1]		Total number of caesareans reviewed
			1	2	
National	3,804	8%	8	280	568
Region					
Tigray	255	15%	2	36	74
Afar	77	9%	1	6	13
Amhara	876	5%	1	46	93
Oromia	1,405	5%	1	71	143
Somali	161	6%	0	10	20
Benishangul-Gumuz	43	5%	0	2	4
SNNP	773	7%	2	49	100
Gambella	27	4%	0	1	2
Harari	15	40%	0	6	12
Addis Ababa	151	32%	1	47	95
Dire Dawa	21	29%	0	6	12
Facility type					
Referral/specialized hospitals	30	100%	0	30	60
General hospitals	103	96%	2	97	196
Primary hospitals	160	73%	5	112	229
MCH specialty centres	23	74%	0	17	34
Health centres	3,459	1%	1	17	35
MCH specialty clinics	16	31%	0	5	10
Higher clinics	13	15%	0	2	4
Managing authority					
Public/government	3,662	6%	7	201	409
Private-for-profit	83	77%	1	63	127
Private-not-for-profit[2]	59	27%	0	16	32
EmONC classification					
CEmONC	148	96%	0	142	284
BEmONC	222	15%	2	32	66
Partially functioning[3]	3,395	3%	6	103	212
Non-EmONC[4]	39	8%	0	3	6

[1] Maximum number of caesarean deliveries reviewed was 2 per facility.

[2] Includes NGO, faith-based, or mission facilities.

[3] Partially functioning indicates facilities providing some signal functions but missing at least one BEmONC signal function.

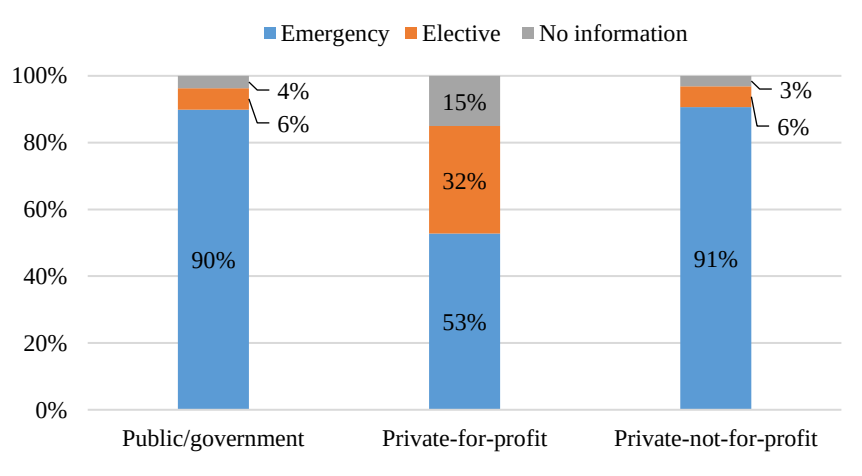
[4] Non-EmONC indicates those facilities providing no EmONC signal functions. Although 3 facilities provided case reviews, their obstetric services were just beginning, they were moving to a new facility, had attended no deliveries in recent months, or failed to provide information.

Characteristics of the women and outcomes

The average age of women was 26 years, as it was in 2008. Overall, 41 percent of the caesareans reviewed were in nulliparous women, with the highest proportion (46 percent) in government facilities compared with 25 percent in private-for-profit facilities (Table 10.2.2A in the Appendix, page 389). This may reflect increased usage of government facilities by nulliparous women compared with private-for-profit facilities. However, parity was not readily available in the medical records for 22 percent of the cases reviewed from private-for-profit facilities. Two percent of the caesareans reviewed were in women who were HIV positive.

Among the reviewed caesarean cases, 61 percent started labour spontaneously, in 6 percent labour was induced, and in 23 percent the caesarean was done before the onset of labour (Table 10.2.3). In total, 82 percent of the caesareans were emergencies and 12 percent were planned elective cases. The highest proportion of elective caesareans was seen at the private-for-profit facilities (32 percent) (Figure 10.2.1). Partograph use among the emergency cases was only 31 percent, and it was particularly poor in private-for-profit facilities (4 percent).

Figure 10.2.1: Percent distribution of caesarean deliveries reviewed according to type of caesarean, by facility type, Ethiopia EmONC, 2016



It is notable that uterotonics were administered prophylactically in 50 percent of cases, while 9 cases had intraoperative haemorrhage. Prophylactic antibiotics were given to 68 percent of the cases before the caesarean and to 90 percent after surgery. Surgery related complications (during surgery) were infrequent but included problems with intubation, bowel injury, and a uterine rupture.

Post-operative complications were recorded in 2 percent of cases. They included wound infection (4 cases), peritonitis/pelvic infection (2 cases), the need for re-laparotomy (1 case), and 6 others. There was one maternal death due to an indirect cause among the cases reviewed in 2016, compared with two deaths in the smaller number of cases reviewed in 2008.

Table 10.2.3: Percent distribution of caesarean deliveries reviewed according to delivery characteristics and maternal survival status, by managing authority, Ethiopia EmONC, 2016

	All caesareans reviewed	Managing authority		
		Public/ government	Private-for-profit	Private-not-for-profit[1]
	n=568	n=409	n=127	n=32
Onset of labour				
Spontaneous	61%	69%	36%	66%
Induced	6%	7%	6%	3%
Caesarean before labour	23%	18%	43%	19%
No information	9%	7%	15%	13%
Type of caesarean				
Emergency	82%	90%	53%	91%
Elective	12%	6%	32%	6%
No information	6%	4%	15%	3%
Partograph use (among women whose caesarean was an emergency)				
Partograph used	31%	40%	4%	28%
Partograph not used	52%	47%	64%	59%
Partograph not used because considered elective but went into labour	12%	8%	25%	6%
No information	5%	5%	7%	6%
Foetal presentation				
Cephalic	67%	72%	58%	47%
Breech	10%	9%	10%	13%
Transversal or oblique	7%	9%	0%	6%
No information	17%	11%	32%	34%
Number of neonates				
Singleton	90%	90%	89%	91%
Multiple	7%	9%	5%	0%
No information	3%	2%	6%	9%
Number of previous caesareans				
0	28%	33%	18%	26%
1	20%	16%	29%	30%
≥2	5%	5%	6%	9%
No information	46%	47%	47%	35%
Prophylactic uterotonics administered after baby delivered (% yes)	50%	52%	46%	41%
Mean time of anaesthesia (minutes)	56	57	46	88

	All caesareans reviewed	Managing authority		
		Public/ government	Private-for-profit	Private-not-for-profit[1]
	n=568	n=409	n=127	n=32
Antibiotics administered				
Before caesarean (% yes)	68%	68%	65%	75%
After caesarean (% yes)	90%	91%	91%	75%
Developed a complication during operation (n)	12	12	0	0
Problem with intubation (n)	1	1	0	0
Postpartum haemorrhage (n)	9	9	0	0
Bowel injury (n)	1	1	0	0
Other (uterine rupture) (n)	1	1	0	0
Developed a complication post-operation (n)	13	12	1	0
Wound infection (n)	4	3	1	0
Peritonitis/pelvic infection (n)	2	2	0	0
Re-laparotomy (n)	1	1	0	0
Other (anaemia, endometritis, bleeding, pre-eclampsia, pneumonia) (n)	6	6	0	0
Maternal outcome				
Alive	97%	98%	94%	94%
Dead[2]	0.2%	0.2%	0%	0%
No information	3%	1%	6%	6%

[1] Includes NGO, faith-based, or mission facilities.

[2] One woman died in a government facility due to an unspecified indirect cause.

Indications for caesarean section

Out of the 568 caesarean cases reviewed, 421 (74 percent) were due to maternal indications and 126 (22 percent) for foetal indications – i.e. foetal distress and malpresentation/abnormal lie (Table 10.2.4A in the Appendix on page 390). Indications related to cephalo-pelvic disproportion, prolonged and obstructed labour, and arrest disorders (39 percent), foetal distress and non-reassuring foetal heart rate (13 percent), and previous scar (13 percent) were the leading indications for caesarean section. Previous scar was the leading indication in private-for-profit (26 percent) and not-for-profit facilities (22 percent). Table 10.2.5 shows the type of caesarean by indication. Elective caesareans were most common among women with a previous scar (47 percent) and women with "other" maternal indications (50 percent).

Table 10.2.5: Percent distribution of caesarean deliveries reviewed according to type of caesarean, by indication for surgery, Ethiopia EmONC, 2016

	Number of caesareans reviewed	Type of caesarean			
		Emergency	Elective	No information	Total
Maternal indications					
CPD/prolonged labour[1]	282	93%	3%	4%	100%
Previous caesarean/uterine scar	71	51%	47%	3%	100%
Placenta praevia/abruption	35	83%	14%	3%	100%
Uncontrolled severe PE/E	21	76%	19%	5%	100%
Other maternal indications[2]	12	50%	50%	0%	100%
Foetal indications					
Foetal distress[3]	75	88%	8%	4%	100%
Breech	19	84%	11%	5%	100%
Cord prolapse	10	90%	0%	10%	100%
Multiple gestation	10	80%	0%	20%	100%
Other foetal indications[4]	12	57%	29%	14%	100%
No information	21	48%	0%	52%	100%

CPD = cephalo-pelvic disproportion; PE/E = pre-eclampsia/eclampsia.

[1] CPD/prolonged labour includes CPD, malpresentations, prolonged 1st and 2nd stages of labour, arrest disorders, failure to progress, failed assisted vaginal delivery, failed induction, and uterine ruptures.

[2] Other maternal indications include failed vaginal birth after caesarean, prevention of mother-to-child transmission of HIV, fistula, medical disease, maternal request, and trauma.

[3] Foetal distress includes distress, severe intrauterine growth restriction, and non-reassuring biophysical state.

[4] Other foetal indications include meconium stained amniotic fluid, post-term, preterm, intrauterine foetal death, and premature rupture of membranes.

There were 299 cases who had an emergency caesarean but were not referred from another facility (Table 10.2.6A in the Appendix, page 391). Among these, the emergency cases remained in hospital for an average of 4.9 days compared to 3.6 days for elective non-referred clients. On the other hand, referred clients, both emergency and elective caesareans, remained in hospital longer than non-referred clients, 5.2 and 5.0 days, respectively.

The mean number of days hospitalized was also analysed by indication for caesarean section, comparing clients who were referred to those who were not referred. On average, women with an indication of previous caesarean remained the shortest time (3.1 days) and women with CPD as their indication for surgery had the longest stays (4.5 days). Many indications could not be included in the table due to low number of cases.

The time lapse between decision to perform surgery and surgery itself was documented for only 34 percent of cases and the question was asked only of those women whose caesarean was considered an emergency. Because this piece of information was so poorly recorded, we did no further analysis beyond whether this information was recorded. It was noteworthy that recording was higher among referred clients with an emergency caesarean (44 percent) than among non-referred emergency caesarean clients (29 percent).

Foetal outcomes

Figure 10.2.2 shows the distribution of the newborn outcomes of the reviewed caesarean cases. Eighty-nine percent (506 of 568) resulted in a live birth, 4 percent (25 cases) were live births but with a low Apgar score, and 3 percent (16 cases) involved a stillbirth or an early neonatal death (1 case). The causes of death found in the patient charts included 2 preterm-related deaths, 6 deaths due to asphyxia, 1 case of neonatal sepsis, 1 case with a congenital anomaly, and 6 with unknown causes (data not shown).

Figure 10.2.2: Percent distribution of caesarean deliveries reviewed according to newborn outcome, Ethiopia EmONC, 2016

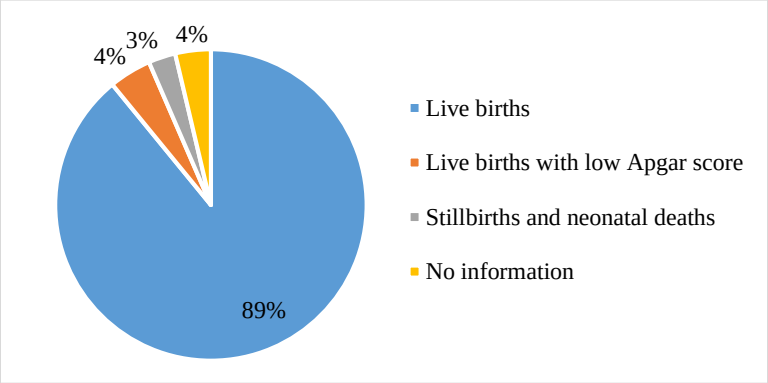


Table 10.2.7: Percent distribution of caesarean deliveries reviewed according to newborn outcome, by indication for caesarean, Ethiopia EmONC, 2016

	All caesareans reviewed	Newborn outcome			
		Live births	Live births with low Apgar score	Stillbirths and neonatal deaths[1]	No information
Indication for caesarean delivery					
Maternal indications					
CPD/prolonged labour[2]	282	90%	5%	2%	3%
Previous caesarean/uterine scar	71	94%	1%	3%	1%
Placenta praevia/abruption	35	71%	9%	11%	9%
Uncontrolled severe PE/E	21	86%	10%	0%	5%
Other maternal indications[3]	12	100%	0%	0%	0%
Foetal indications					
Foetal distress[4]	75	91%	5%	1%	3%
Breech	19	95%	0%	5%	0%
Cord prolapse	10	90%	0%	10%	0%
Multiple gestation	10	90%	10%	0%	0%
Others foetal indications[5]	12	83%	0%	8%	8%
No information	21	86%	0%	0%	14%

CPD = cephalo-pelvic disproportion; FHB = foetal heartbeat; PE/E = pre-eclampsia/eclampsia.

[1] Includes 15 stillbirths and 1 neonatal death.

[2] CPD/prolonged labour includes CPD, malpresentations, prolonged 1st and 2nd stages of labour, arrest disorders, failure to progress, failed assisted vaginal delivery, failed induction, and uterine ruptures.

[3] Other includes failed vaginal birth after CS, PMTCT of HIV, fistula, medical disease, maternal request, and trauma.

[4] Foetal distress includes distress, severe intrauterine growth restriction, and non-reassuring biophysical state.

[5] Other foetal indications include meconium stained amniotic fluid, post-term, preterm, intrauterine foetal death, and PROM.

Table 10.2.7 examines differences in newborn outcomes by indication for caesarean delivery. Adverse outcomes – the stillbirths or early neonatal death – were most prevalent among cases of placenta praevia/abruption (11 percent) and cord prolapse (10 percent). Ten percent of multiple gestations and cases of uncontrolled pre-eclampsia and eclampsia were live births but exhibited a low Apgar score.

Meconium was most likely to be recorded as present among the foetal deaths (19 percent). Fewer than two-thirds of the cases had the foetal heart beat recorded as either positive or negative (data not shown).

Caesarean delivery can be performed by several cadres. In this case, 41 percent of all reviewed cases were performed by an obstetrician/gynaecologist, followed by 31 percent performed by a general surgeon, and 21 percent by an integrated emergency surgical officer (Table 10.2.8A in the Appendix, page 392). The latter were reported mostly in government facilities, while specialist obstetricians were reported most widely in the private facilities. Nurse anaesthetists provided anaesthesia in 9 out of 10 cases or more, with little difference according to managing authority.

The data collectors were asked to identify the source documents that they used to complete the caesarean reviews (Table 10.2.9A in the Appendix, page 393). Operation notes were mentioned for 91 percent of the cases, anaesthesia sheets for 79 percent, and preoperative decision notes and progress notes for 77 percent of cases.

Comparisons between 2008 and 2016

As stated earlier, a similar review of caesarean deliveries took place in the 2008 EmONC assessment. The distribution of type of caesarean changed in 2016 with a marginally higher proportion classified as emergencies and a small increase in cases with no information (Table 10.2.10). The use of antibiotics increased though the questions in the two surveys differed slightly. In 2008 the question was posed around prophylactic administration of antibiotics with no reference to the timing; in 2016 two separate questions were asked that specified administration of antibiotics before surgery and after surgery, and 94 percent represents the administration of antibiotics either before or after the operation. Increases in the use of antibiotics could be seen among public facilities and not-for-profit private facilities. The recording of the time interval between the decision to operate and when the operation started seems to have deteriorated slightly. This decline in recording was seen in public and notably in private-for-profit facilities, but documentation seems to have improved slightly among private-not-for-profit facilities.

Table 10.2.10: Percent distribution of caesarean deliveries reviewed according to type of caesarean, whether prophylactic antibiotics were administered, and whether the decision-to-surgery time interval was recorded in 2008 and 2016, by managing authority, Ethiopia EmONC, 2016

	All facilities		Managing authority					
			Public/government		Private-for-profit		Private-not-for-profit[1]	
	2008 n=275	2016 n=568	2008 n=209	2016 n=409	2008 n=45	2016 n=127	2008 n=21	2016 n=32
Type of caesarean								
Emergency	77%	82%	83%	90%	47%	53%	85%	91%
Elective	21%	12%	15%	6%	51%	32%	15%	6%
No information	2%	6%	2%	4%	2%	15%	0%	3%
Percent of caesareans receiving prophylactic antibiotics[2] (% yes)	87%	94%	86%	94%	93%	91%	85%	94%
Record of time interval between decision to operate and surgery[3]								
Time recorded	42%	34%	42%	37%	49%	15%	33%	41%
Time not recorded/no information	58%	66%	58%	63%	51%	85%	67%	59%

[1] Includes NGO, faith-based, or mission facilities.

[2] Antibiotics could be administered either before or after the procedure. If no documentation of antibiotics could be found, we assumed the woman did not receive them. In 2008 timing was not specified, unlike 2016 when timing was specified as before or after the surgery.

[3] Time lapse from decision to surgery was asked only of emergency caesareans.

10.3 Maternal death reviews

Background

The purpose of a review of maternal deaths is to identify factors that contribute to institutional maternal mortality, and, like the other reviews, the reviews reveal aspects related to the quality of client management and record-keeping. For this assessment, the two most recent maternal deaths that occurred in the facility in the last year were reviewed by extracting information from registers and the clients' records. However, only one maternal death review was conducted if the facility had had only one death in the previous 12 months.

A total of 609 maternal deaths were reviewed from 423 health facilities (11 percent of all health facilities) (Table 10.3.1). In general, maternal death reviews were conducted from a higher proportion of hospitals than lower level facilities; the proportion of health facilities where maternal death reviews were conducted decreased as the level of the health facility in the health system decreased.

Table 10.3.1: Number of facilities where maternal deaths were reviewed and how many were reviewed, by region, facility type, managing authority, location, and EmONC classification, Ethiopia EmONC, 2016

	Number of facilities	Percent of facilities where maternal deaths were reviewed	Number of facilities where maternal deaths were reviewed and how many were reviewed[1]		Total number of maternal deaths reviewed
			1	2	
National	3,804	11%	237	186	609
Region					
Tigray	255	7%	11	7	25
Afar	77	8%	2	4	10
Amhara	876	14%	75	46	167
Oromia	1,405	13%	96	86	268
Somali	161	14%	14	9	32
Benishangul-Gumuz	43	26%	9	2	13
SNNP	773	5%	20	20	60
Gambella	27	4%	0	1	2
Harari	15	47%	2	5	12
Addis Ababa	151	7%	5	5	15
Dire Dawa	21	19%	3	1	5
Facility type					
Referral/specialized hospitals	30	80%	3	21	45
General hospitals	103	51%	10	43	96
Primary hospitals	160	36%	29	29	87
MCH specialty centres	23	13%	1	2	5
Health centres	3,459	8%	193	91	375
MCH specialty clinics	16	0%	0	0	0
Higher clinics	13	8%	1	0	1
Managing authority					
Public/government	3,662	11%	229	176	581
Private-for-profit	83	10%	3	5	13
Private-not-for-profit[2]	59	17%	5	5	15
Location					
Urban	1,497	14%	98	113	324
Rural	2,307	9%	139	73	285
EmONC classification					
CEmONC	148	66%	21	77	175
BEmONC	222	14%	18	12	42
Partially functioning[3]	3,395	9%	195	98	391
Non-EmONC[4]	39	3%	1	0	1

[1] Maximum number of maternal deaths reviewed was 2 per facility.

[2] Includes NGO, faith-based, or mission facilities.

[3] Partially functioning indicates those facilities providing some signal functions but missing at least one BEmONC signal function.

[4] Non-EmONC indicates those facilities providing no EmONC signal functions.

Among the maternal deaths reviewed, 375 reviews (62 percent) were conducted at health centres and 228 (37 percent) at hospitals. Most maternal deaths (581 of 609) were reviewed at government/public health facilities while 28 were from private health facilities. The distribution of maternal deaths reviewed by type of EmONC facility was 391 from partially functioning EmONC facilities, 175 from CEmONC and 42 from BEmONC facilities.

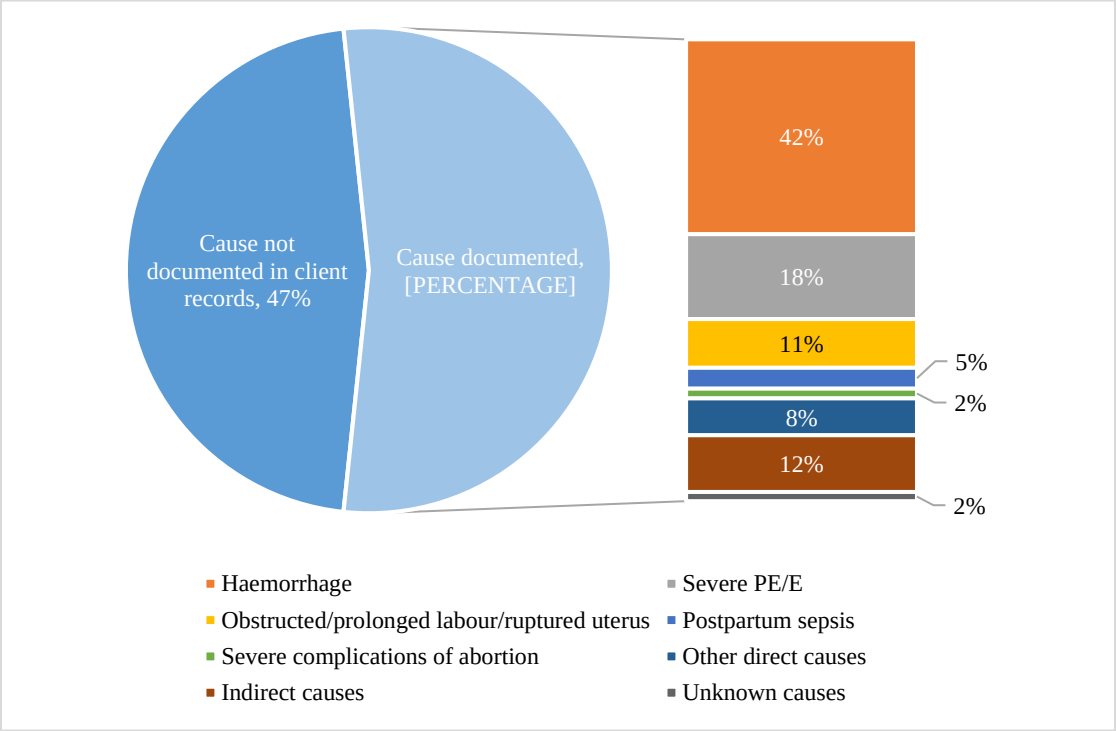
Causes of maternal death

Among the 609 reviewed maternal deaths, information on the cause of death was documented for only 324 women (53 percent) (Figure 10.3.1). Documentation of cause of death was better at hospitals than health centres, 87 percent versus 32 percent. Similarly, registering cause of death was best at not-for-profit facilities (80 percent), average at government facilities (53 percent), and poorest at private-for-profit facilities (38 percent) (data shown in the comparison between 2008 and 2016, Table 10.3.7).

In order to compare the assessment case reviews with the maternal deaths documented by recent MDSR results, we show the distribution of causes *excluding* those cases with an unknown cause of death. Of those deaths with documented cause of death 284 (86 percent) died due to direct (obstetric) causes of death and 40 (12 percent) died due to indirect causes of maternal death. Finally, 6 cases (2 percent) were documented as cause "unknown" (Figure 10.3.1 and Table 10.3.2A in the Appendix, page 394).

The documented direct primary causes of maternal death were obstetric haemorrhage in 140 women (42 percent), pre-eclampsia/eclampsia in 61 (18 percent), obstructed labour/uterine rupture in 35 (11 percent), sepsis in 15 (5 percent), abortion in 7 (2 percent), ectopic pregnancy in 2 (1 percent) and other direct causes in 24 (7 percent) women. The primary indirect causes of maternal death were severe anaemia for 11 (3 percent) women and HIV/AIDS-related in 2 (1 percent).

Figure 10.3.1: Percent distribution of reviewed maternal deaths according to cause of death, Ethiopia EmONC, 2016



Obstetric haemorrhage was the leading cause of maternal death and contributed to more than 2 out of five maternal deaths with a known cause of death. The underlying causes for obstetric haemorrhage deaths were antepartum haemorrhage in 27 cases (8 percent), postpartum haemorrhage in 97 (30 percent), and retained placenta in 16 (5 percent). Obstetric haemorrhage contributed to 65 (31 percent) and 75 (61 percent) of maternal deaths reviewed from hospitals/MCH specialty centres and health centres/clinics, respectively (Table 10.3.2A in the Appendix on page 394). On the other hand, pre-eclampsia and eclampsia contributed to 50 (24 percent) and 11 (9 percent) of maternal deaths reviewed from hospitals and MCH specialty centres and health centres and clinics, respectively.

This distribution of the causes of death described above was reportedly similar to that reported in the MDSR efforts, which suggests that perhaps no systematic bias was behind the large number of deaths without a documented cause.

Maternal characteristics and newborn outcomes

The average age of the deceased mothers was 27 years (Table 10.3.3A in the Appendix, page 395). The duration of pregnancy at the time of death was 1st trimester (<16 weeks) in 8 (1 percent), 2nd trimester (16-27 weeks) in 9 (1 percent), 3rd trimester (≥ 28 weeks) in 172 (28 percent), and was unknown in 420 (69 percent). The unknown cases could be due to the occurrence of maternal death in the postpartum period.

More than half of the newborn outcomes of the deceased mothers were perinatal deaths. Live births occurred in 144 women (26 percent), early neonatal death in 29 (5 percent), stillbirths in 250 (46 percent),

and twin birth (≥ one alive or dead) in 5 women. The 62 who died of abortion complications were excluded. No information on newborn outcomes was available for 119 (22 percent) maternal deaths. Perinatal deaths seemed to occur disproportionately among women whose cause of death was not documented.

The causes of the 34 newborn deaths (early neonatal deaths and at least one death among multiple gestation)) were asphyxia in 8 (24 percent), prematurity in 7 (21 percent), and 1 each due to infection/pneumonia, congenital anomalies and obstetric trauma. For almost half of the newborn deaths (16 of 34), no cause of death was documented.

Delivery circumstances and contributing factors to maternal death

The timing of death relative to delivery was documented in 74 percent of the reviewed maternal deaths (Table 10.3.4). Half of the maternal deaths occurred in the postpartum period, while 13 percent occurred in the intrapartum, and 10 percent in the antepartum periods. Eleven percent of deaths that took place in hospitals died during surgery. Fifty one percent of the deaths occurred on weekdays and 16 percent on the weekend.

Most of the deceased women delivered in a health centre (55 percent), 27 percent in a hospital, 8 percent at home or on the way to a health facility. Among maternal deaths reviewed from health centres/clinics and hospitals/ MCH specialty centres deliveries happened in a similar setting, 79 percent and 76 percent respectively. The place of delivery was a hospital for maternal deaths reviewed from private-for-profit facilities (77 percent) and private-not-for-profit (64 percent) facilities.

Twenty-two percent of the deceased mothers were referred to the facility where she died. Maternal deaths reviewed from hospitals showed that 53 percent had been referred, while only 2 percent of those reviewed from health centres had been referred into the health centre. Maternal death reviews from private-for-profit facilities showed no referral. Three-quarters (76 percent) of the referrals were made by health centres, 14 percent by hospitals, and 5 percent by health posts.

Table 10.3.4: Percent distribution of reviewed maternal deaths according to timing of death, selected delivery characteristics, and factors contributing to death, by cause of death, facility type, and managing authority, Ethiopia EmONC, 2016

	All maternal deaths reviewed	Cause of death			Facility type		Managing authority		
		Direct causes	Indirect causes	Unknown causes/no information	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=609	n=284	n=40	n=285	n=233	n=376	n=581	n=13	n=15
Timing of death									
During pregnancy/before delivery	10%	17%	15%	3%	14%	8%	10%	0%	20%
During or after an abortion	1%	2%	0%	0%	2%	1%	1%	0%	0%
During vaginal delivery	9%	10%	3%	9%	3%	13%	9%	15%	7%
During obstetric surgery	4%	7%	10%	1%	11%	0%	4%	0%	7%
After delivery	50%	55%	73%	41%	58%	44%	50%	54%	47%
No information	26%	9%	0%	46%	12%	34%	26%	31%	20%
Day of the week of death									
Weekday	51%	59%	68%	41%	55%	48%	51%	23%	60%
Weekend	16%	18%	20%	13%	21%	13%	16%	8%	7%
No information	33%	23%	13%	46%	24%	39%	32%	69%	33%
Type of delivery									
Vaginal	73%	65%	50%	84%	46%	89%	74%	54%	55%
Instrumental	11%	18%	38%	2%	30%	0%	10%	31%	18%
Caesarean	4%	8%	6%	1%	11%	0%	4%	0%	18%
Destructive (craniotomy, embryotomy)	1%	3%	3%	0%	4%	0%	1%	0%	9%
Laparotomy	0%	1%	0%	0%	1%	0%	0%	0%	0%
No information	10%	6%	3%	13%	8%	11%	10%	15%	0%
Location of delivery									
At home	7%	14%	9%	2%	7%	8%	7%	15%	0%
On the way to the health facility	1%	2%	0%	0%	2%	1%	1%	0%	0%
In a health centre	55%	33%	18%	78%	10%	79%	56%	0%	36%
In a hospital	27%	45%	70%	7%	76%	1%	26%	77%	64%

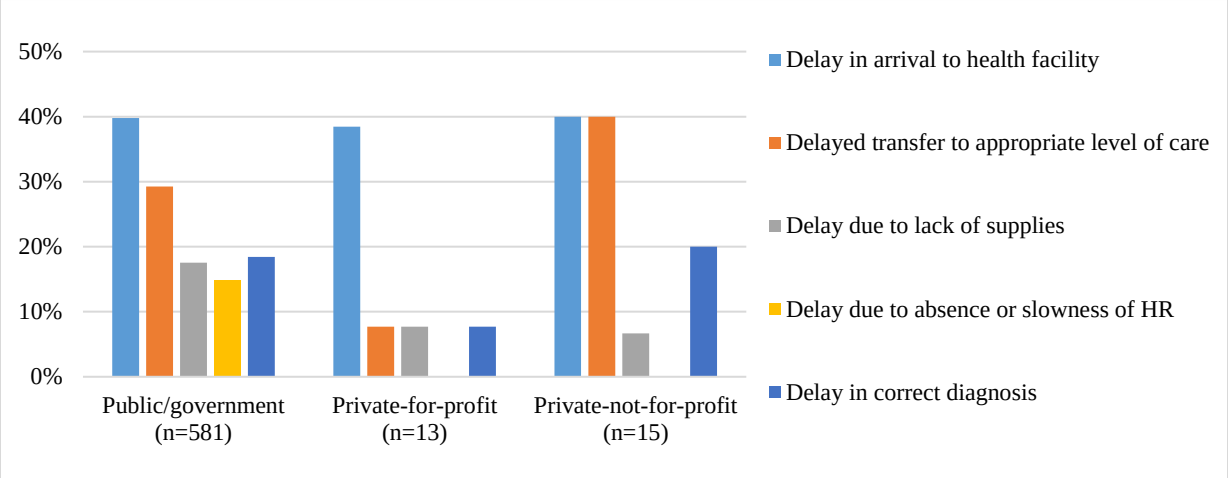
	All maternal deaths reviewed	Cause of death			Facility type		Managing authority		
		Direct causes	Indirect causes	Unknown causes/no information	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=609	n=284	n=40	n=285	n=233	n=376	n=581	n=13	n=15
Other (1 case specified as MCH centre)	0%	0%	0%	0%	1%	0%	0%	8%	0%
No information	9%	6%	3%	13%	5%	12%	10%	0%	0%
Referred (% yes)	22%	38%	40%	3%	53%	2%	22%	0%	13%
Referred by:	n=132	n=107	n=16	n=9	n=124	n=8	n=130	n=0	n=2
Health extension worker	5%	6%	0%	11%	3%	38%	5%	0%	0%
Health centre	76%	78%	69%	67%	79%	25%	75%	0%	100%
Hospital	14%	12%	31%	0%	15%	0%	14%	0%	0%
Private hospital/private clinic	2%	1%	0%	11%	1%	13%	2%	0%	0%
Other (1 case specified as 'nurses')	1%	1%	0%	0%	0%	13%	1%	0%	0%
No information	3%	3%	0%	11%	2%	13%	3%	0%	0%
Factors contributing to death (multiple responses possible)	n=609	n=284	n=40	n=285	n=233	n=376	n=581	n=13	n=15
Delay in arrival to health facility (% yes)	40%	53%	30%	28%	45%	36%	40%	38%	40%
Delayed transfer to appropriate level of care (% yes)	29%	43%	38%	14%	38%	23%	29%	8%	40%
Delay due to lack of supplies (% yes)	17%	23%	10%	13%	17%	17%	18%	8%	7%
Delay due to absence or slowness of human resources (% yes)	14%	21%	20%	7%	23%	9%	15%	0%	0%
Delay in correct diagnosis (% yes)	18%	21%	48%	12%	25%	14%	18%	8%	20%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

More than one delay factor can contribute to a single maternal death. The assessment of whether a delay occurred was not recorded as such in the woman's charts, but deduced by data collectors from information available in the woman's records and/or from discussion with staff. Thus, the assessment was subjective. Generally, the contributing factors were delays in arrival to health facility (40 percent), delays in transfer to an appropriate level of care (29 percent), delays in correct diagnosis (18 percent), delays due to lack of supplies (17 percent), and delays due to absence or slowness of human resources (14 percent). However, for maternal deaths due to indirect causes, the leading contributing factors were delays in correct diagnosis (47 percent), and delays in transfer to an appropriate level of care (38 percent). Figure 10.3.2 presents the contributing factors by managing authority.

Figure 10.3.2: Percent of reviewed maternal deaths according to factors contributing to death, by managing authority, Ethiopia EmONC, 2016



EmONC interventions provided to deceased mothers

Overall, the interventions most frequently provided to this group of women were IV fluids (44 percent), antibiotics (33 percent), oxytocics (25 percent), and oxygen (23 percent) (Table 10.3.5). The EmONC management modalities are described below according to specific causes of death.

Among the obstetric haemorrhage deaths (APH, PPH and retained placenta), 65 – 70 percent were given IV fluids. Very few women were provided plasma (5-15 percent of PPH and APH clients) and between 6 and 32 percent of these mothers received blood transfusions. Oxytocics were provided for 22 – 48 percent of haemorrhage clients, manual removal of placenta was performed for 14 percent of women who had PPH and 19 percent with retained placenta. Hysterectomy and laparotomy were management modalities in about 5 percent of PPH cases, 11-15 percent of APH cases, and hysterectomy was performed for 6 percent of women who died of a retained placenta.

Maternal deaths due to mechanical factors (obstructed labour or uterine rupture) were treated with IV fluids in 60 percent and 87 percent, respectively. About half of the cases of ruptured uterus received blood transfusion and/or antibiotics. A caesarean section was performed for 25 percent of the women who died of obstructed or prolonged labour and for 33 percent of the women with a ruptured uterus. Hysterectomy and laparotomy were performed on 40 percent and 33 percent, respectively, of the cases of ruptured uterus.

Deaths due to pre-eclampsia or eclampsia were treated with magnesium sulphate (72 percent), IV fluids (69 percent), antibiotics (61 percent), and oxygen (54 percent). The delivery modalities were vacuum extraction for 7 percent, forceps delivery for 3 percent, and caesarean section for 13 percent.

Women who died of postpartum sepsis received antibiotics (87 percent), IV fluids (87 percent), oxytocics (53 percent), caesarean section (40 percent), oxygen (40 percent), and blood transfusion (33 percent).

Deaths due to severe complications of abortion were managed mainly by manual vacuum aspiration for 43 percent of the women. Hysterectomy and laparotomy were conducted on 29 percent and 43 percent of these deceased women, respectively. IV fluids and blood transfusion were given to these women in 86 percent and 43 percent of the cases, respectively.

Finally, women who died of anaemia were treated with IV fluids (100 percent), antibiotics (64 percent), oxytocics (55 percent), blood transfusion (36 percent), and oxygen (36 percent).

Table 10.3.5: Percent of reviewed maternal deaths according to treatment, by cause of death, Ethiopia EmONC, 2016

	All maternal deaths reviewed	Treatment[1]															
		IV fluids	Plasma	Blood trans-fusion	Anti-biotics	Oxy-tocics	Magne-sium sulphate	Manual removal of placenta	Manual vacuum aspiration	Forceps	Vacuum extraction	Caesar ean	Hyste-rectomy	Lapa-rotomy	Oxygen	Anti-malarials	Other
All causes	609	44%	4%	14%	33%	25%	11%	5%	1%	1%	1%	12%	4%	4%	23%	2%	7%
Direct causes																	
PPH	97	65%	5%	32%	39%	48%	4%	14%	1%	1%	0%	11%	6%	5%	30%	2%	11%
APH	27	70%	15%	30%	48%	22%	0%	4%	0%	0%	4%	26%	11%	15%	33%	0%	7%
Retained placenta	16	69%	0%	6%	44%	31%	13%	19%	0%	0%	0%	6%	6%	0%	19%	6%	6%
Obstructed/prolonged labour	20	60%	0%	5%	30%	25%	15%	0%	0%	0%	0%	25%	5%	5%	40%	5%	15%
Ruptured uterus	15	87%	13%	47%	53%	20%	13%	7%	0%	0%	0%	33%	40%	33%	60%	0%	7%
Severe PE/E	61	69%	7%	16%	61%	30%	72%	7%	2%	3%	7%	13%	0%	0%	54%	5%	15%
Postpartum sepsis	15	87%	0%	33%	87%	53%	7%	0%	0%	0%	0%	40%	7%	20%	40%	13%	0%
Severe complications of abortion	7	86%	0%	43%	86%	0%	0%	0%	43%	0%	0%	0%	29%	43%	43%	0%	14%
Ectopic pregnancy	2	50%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%
Other direct causes	24	88%	13%	21%	71%	50%	21%	8%	0%	8%	0%	46%	4%	4%	63%	0%	17%
Indirect causes																	
Anaemia	11	100 %	27%	36%	64%	55%	9%	9%	0%	9%	0%	9%	0%	0%	36%	27%	9%
HIV/AIDS-related	2	50%	0%	50%	50%	0%	0%	0%	0%	0%	0%	50%	0%	0%	50%	0%	0%
Other indirect causes	27	70%	4%	22%	81%	41%	12%	7%	0%	7%	0%	37%	4%	4%	44%	0%	15%
Unknown causes	6	33%	0%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%
No information	279	13%	0%	1%	9%	12%	0%	2%	0%	0%	1%	3%	0%	0%	3%	1%	1%

APH = antepartum haemorrhage; PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

[1] Reporting of multiple treatments/interventions was possible.

Comparison of facilities where death reviews were conducted with facilities reporting no deaths

Table 10.3.6A in the Appendix page 396 shows a comparison between facilities that reported no maternal deaths in the 12 months preceding the interview with facilities that contributed at least one maternal death review. The differences between these two sets of facilities are reassuring on the one hand – women who died in facilities were able to reach large, relatively well equipped facilities with more amenities. Instead of only 9 maternity beds, the facilities where maternal death reviews were done had on average 18 beds. Compared to facilities with no maternal deaths, these larger facilities had greater access to electricity and to water on-site. These facilities also had greater access to their own functional motorized ambulance and operating theatre, and better access to units of blood for transfusion. Presumably they should be able to save more lives than the smaller, less well equipped facilities. On the other hand, the comparisons also reveal deficiencies in infrastructure and access to life-saving supplies even among the larger facilities where maternal deaths occurred.

Comparisons between 2008 and 2016

Table 10.3.7 compares the women whose deaths were reviewed in 2008 and in 2016 on three points: the percentage of women who were referred from the community or another facility, causes of death, and newborn survival. On the first point, the women whose deaths were reviewed in 2016 were less likely to have been referred than in 2008; 36 percent of the maternal deaths in 2008 had been referred compared to 22 percent in 2016. This could reflect improved access to a functioning facility as a result of the construction and equipping of many new facilities during the 8 years between surveys, diminishing the need to refer. Referral capacity also substantially strengthened during this period, making a less effective referral system an unlikely explanation.

The primary distinction between the two distributions for cause of death is the increased proportion – from 12 percent to 47 percent – of missing information on the cause of death. This may be attributed to a reluctance to record maternal deaths in a time of heightened sensitivity or insecurity regarding diagnostic skills. By examining the distribution of causes after removing this group of women where cause of death went unrecorded (Table 10.3.2), the changes that stand out are: 1) an increase in the percentage of maternal deaths due to PPH and retained placenta (17 percent in 2008 versus 34 percent in 2016), and 2) reductions in the percentage of deaths due to ruptured uterus (16 percent versus 5 percent), deaths related to abortion (9 percent versus 2 percent), and deaths due to sepsis (11 percent versus 5 percent). These results should be interpreted very cautiously since almost half of all reviews had no cause of death, and the true distribution of cause could be very different from what is calculated by excluding all deaths without a cause.

Foetal or newborn survival status among the women whose deaths were reviewed might have worsened. In 2008, 43 percent of the newborns died while in 2016 this percentage increased to 52 percent; however, 22 percent of cases in 2016 had no information about newborn survival. That said, reporting on newborn status appears to have improved in 2016; the percentage of cases with no available information on the newborn's survival decreased from 31 percent in 2008 to 22 percent in 2016.

Table 10.3.7: Percent distribution of reviewed maternal deaths according to whether the woman was referred from community or another facility, cause of death, and newborn survival status in 2008 and 2016, by managing authority, Ethiopia EmONC, 2016

	All maternal deaths reviewed		Managing authority					
			Public/government		Private-for-profit		Private-not-for-profit[1]	
	2008 n=185	2016 n=609	2008 n=167	2016 n=581	2008 n=3	2016 n=13	2008 n=10	2016 n=15
Referred from community or another facility (% yes)	36%	22%	32%	22%	0%	0%	20%	13%
Cause of death								
Direct causes								
PPH/retained placenta	17%	19%	17%	19%	33%	15%	0%	20%
Severe PE/E	15%	10%	15%	10%	0%	8%	10%	7%
Ruptured uterus	16%	3%	15%	2%	0%	0%	40%	13%
Postpartum sepsis	11%	3%	11%	2%	33%	15%	10%	0%
Obstructed/prolonged labour	9%	3%	10%	3%	0%	0%	0%	0%
Severe abortion complications	9%	1%	9%	1%	0%	0%	10%	0%
APH	4%	4%	4%	5%	0%	0%	0%	7%
Other direct causes	1%	4%	1%	4%	33%	0%	10%	13%
Indirect causes								
Anaemia	3%	2%	3%	2%	0%	0%	10%	0%
Malaria	2%	0%	2%	0%	0%	0%	10%	0%
HIV/AIDS	1%	0%	1%	0%	0%	0%	0%	0%
Other indirect causes	0%	4%	0%	4%	0%	0%	0%	20%
Unknown causes/no information	12%	47%	12%	47%	0%	62%	0%	20%
Newborn survival status[2]	n=135	n=547	n=125	n=522	n=3	n=13	n=7	n=12
Survived	24%	26%	24%	26%	33%	8%	29%	42%
Did not survive	43%	52%	42%	52%	33%	77%	71%	42%
No information	33%	22%	34%	22%	33%	15%	0%	17%

APH = antepartum haemorrhage; PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

[1] Includes NGO, faith-based, or mission facilities.

[2] Analysed among women who were known to have delivered.

10.4 Maternal complication reviews

Reviews of maternal complications were conducted for 2,840 cases from 1,795 health facilities (Table 10.4.1A in the Appendix page 397). The cases were PPH (1,497), severe preeclampsia or eclampsia (959) and sepsis (384). The cases were obtained predominantly from health centres and clinics, public/government facilities, and partial EmONC facilities.

Most of the women whose cases were reviewed were between the ages of 18-29 years (Table 10.4.2). As age increased the percentage of cases reviewed decreased. Although case selection was not random, this decrease in cases as age increased might be expected since the number of pregnancies decreases as maternal age increases. Similarly, very few reviewed cases were among women less than 18 or over the age of 40.

Between 37 and 59 percent of each group of morbidity reviews was either nulliparous or primiparous. The relative proportion of nulliparous/primiparity was highest in women with severe pre-eclampsia or eclampsia, an age group known to be at high risk of pre-eclampsia and eclampsia.

Table 10.4.2: Percent distribution of reviewed maternal morbidities according to woman's age and parity, by morbidity type, Ethiopia EmONC, 2016

	Postpartum haemorrhage	Severe pre-eclampsia/ eclampsia	Sepsis
	n=1,497	n=959	n=384
Age (in years)			
<18	1%	2%	2%
18-24	33%	43%	31%
25-29	30%	29%	34%
30-34	19%	14%	19%
35-39	12%	8%	9%
≥40	3%	2%	3%
No information	3%	3%	2%
Mean age (in years)	27	25	27
Parity (index pregnancy)			
Nulliparous (0 parity, first delivery)	24%	44%	22%
Parity 1	13%	14%	15%
Multiparous (2-4 parity)	27%	19%	25%
Grand multiparous (≥5 parity)	14%	7%	12%
No information	23%	16%	26%

Status on admission and management of PPH cases

Among PPH cases, 69 percent had no evidence of complications in a previous pregnancy (Table 10.4.3). The most frequently reported problem was a previous stillbirth or early neonatal death (3 percent). Referral from another facility was recorded in 12 percent of cases reviewed. At admission, blood pressure was recorded in 67 percent, pulse rate for 50 percent, and consciousness for 88 percent. The estimated blood loss was recorded in only 13 percent of PPH cases.

The causes of PPH were known for 39 percent of cases: 19 percent were due to retained placenta, 14 percent due to uterine atony, 6 percent due to trauma, and 1 percent due to blood clotting disorders, and other causes (multiple gestations, anaemia, cord prolapse, intrauterine foetal death). Augmentation or induction of labour with oxytocic was recorded for 7 percent. In addition to the PPH, an additional complication was documented in 11 percent of cases. These complications included APH (3 percent), multiple pregnancy (2 percent), pre-eclampsia/eclampsia (2 percent), and others (uterine myoma, anaemia, breech, asthma, HIV infection, chronic hypertension, etc. (1 percent).

The mode of delivery for the PPH cases was spontaneous vaginal delivery (SVD) (87 percent), instrumental delivery (2 percent), and caesarean delivery (3 percent).

Table 10.4.3: Percent distribution of reviewed postpartum haemorrhage (PPH) cases according to complications in previous pregnancy, vital signs checked, cause of PPH, and antecedents, by facility type and managing authority, Ethiopia EmONC, 2016

	All PPH cases	Facility type		Managing authority		
		Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=1,497	n=390	n=1,107	n=1,428	n=34	n=35
Complications in previous pregnancy						
None/no information	69%	61%	72%	70%	62%	49%
Stillbirth or early neonatal death	3%	4%	2%	3%	3%	0%
Uterine scar	1%	2%	0%	1%	6%	3%
History of peripartum haemorrhage	1%	1%	1%	1%	0%	0%
History of abortion	1%	2%	1%	1%	12%	0%
Other[3]	1%	3%	1%	1%	0%	0%
No previous pregnancy	24%	27%	23%	24%	18%	49%
Referred from another facility (% yes)	12%	40%	2%	12%	9%	17%
Vital signs checked on admission (% yes)						
Blood pressure	67%	86%	60%	66%	94%	74%
Pulse	50%	79%	40%	49%	76%	51%
Consciousness	88%	89%	88%	88%	94%	91%
Estimate of blood loss	13%	18%	11%	12%	59%	26%
Cause of PPH						
Retained placenta	19%	33%	14%	19%	12%	14%
Uterine atony	14%	25%	10%	13%	29%	20%
Trauma	6%	12%	4%	6%	12%	9%
Clotting disorder	1%	1%	1%	0%	6%	6%
Other[4]	1%	1%	0%	1%	0%	0%
No information	61%	28%	72%	61%	41%	51%
Antecedents						
Labour augmented or induced						
No/no information	93%	85%	95%	93%	71%	80%
Yes, with oxytocin	7%	13%	4%	6%	26%	17%
Yes, with other uterotonic	1%	2%	0%	1%	3%	3%
Presence of complication other than PPH						
None/no information	89%	79%	92%	90%	76%	77%
Antepartum haemorrhage	3%	4%	3%	3%	6%	9%
Multiple pregnancy	2%	4%	2%	2%	3%	3%
Uterine myoma	0%	1%	0%	0%	0%	0%
Pre-eclampsia/eclampsia	2%	4%	1%	2%	3%	0%
Other direct obstetric complication	1%	3%	0%	1%	6%	9%
Other indirect obstetric complication	1%	4%	0%	1%	3%	0%
Other[5]	1%	1%	1%	1%	3%	3%
Episiotomy (% yes)	10%	11%	10%	10%	15%	17%
Mode of delivery						
Vaginal	87%	78%	90%	88%	56%	83%
Instrumental	2%	6%	1%	2%	3%	6%
Caesarean	3%	9%	0%	1%	38%	11%
No information	8%	7%	8%	8%	3%	0%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

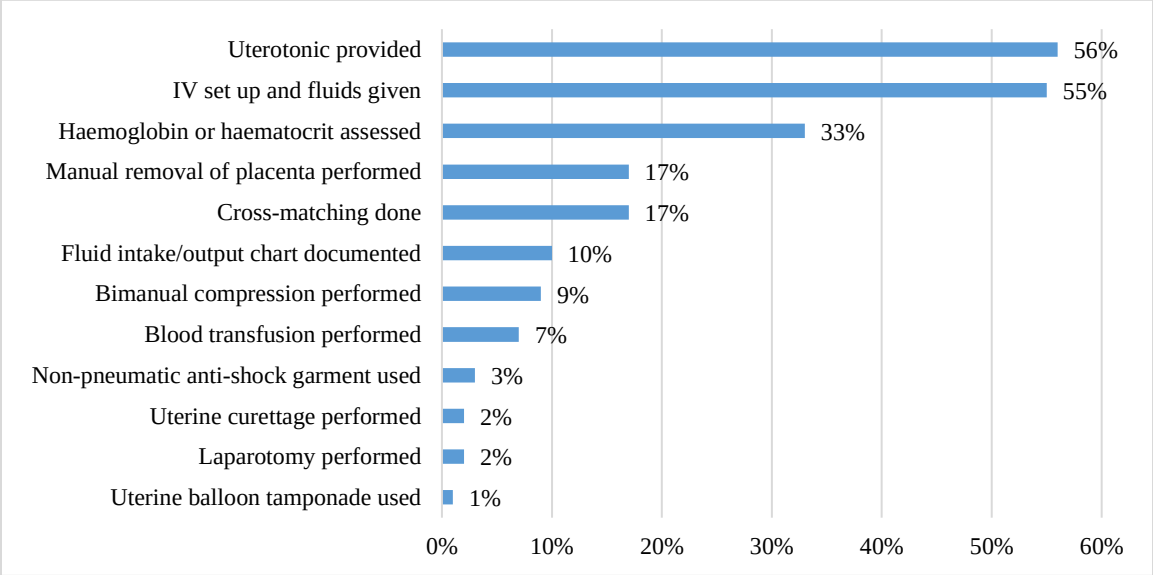
[3] Other complications in previous pregnancies include anaemia, hyperemesis gravidarum, Rh positive, twins, bleeding disorders, uterine myomas and/or other tumours, and unspecified bad obstetric outcomes.

[4] Other causes of PPH include twins, anaemia, cord prolapse, intrauterine foetal death, and adnexal complex mass.

[5] Other complications include anaemia, breech, asthma, chronic hypertension, HIV infection, Rh incompatibility, grand multiparous, and erythroblastosis.

The main treatment modalities for PPH complications (Table 10.4.4A in Appendix, page 398, and Figure 10.4.1) were IV fluids (55 percent), oxytocin (45 percent), assessment of Hgb/Hct (33 percent), manual removal of placenta and cross-matching (17 percent each), bimanual uterine compression (9 percent), and blood transfusion (7 percent). The use of the non-pneumatic anti-shock garment, uterine curettage, uterine balloon tamponade, laparotomy, and use of ergometrine or misoprostol were recorded but uncommon.

Figure 10.4.1: Percent of reviewed postpartum haemorrhage cases according to treatment, Ethiopia EmONC, 2016



Perinatal death was recorded in 6 percent of cases with PPH; stillbirths were observed in 5 percent and early neonatal deaths were in 0.6 percent of PPH cases. No perinatal deaths were recorded in private-for-profit health facilities. But no significant difference was observed between hospital/MCH speciality centres and health centres/clinics.

Status on admission and management of pre-eclampsia or eclampsia (PE/E)

Among the 959 cases with severe pre-eclampsia or eclampsia, 19 percent were referred from another facility (Table 10.4.5). At admission, vital signs were checked for blood pressure, pulse, consciousness and respiratory rate in 87 percent, 60 percent, 85 percent and 45 percent, respectively. Seizure and proteinuria were documented in 18 percent and 43 percent of the cases, respectively.

Information about the provision of anti-hypertensives was documented in 48 percent of the PE/E cases. Hydralazine, the most commonly used anti-hypertensive drug, was given in 33 percent of PE/E cases. Methyldopa (6 percent) and nifedipine (5 percent) were the next most commonly used anti-hypertensive drugs.

A loading dose of magnesium sulphate was documented in 34 percent of the cases, while a maintenance dose was documented in 29 percent of cases. Monitoring for the side effects of magnesium sulphate was

generally low: respiratory rate was checked for 35 percent of cases, urine output was monitored for 20 percent of cases, and tendon reflexes were monitored for 11 percent of cases.

The mode of delivery in the PE/E cases was recorded for 63 percent of cases. SVD occurred in 47 percent, instrumental delivery in 4 percent and caesarean delivery in 12 percent. In the postpartum period, blood pressure was recorded > 2 times in 43 percent and urine output was recorded in 17 percent.

Information on newborn morbidity was documented in only 16 percent of PE/E cases. Low birth weight was recorded in 10 percent of cases, and birth asphyxia in 3 percent. Likewise, information on newborn survival was absent in 42 percent of cases. Among PE/E cases, perinatal death occurred in nine percent (8 percent stillbirths and 1 percent early neonatal deaths).

Table 10.4.5: Percent distribution of reviewed severe pre-eclampsia and eclampsia (PE/E) cases according to complications in previous pregnancy, vital signs checked, treatment, characteristics of delivery, monitoring, and newborn outcomes, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	All severe PE/E cases	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=959	n=417	n=542	n=863	n=60	n=36
Complications in previous pregnancy						
None/no information	47%	35%	56%	47%	37%	47%
Stillbirth or early neonatal death	3%	4%	2%	3%	2%	3%
History of PE/E	2%	4%	1%	2%	5%	0%
History of diabetes mellitus	1%	1%	0%	0%	3%	0%
History of chronic hypertension	1%	1%	1%	1%	0%	0%
History of abortion	3%	4%	1%	2%	13%	3%
No previous pregnancy	44%	51%	39%	44%	40%	47%
Referred from another facility (% yes)	19%	40%	3%	19%	23%	17%
Vital signs checked on admission (% yes)						
Blood pressure	87%	99%	78%	86%	97%	94%
Pulse	60%	86%	40%	59%	80%	58%
Consciousness	85%	87%	84%	84%	95%	92%
Respiratory rate	45%	74%	23%	46%	43%	36%
Experienced seizures	18%	24%	14%	19%	12%	8%
Treatment						
Proteinuria results documented (% yes)	43%	62%	29%	43%	53%	44%
Antihypertensive administered						
Hydralazine	33%	52%	18%	31%	58%	36%
Methyldopa/aldomet	6%	6%	5%	6%	5%	6%
Nifedipine	5%	9%	2%	5%	2%	3%
Both hydralazine and nifedipine	2%	4%	0%	2%	5%	0%
Other[3]	2%	2%	2%	2%	2%	6%
No information	52%	27%	72%	54%	28%	50%
Loading dose of magnesium sulphate given (in grams)						
1	1%	1%	0%	0%	3%	0%
2	0%	0%	0%	0%	0%	0%
3	0%	0%	0%	0%	0%	0%
4	10%	14%	7%	11%	2%	6%
5	3%	7%	1%	3%	8%	11%
7	0%	0%	0%	0%	0%	0%
8	1%	1%	0%	1%	0%	0%
9	3%	4%	2%	2%	12%	0%
10	4%	7%	2%	4%	0%	14%
14	11%	20%	4%	11%	5%	8%
15	0%	0%	1%	0%	0%	0%
16	1%	1%	0%	1%	0%	0%
No information	66%	44%	84%	66%	70%	61%

	All severe PE/E cases	Facility type		Managing authority		
		Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=959	n=417	n=542	n=863	n=60	n=36
Maintenance dose(s) given (% yes)	29%	59%	5%	28%	30%	36%
Respiratory rate monitored (% yes)	35%	69%	9%	34%	45%	50%
Urine output monitored (% yes)	20%	43%	2%	18%	50%	25%
Tendon reflexes monitored (% yes)	11%	23%	2%	10%	13%	25%
Time between admission and delivery[4] (hours)	n=260	n=183	n=77	n=225	n=25	n=10
Mean	14	16	8	13	22	18
Median	6	7	5	6	18	14
Mode of delivery						
Vaginal	47%	55%	41%	49%	25%	33%
Instrumental	4%	8%	1%	4%	2%	3%
Caesarean	12%	26%	1%	7%	67%	44%
No information	37%	11%	57%	40%	7%	19%
Postpartum monitoring (% yes)						
Blood pressure recorded >2 times	43%	79%	15%	40%	73%	58%
Urine output recorded before discharge	17%	33%	5%	16%	35%	22%
Number of days hospitalized noted	41%	72%	17%	37%	82%	64%
Newborn outcomes						
Newborn morbidity						
None/no information	84%	73%	93%	85%	77%	78%
Low birth weight	10%	17%	4%	9%	15%	17%
Birth asphyxia	3%	4%	2%	3%	0%	0%
Meconium aspiration syndrome	1%	2%	0%	1%	3%	0%
Macrosomia	0%	0%	0%	0%	2%	0%
Other[5]	2%	3%	1%	2%	3%	6%
Newborn survival status						
Alive at discharge	48%	65%	35%	46%	72%	67%
Stillbirth	8%	13%	3%	8%	5%	11%
Early neonatal death	1%	2%	0%	1%	2%	0%
Multiple gestation (live birth + stillbirth)	1%	0%	1%	1%	0%	0%
No information	42%	19%	61%	45%	22%	22%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Other drugs listed as antihypertensives included furosemide, diazepam, magnesium sulphate, and hydralazine + aldomet.

[4] Measured only among those for whom it could be calculated.

[5] Other newborn morbidities include preterm birth, stillbirth, and no complications.

Table 10.4.6: Percent distribution of reviewed sepsis cases according to complications in previous pregnancy, vital signs on admission, treatment, mode of delivery, and newborn outcome, by facility type and managing authority, Ethiopia EmONC, 2016

	All sepsis cases	Facility type		Managing authority		
		Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=384	n=232	n=152	n=363	n=10	n=11
Complications in previous pregnancy						
None/no information	72%	70%	76%	72%	80%	64%
Stillbirth or early neonatal death	3%	4%	1%	3%	0%	0%
History of puerperal sepsis	1%	1%	1%	1%	0%	18%
History of abortion	2%	1%	2%	2%	0%	0%
Other	1%	1%	1%	1%	0%	0%
No previous pregnancy	22%	23%	20%	22%	20%	18%
Referred from another facility (% yes)	23%	36%	3%	23%	20%	18%
Vital signs checked on admission (% yes)						
Blood pressure	82%	90%	68%	82%	80%	64%
Pulse	68%	87%	39%	67%	80%	64%
Consciousness	85%	86%	84%	85%	80%	82%
Temperature	62%	73%	45%	61%	70%	64%
Treatment (% yes)						
Pelvic exam(s) during labour documented	26%	24%	28%	26%	10%	27%
Episiotomy performed	8%	9%	6%	8%	10%	9%
Broad spectrum antibiotics given						
Ampicillin/cephalosporins	69%	84%	45%	68%	90%	73%
Gentamicin	4%	3%	5%	4%	0%	0%
No/no information	27%	12%	51%	28%	10%	27%
Metronidazole given	56%	77%	24%	56%	40%	64%
Blood count with white cell component assessed	36%	56%	7%	36%	60%	45%
Blood culture for bacteria performed	2%	3%	1%	2%	0%	0%
Mode of delivery						
Vaginal	68%	63%	74%	70%	30%	36%
Instrumental	3%	4%	1%	3%	0%	0%
Caesarean	14%	19%	5%	11%	60%	45%
No information	16%	13%	20%	16%	10%	18%
Vital signs monitored (% yes)						
Blood pressure	53%	75%	20%	52%	80%	64%
Pulse	48%	72%	11%	47%	80%	55%
Body temperature	44%	62%	16%	42%	60%	73%
Urine output	5%	5%	4%	4%	0%	18%
Newborn outcome						
Alive at discharge	58%	60%	55%	58%	60%	64%
Stillbirth	8%	7%	10%	9%	10%	0%
Early neonatal death	0%	0%	0%	0%	0%	0%
Multiple gestation (live birth + stillbirth)	1%	0%	1%	1%	0%	0%
No information	33%	32%	34%	33%	30%	36%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Status on admission and management of maternal sepsis

There were 384 cases of maternal sepsis that were reviewed in this assessment. The most frequently reported complication in a previous pregnancy was a perinatal death among 3 percent of cases (Table 10.4.6). Among sepsis cases, 23 percent were referred from another facility. Vital signs at admission were recorded in 62 percent for temperature, 68 percent for pulse, 81 percent for blood pressure, and 85 percent for consciousness. The overall recording of vital signs was low in health centres and MCH clinics, especially temperature and pulse, which were recorded in only 45 percent and 39 percent of cases, respectively.

Evidence that the white blood cell count was investigated was found in only 36 percent of cases with maternal sepsis. Treatment with antibiotics was documented in 73 percent of cases. Ampicillin or cephalosporines were given to 69 percent, metronidazole to 56 percent, and gentamicin to 4 percent of cases.

Vital signs were monitored in the sepsis cases as followed: blood pressure, pulse and temperature were monitored in 53 percent, 48 percent and 44 percent, respectively. However, urine output was only monitored in 5 percent of maternal sepsis cases. The perinatal outcomes of these cases were stillbirths among 8 percent of cases and early neonatal deaths in 0.3 percent.

10.5 Neonatal and young infant complication reviews

A total of 5,881 neonatal and young infant case records who had breathing difficulties, were preterm or low birth weight (<2000 grams), or had signs of infection (< 60 days of age) were identified and 5,835 were analysed (Table 10.5.1). Of the neonates with breathing difficulties and the young infants with infections, about 15 percent were from hospitals while 85 percent were from health centres. Twenty-six percent of preterm/low birth weight babies were identified in hospitals and 74 percent in health centres, but nearly all cases were from public facilities regardless of morbidity.

Instructions to the data collectors on the selection for the preterm and low birth weight babies included a maximum weight of 2000 grams. To comply with the original intent, 46 newborns weighing more than 2000 grams were dropped from the analyses in the tables that follow.

Table 10.5.1: Percent distribution of facilities where cases of newborn morbidities were reviewed according to number of cases reviewed, facility type, managing authority, and EmONC classification, by morbidity type, Ethiopia EmONC, 2016

	Breathing difficulties	Preterm/low birth weight babies	Newborn/young infant[1] infections
	n=1,400	n=770	n=1,212
Number of morbidities reviewed			
1	26% (367)	45% (350)	14% (166)
2	74% (1,033)	54% (420)	86% (1,046)
Total number of reviewed cases	2,433	1,190	2,258
Facility type			
Hospitals/MCH specialty centres	15%	26%	16%
Health centres/clinics[2]	85%	74%	84%
Managing authority			
Public/government	96%	95%	98%
Private-for-profit	2%	3%	1%
Private-not-for-profit[3]	1%	2%	1%
EmONC classification			
CEmONC	9%	15%	10%
BEmONC	7%	10%	7%
Partially functioning[4]	84%	76%	84%
Non-EmONC[5]	0%	0%	0%

[1] Young infant refers to age less than 60 days.

[2] Includes MCH specialty clinics and higher clinics.

[3] Includes NGO, faith-based, or mission facilities.

[4] Partially functioning indicates those facilities providing some signal functions but missing at least one BEmONC signal function.

[5] Non-EmONC indicates those facilities providing no EmONC signal functions.

Birth weight and gestational age of cases

Sixty percent of the babies with breathing difficulties weighed over 2.5 kg and of the 53 percent of cases with gestational age recorded, 44 percent were term and 10 percent preterm (Table 10.5.2). This suggests a high proportion of normally grown term babies experienced breathing difficulties.

Among cases of preterm/low birth weight, one fourth (24 percent) weighed <1,500 grams and nearly all were recorded as preterm (<37 weeks). The selection criterion of <2000 grams had a positive effect on minimizing missing information on birth weight and gestational age, unlike the other cases. Sixty-nine percent of young infants less than 60 days old with infections were missing birth weight and 58 percent gestational age.

Table 10.5.2: Percent distribution of reviewed newborn morbidities according to birth weight and gestational age, by morbidity type, Ethiopia EmONC, 2016

	Breathing difficulties	Preterm/low birth weight babies	Newborn/young infant[2] infections
	n=2,433	n=1,144[1]	n=2,258
Birth weight			
Very low birth weight (<1,500 grams)	3%	24%	1%
Low birth weight (1,500-1,999 grams)	6%	76%	1%
Low birth weight (2,000-2,499 grams)	9%	0%	3%
Normal birth weight (2,500-3,999 grams)	55%	0%	24%
Macrosomic (≥4,000 grams)	5%	0%	2%
No information	23%	0%	69%
Gestational age			
Preterm (<37 weeks)	10%	97%	4%
Term (37-42 weeks)	44%	3%	37%
Post-term (>42 weeks)	0%	0%	0%
No information	47%	0%	58%

[1] 46 reviewed cases were excluded from further analysis as they did not meet the inclusion criteria of birth weight <2,000 grams.

[2] Young infant refers to age less than 60 days.

Newborns with breathing difficulties

The majority (84 percent) of the case records of neonates with breathing difficulties were from health centres and 88 percent had undergone spontaneous vaginal delivery (Table 10.5.3A page 399 in the Appendix). Overall 6 percent of the mothers had obstetric complications. There was a lack of information about neonatal resuscitation with 62 percent of health facilities and 47 percent of hospitals providing no information. Only 18 percent of the newborns in the reviewed cases received oxygen as required. Forty-four percent (n=1,070) died before discharge, 47 percent at health centres and 28 percent at hospitals.

Preterm babies of low birth weight (<2,000 grams)

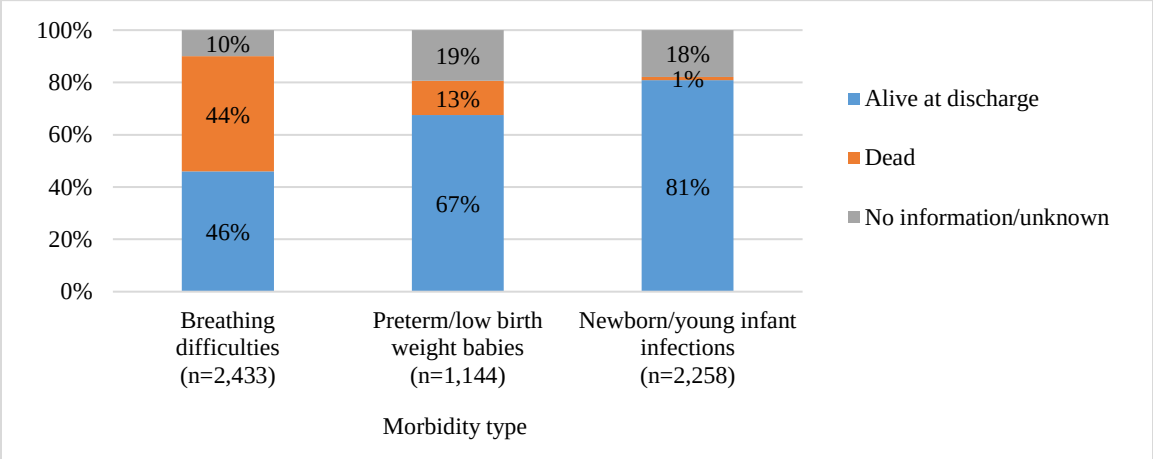
For preterm babies of low birth weight 94 percent were born at a health facility and 4 percent were born at home (Table 10.5.4A in the Appendix, page 400). Overall, only 5 percent of the mothers had received antenatal corticosteroids. Among the 45 cases selected at the private-for-profit facilities, 22 percent of the mothers had received antenatal corticosteroids. Overall, 16 percent of preterm or low birth weight babies were treated in an incubator and kangaroo mother care was initiated for 46 percent of the young infants. A daily monitoring chart was found in 55 percent of cases at hospital but just 3 percent of cases at health centres and clinics. Finally, 67 percent were alive at discharge, 13 percent died, and the outcome was unknown or unrecorded in the remaining 19 percent of cases.

Young infants with infections (<60 days of age)

For newborns and young infants with infections, the majority (86 percent) were seen in the outclient department (OPD), whilst 12 percent were in-client, and the remainder were seen in both OPD and admitted (Table 10.5.5A in the Appendix, page 401). The median age of the newborn was recorded as 23 days for health centre case reviews and 3 days for hospital newborns, implying that these were newborns with different indications for review. Temperature was recorded in 100% of cases and weight was also well recorded 78 percent of the time. However, heart rate, respiratory rate and oxygen saturation were less well recorded, 13 percent, 61 percent and 37 percent of the time, respectively. Overall, 1 percent of the newborns and young infants with infections were recorded to have died.

Figure 10.5.1 compares newborn outcomes across the three newborn morbidities reviewed.

Figure 10.5.1: Percent distribution of reviewed newborn morbidities according to outcome, by morbidity type, Ethiopia EmONC, 2016



Chapter 11: Referral System

Key Findings

- Overall, 17 percent of facilities had their own dedicated functioning ambulance (motor vehicle, motorcycle, or tricycle ambulance). Among these, reports of using the ambulance for non-emergency transport were common, for example, immunization campaigns (25 percent of facilities) and to pick up or drop off supplies (23 percent). Use of the ambulance for transporting clients home was reported by 48 percent of facilities.
- District Health Offices provided ambulance services for 62 percent of health facilities overall, and for 64 percent of health centres. However, a third of facilities assumed that clients would find referral transportation on their own.
- The three top indications requiring referral among maternity cases were: prolonged labour or CPD, haemorrhages, and hypertensive disorders. Two-thirds of newborn referral cases consisted of asphyxia/respiratory problems and low birth weight/prematurity.
- Most facilities had a person assigned to take charge of referrals, but 23 percent of facilities had no one person in charge.
- Among facilities with one or more functional ambulances on-site, only 26 percent had explicit written guidelines.
- Approximately 73 percent (55,527) of women with complications admitted at health centres were referred out to a higher level of care, suggesting the low functioning capability of health centres and their unrealized potential to manage more complications.

An integrated referral system that connects communities to facilities and these facilities to higher level facilities is fundamental to improving maternal and newborn health outcomes. A well-functioning referral system is characterized by an efficient use of transportation and management of resources, and quality clinical management of referred cases through evidence-based care, and adherence to practices delineated in national referral guidelines, such as using referral slips, advance calls, medical escorts, providing feedback, and documenting the process for monitoring and evaluation purposes.

The referral module asked questions about the availability of modes of communication (described in Chapter 6 on facility infrastructure) and transport, implementation, administrative management and monitoring of the system, maintenance and repair of vehicles, and driver training. A series of questions distinguished between practices or characteristics of facilities that referred clients to a higher level of care (referrals out) and similar practices for facilities that received clients from lower levels of care (referrals in). Many facilities answered both sets of questions. Additional information on the topic of referral was also captured at woreda, zonal and regional levels of the health system and can be found in Chapter 13.

11.1 Availability of emergency services 24/7 and distance to nearest facility with obstetric surgery or specialized newborn care

Availability of emergency services 24/7

To set the context for referral, facility representatives were asked if they provided emergency maternal or newborn care 24 hours a day and 7 days a week, and almost all replied yes. Table 11.1.1 shows that 99 and 98 percent of facilities at national level said that they provided 24/7 obstetric or newborn care services, respectively.

Table 11.1.1: Percent of facilities that provided obstetric and newborn care 24/7 and whether staff on call can reach the facility within 30 minutes, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Provides obstetric care 24/7	Provides newborn care 24/7	Staff on call can reach facility within 30 min
National	3,804	99%	98%	80%
Region				
Tigray	255	100%	99%	92%
Afar	77	97%	97%	34%
Amhara	876	100%	99%	86%
Oromia	1,405	100%	99%	90%
Somali	161	96%	88%	70%
Benishangul-Gumuz	43	100%	100%	84%
SNNP	773	99%	97%	62%
Gambella	27	100%	100%	74%
Harari	15	93%	73%	67%
Addis Ababa	151	100%	99%	64%
Dire Dawa	21	100%	38%	38%
Facility type				
Referral/specialized hospitals	30	100%	100%	93%
General hospitals	103	99%	97%	93%
Primary hospitals	160	99%	96%	89%
MCH specialty centres	23	96%	96%	83%
Health centres	3,459	99%	98%	79%
MCH specialty clinics	16	94%	81%	69%
Higher clinics	13	92%	85%	85%
Managing authority				
Public/government	3,662	100%	98%	80%
Private-for-profit	83	98%	89%	88%
Private-not-for-profit[1]	59	95%	95%	73%
Location				
Urban	1,497	99%	97%	79%
Rural	2,307	99%	98%	80%

[1] Includes NGO, faith-based, or mission facilities.

The exceptions were a few facilities in Afar, Somali, SNNP, and Harari that did not provide 24/7 obstetric services. Provision of 24/7 newborn care services was as low as 38 percent among facilities in Dire Dawa and as high as 100 percent in Benishangul-Gumuz and Gambella. There was no difference in 24/7 service provision between rural and urban facilities for either obstetric or newborn care.

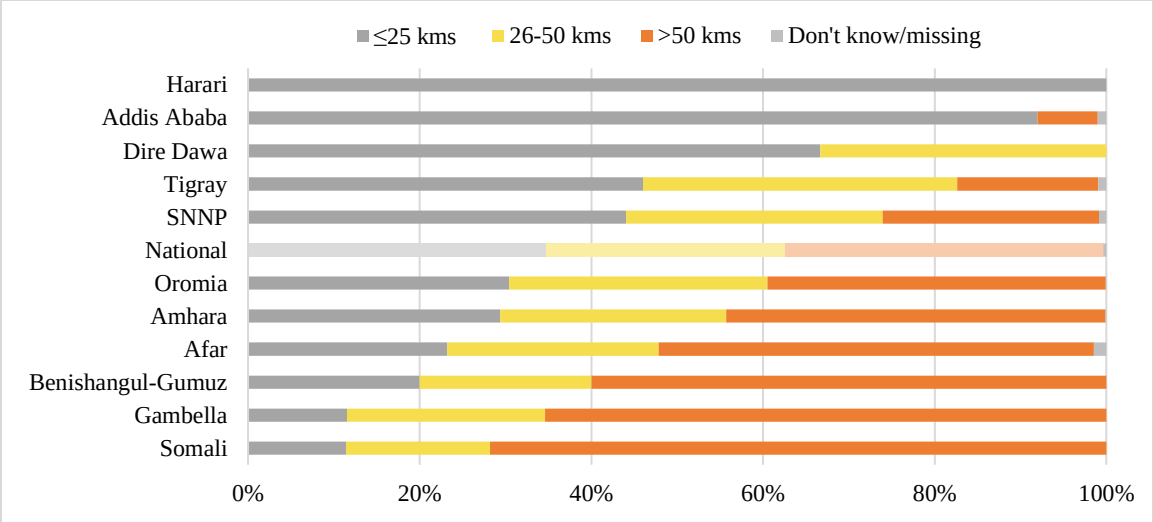
In 80 percent of facilities on-call staff could reach the facility within 30 minutes. This percentage was much lower in Afar region (34 percent) while more than 84 percent of facilities in Tigray, Amhara, Oromia, and Benishangul-Gumuz regions had staff on-call who could reach the facility within a half hour. Access for staff on-call was higher in private-for-profit facilities than government or private-not-for-profit facilities.

Distance and time to the nearest facilities with specialized maternal and newborn care

Although most facilities reported that they provided 24/7 emergency services, in many cases those services were limited. Two scenarios were posed to the facility in-charge regarding how far they would have to travel to reach the nearest facility with obstetric surgery and to the nearest specialized newborn care unit. Distance was defined in kilometres (km) and in minutes. For this analysis, we present distance and time among those facilities that did not provide obstetric surgery in the last 3 months or that had not provided all the EmNeC signal functions in the last 3 months. Tables 11.1.2A through 11.1.5A in the Appendix pages 402 through 405 show how far facilities were from the nearest referral facilities with the specialized obstetric and newborn services. Hospitals and MCH specialty centres were looked at separately from health centres and clinics.

Overall, among the 63 hospitals/specialty centres that did not provide obstetric surgery in the last 3 months, 30 percent were 25 km or less from the nearest facility that did provide surgery and 37 percent were more than 50 kms. Figure 11.1.1 shows the 3,468 health centres and clinics that did not provide obstetric surgery. Thirty-five percent were located within 25 km of an obstetric surgical centre while 37 percent were more than 50 km. In Somali, 72 percent of health centres and clinics were farther than 50 km to the nearest facility that provided obstetric surgery. Not surprisingly, urban facilities were closer to facilities with obstetric surgery than rural facilities.

Figure 11.1.1: Percent distribution of health centres/clinics that did not provide obstetric surgery in the last 3 months according to distance to nearest facility that provided obstetric surgery, by region, Ethiopia EmONC, 2016



Distance to the nearest facility with specialized newborn care was similar. Twenty-two percent of the 204 hospitals/specialty centres that did not provide all EmNeC signal functions were more than 50 kms from a facility with specialized newborn services while 36 percent of health centres and clinics were. Again, women in Somali faced more severe challenges accessing specialized newborn care than other regions: 70 percent of health centres and clinics were more than 50 km from a special newborn care unit.

11.2 Availability of means of transportation

Availability of ambulances and their equipment

Because of distance and the geographical context of specialized care, access to transportation is often the first concern. Without transportation, referral cannot take place, diagnosis and care are delayed, or worse, people cease to seek services. Facilities require a means of transporting clients as well as for the smooth management of logistics such as the procurement of supplies or drugs, for outreach or campaigns in the community, to conduct coaching or supervision, or to attend meetings. And if there is no transport on-site, a facility requires some mode of communication to arrange for transport. The availability of different modes of communication was discussed in Chapter 6.

Table 11.2.1 shows the number of ambulances in each region by combining each health facility's self-reported number of functional motorized ambulances on-site and the woreda health officer's report of how many public ambulances the woreda had. We then calculated the size of the population that each ambulance served on average: served by public ambulances only, and by public and privately managed ambulances. Of the 1,417 ambulances reported only 121 were managed by private-for-profit and not-for-profit facilities. Nationally, there was one public ambulance for every 71,000 population but when all ambulances are considered there was one public or private ambulance for every 64,900 population. Addis Ababa appears

to be the area that most benefits from the existence of private ambulances: while there was only one public ambulance for every 111,700 population, that drops to 37,600 people when considering both public and private ambulances. Globally, the ratio tends to vary widely depending on many factors, including transportation strategy (are ambulances used for convalescent vs. urgent vs. true emergencies?), the tiered response system, availability of training, time of day, and usage patterns. Generally urban ambulances tend to serve a larger population than ambulances located in rural areas.

Table 11.2.1 Ratio of functioning motorized vehicle ambulances to population, by region, Ethiopia EmONC, 2016

	Population	Number of ambulances at private[1] facilities	Number of public ambulances reported by woreda health office[2]	Total ambulances (public and private)	Ratio of public ambulances to population	Ratio of public and private ambulances to population
National	92,085,000	121	1,304	1,417	1:71,053	1: 64,986
Region						
Tigray	5,151,000	4	118	122	1: 43,652	1:42,221
Afar	1,768,000	4	39	43	1:45,333	1: 41,116
Amhara	20,771,000	12	280	292	1:74,182	1: 71,133
Oromia	34,575,000	19	431	450	1:80,220	1: 76,833
Somali	5,599,000	5	103	108	1:54,359	1: 51,842
B-Gumuz	1,035,000	2	30	32	1:34,500	1: 32,344
SNNP	18,720,000	10	245	255	1:76,408	1: 73,411
Gambella	422,000	1	12	13	1:35,167	1: 32,461
Harari	238,000	3	5	8	1:47,600	1: 29,750
Addis Ababa	3,353,000	59	30	89	1:111,767	1:37,674
Dire Dawa	453,000	2	11	13	1:41,182	1:34,846

[1] Includes private-for-profit and private-not-for-profit facilities. Private-not-for-profit includes NGO, faith-based and mission facilities.

[2] Includes ambulances placed at public health facilities and at woreda health offices (not all woreda offices were visited as part of the survey, so this slightly underestimates the total). For Addis Ababa and Dire Dawa, we used only the number of ambulances reported on-site at public facilities for these regions.

Table 11.2.2 shows the percentage of facilities with some type of ambulance on-site, either a motor vehicle ambulance or a motorcycle or tricycle ambulance. The question to the facility manager referred to ambulances on-site, therefore, these figures do not capture the ambulances stationed at district health offices and do not accurately measure the overall availability of ambulances. See Chapter 13 for information of ambulances at the woreda level.

Table 11.2.2: Percent of facilities with on-site ambulance transport and whether it was functional or needed repair, by type of ambulance, region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	At least one motor vehicle ambulance		At least one motorcycle/tricycle ambulance		Has at least one type of functional motorized ambulance[1]
		Available, functional	Available, needs repair	Available, functional	Available, needs repair	
National	3,804	17%	4%	4%	3%	17%
Region						
Tigray	255	20%	5%	5%	2%	20%
Afar	77	40%	8%	10%	6%	40%
Amhara	876	16%	5%	6%	5%	17%
Oromia	1,405	9%	2%	1%	1%	10%
Somali	161	57%	14%	14%	5%	58%
Benishangul-Gumuz	43	70%	26%	37%	33%	74%
SNNP	773	10%	2%	3%	2%	11%
Gambella	27	26%	7%	4%	0%	26%
Harari	15	53%	0%	0%	0%	53%
Addis Ababa	151	36%	6%	3%	0%	36%
Dire Dawa	21	62%	0%	10%	0%	62%
Facility type						
Referral/specialized hospitals	30	83%	23%	10%	0%	83%
General hospitals	103	79%	17%	11%	4%	81%
Primary hospitals	160	55%	10%	8%	4%	56%
MCH specialty centres	23	87%	4%	0%	0%	87%
Health centres	3,459	12%	3%	4%	3%	13%
MCH specialty clinics	16	25%	0%	0%	0%	25%
Higher clinics	13	31%	0%	0%	0%	31%
Managing authority						
Public/government	3,662	15%	4%	4%	3%	16%
Private-for-profit	83	69%	5%	5%	0%	69%
Private-not-for-profit[2]	59	54%	5%	5%	0%	58%
Location						
Urban	1,497	29%	6%	7%	4%	30%
Rural	2,307	9%	2%	2%	2%	9%

[1] Facility has either a motor vehicle ambulance, a motorcycle or tricycle ambulance, or another type of motorized ambulance. Two cases qualified as ambulances under the category of "another" type of motorized ambulance for a total of 663 facilities.

[2] Includes NGO, faith-based, or mission facilities.

Only 17 percent of all facilities reported that they had at least one type of functioning motorized ambulance on-site while 3-4 percent had ambulances on-site that required repair. Seventeen percent reported a motor vehicle ambulance and 4 percent a motorcycle or tricycle ambulance. Benishangul-Gumuz was the best equipped region (74 percent of facilities) and Oromia and SNNP were the regions least well supplied with ambulances on-site (8-9 percent of facilities). Regarding facility types, hospitals were more likely than mid-level facilities to have an ambulance on-site: 87 percent of MCH specialty centres had an ambulance on-site but only 13 percent of health centres had one. Government facilities had a smaller percentage of facilities reporting at least one motorized ambulance on-site (16 percent) than the two private sector groups (58-69 percent). Thirty percent of urban facilities and only 9 percent of rural facilities reported a motorized ambulance. It appears that precisely those facilities in locations that will be most in need of transportation for referral were those with the lowest percentages of ambulance ownership – rural facilities and government health centres.

A well-equipped ambulance can make a difference in the client's condition on arrival. Table 11.2.3A in the Appendix (page 406) presents the percentage of facilities with a functioning motorized ambulance on-site according to the type of equipment it had. Nine out of 10 facilities with an ambulance reported that the ambulance had a stretcher, 44 percent an IV stand, 34 percent a dedicated communication device, 34 percent an emergency drug and supply kit, and 31 percent oxygen. Only about a quarter of facilities had ambulances with protective wear for attendants, pressure dressings, or ambu bags and masks for adults or newborns.

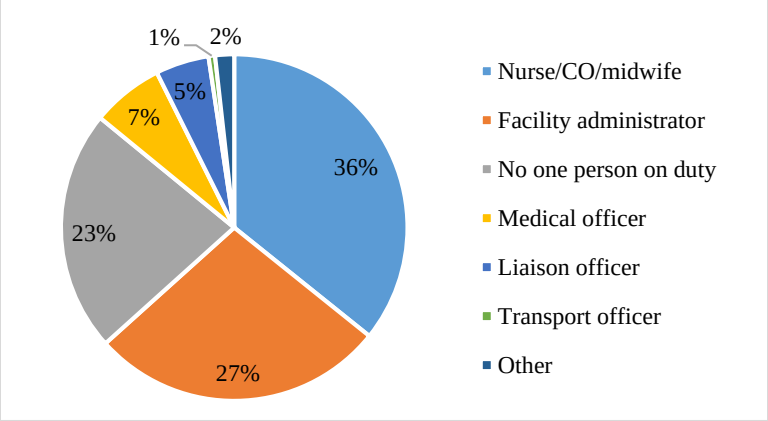
Other means of transport

In the absence of an ambulance, other means of transport can also be used in emergencies. Table 11.2.4A in the Appendix (page 408) shows the percentage of facilities with non-ambulance transportation options. The most frequently reported type of non-ambulance transport was a motorcycle or tricycle at 13 percent of facilities, followed by motor vehicles at 3 percent. Bicycles and other transport mechanisms (not shown) were mentioned by a very small number of facilities.

11.3 Facility accountability around the use of transport

Facilities manage their emergency transport systems in different ways, adapting to facility specific resources and conditions while attempting to comply with standards or norms. The percent distribution of facilities with a staff member in charge of managing or organizing emergency transport is indicated in Table 11.3.1A in the Appendix on page 410 and Figure 11.3.1. Nationally, 36 percent of facilities had nurses, clinical officers, or midwives in charge of managing or organizing emergency transport, followed by 28 percent that had a facility administer playing this role. Surprisingly, 23 percent of facilities had no one in charge of organizing the emergency transport system in their facility. Having a liaison or transport officer in the facility to manage emergency transportation was very uncommon (5 and 1 percent, respectively). However, the person who was in charge of emergency transport varied widely by facility type. More than three-fourths of referral hospitals had a liaison officer in charge to manage emergency transport while general and primary hospitals also employed liaison officers but not at the level of the referral/specialized hospitals (39 and 27 percent, respectively). Health centres and clinics rarely reported a liaison officer.

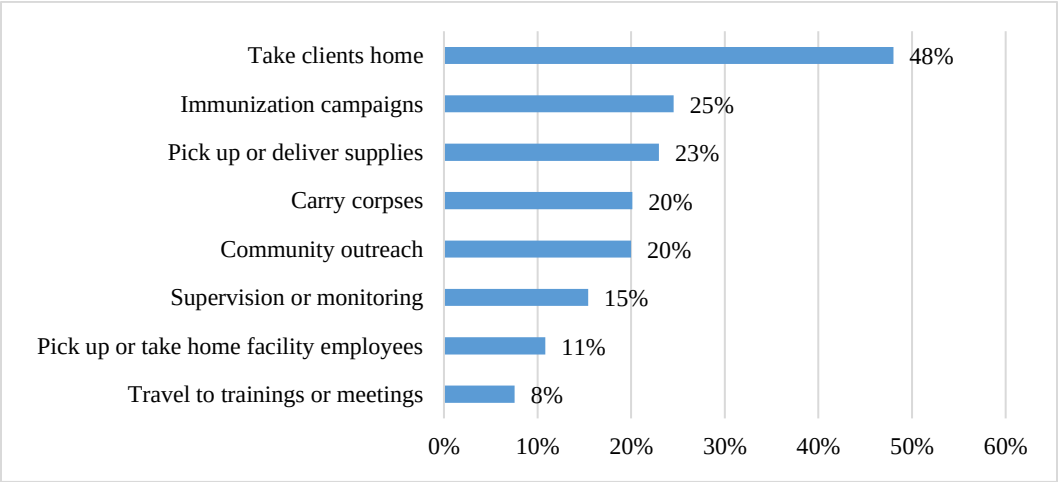
Figure 11.3.1: Percent distribution of facilities according to staff member in charge of managing the emergency transport system, Ethiopia EmONC, 2016



To improve accountability and system reliability, guidelines for ambulance operation and management can establish performance expectations. The availability of written ambulance guidelines is reported on Table 11.3.2A (Appendix, page 411). Twenty-six percent of 661 facilities with at least one functional ambulance had written guidelines, of which 44 percent were observed. Twenty-nine percent of these written guidelines were produced by the facility itself.

To explore the extent to which ambulances were used for purposes other than emergency client transport, facilities with ambulances were asked if the ambulance was used for eight specific purposes (Figure 11.3.2 and Table 11.3.3A in the Appendix on page 412). Almost half (48 percent) of facilities said that they use the ambulance to take clients home, 25 percent for conducting immunization campaigns, 23 percent to pick up or distribute supplies, 20 percent for carry corpses, and 20 percent for outreach. The practice of taking clients home was highest among the health centres and clinics and higher in rural areas than in urban.

Figure 11.3.2: Percent of facilities with a functional motorized ambulance that used the ambulance for non-emergency transport purposes, Ethiopia EmONC, 2016

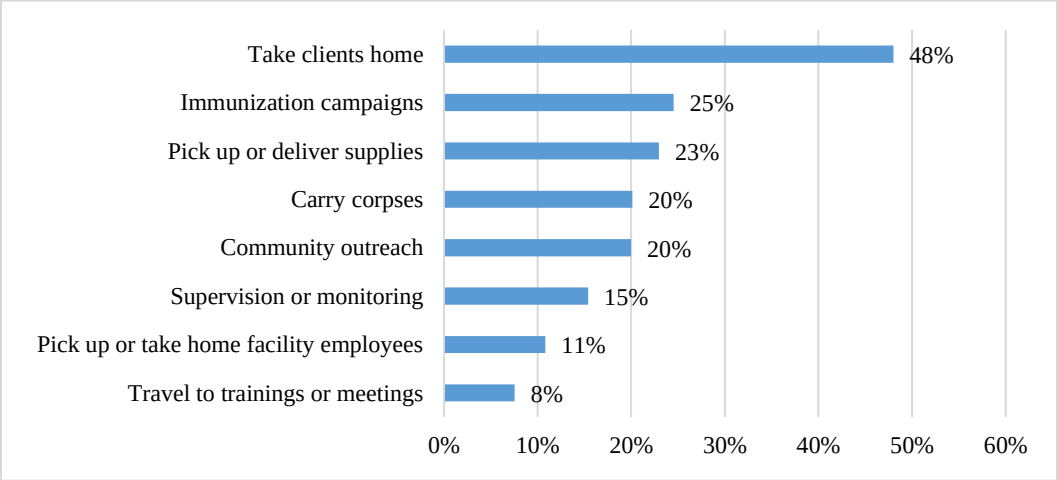


11.4 Management and policies for clients referred out and referred in

A series of questions explored how facilities handle the referral of clients to a higher level and another, overlapping, series asked how facilities handle clients who were referred in. Most facilities answered both sets of questions, but more facilities referred clients "out" (n=3,740) than received clients who were referred "in" (n=3,591) from lower levels. When the topics overlap, we compare the sending facilities' responses with the receiving facilities' responses.

Facilities understandably used different transportation strategies when they referred clients to a higher level of care. Figure 11.4.1 and Table 11.4.1A in the Appendix (page 413) examine how facilities routinely sent a maternity client to another facility. Because facilities might use more than one strategy, multiple responses were possible. The most frequent mechanism was to use the vehicle at the District Health Office (DHO) (62 percent), followed by making a call to a dispatch centre (31 percent). A quarter of the facilities replied that they had their own means of transport, but 33 percent of facilities said that clients had to assume the responsibility of finding their own transportation. Eighty-one percent of facilities in SNNP and 73 percent in Oromia regions used vehicles from the DHOs. Benishangul-Gumuz (74 percent) and Dire Dawa (62 percent) had the highest percentages of facilities that relied on their own means of transportation for emergency cases. Of all facility types, health centres were the most reliant on DHOs for a vehicle. Not surprisingly, strategies varied by whether the facility was public or private. The latter were more likely to depend on their own means of transportation than were public facilities. But even private facilities to some extent relied on DHOs and dispatch centres.

Figure 11.4.1: Percent of facilities that referred out that used different transport strategies, Ethiopia EmONC, 2016



Common indications for maternal and newborn referral and overall magnitude of maternity referral

The data collectors inquired at each facility that sent referrals to a higher level about the three most common obstetric indications for referral (Table 11.4.2A in the Appendix, page 414). The responses were: prolonged labour/CPD (80 percent mentioned as one of the top three indications for referral), followed by haemorrhage (50 percent), and hypertensive disorders of pregnancy (4l percent). Ninety percent of facilities in Benishangul-Gumuz and 85 percent in Gambella reported that prolonged labour/CPD was the leading

obstetric complication requiring referrals. Very few facilities in Dire Dawa (5 percent) mentioned haemorrhage as a common indication for referral. Primary hospitals and higher clinics reported haemorrhage as the most common maternal complication requiring referral. Complications like mal-presentations, foetal distress, premature rupture of membrane, and preterm labour were mentioned by more than 10 percent of facilities.

The question was modified for newborns as it solicited the single most common newborn complication (Table 11.4.3A in the Appendix on page 416). The most common newborn complication requiring referral to higher levels was asphyxia (22 percent) followed by low birth weight (18 percent) and prematurity (15 percent). Nearly 60 percent of facilities in Dire Dawa reported that asphyxia was the leading newborn complication requiring referrals, but only 4 percent of facilities in Gambella reported asphyxia. Interestingly, 46 percent of the facilities in Gambella said they never refer newborns. Facilities in Harari region reported the highest percentage where low birth weight (67 percent) was the main reason for referral. Furthermore, 28 percent of facilities in Tigray region reported prematurity as a main reason for referral.

During the exercise to collect the 12 months of services statistics – enumerating the number of deliveries, complications and deaths – the data collectors also recorded how many maternal and newborn referrals out were made. This registering of referral cases did not, however, examine referrals by type of complication. Finally, if both a mother and her newborn required referral, the referral was counted as a maternal referral.

As shown in Table 11.4.4, of the 1.9 million deliveries registered, almost 4 percent were referred out due to maternal complications. Less than 1 percent of deliveries were referred exclusively for newborn complications. Of the 200,892 women registered as having direct or indirect complications, 69,605 women (35 percent) were referred to a higher level. This percentage rises to 73 percent of complications documented at health centres and was as low as 1 percent at private-for-profit facilities; the former suggests that health workers in health centres were not prepared to treat most maternal complications. Unfortunately, the assessment did not enumerate all newborn complications and thus, we cannot say what percentage of newborn complications were referred out. These numbers and percentages, although precise, may not completely accurately describe the dynamic and complex situation of referral. It is possible that a woman was recorded as a referral out without having been admitted, i.e. recorded in the referral register but not in the labour and delivery register. Related to this, a woman could appear in the registers and logbooks of more than one facility and be counted twice, thus, overestimating the overall number of complications. During training, the guidance to the data collectors was to count a woman with a complication if she was referred out, ***only if*** she had received treatment or stabilization prior to the referral. This level of detail was not always easy to obtain from registers.

Table 11.4.4: Percent of deliveries and women with complications who were referred out due to maternal or newborn indications during the 12 months of 2015, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Deliveries	Women with direct or indirect complications	Referrals out due to maternal indications			Referrals out due to newborn indications[1]	
	n	n	n	% of deliveries	% women with compli-cations	n	% of deliveries
National	1,924,330	200,892	69,605	4%	35%	6,231	0.3%
Region							
Tigray	113,425	19,281	7,110	6%	37%	701	0.6%
Afar	7,678	1,344	324	4%	24%	24	0.3%
Amhara	386,131	41,218	13,784	4%	33%	1,194	0.3%
Oromia	844,287	55,419	21,378	3%	39%	1,959	0.2%
Somali	22,036	3,899	641	3%	16%	67	0.3%
Benishangul-Gumuz	12,288	2,429	511	4%	21%	40	0.3%
SNNP	417,697	31,197	9,657	2%	31%	756	0.2%
Gambella	3,383	451	18	1%	4%	2	0.1%
Harari	7,579	2,635	121	2%	5%	9	0.1%
Addis Ababa	101,401	40,451	15,502	15%	38%	1,438	1.4%
Dire Dawa	8,425	2,568	559	7%	22%	41	0.5%
Facility type							
Referral/specialized hospitals	103,331	43,994	3,312	3%	8%	385	0.4%
General hospitals	127,099	44,844	1,080	1%	2%	336	0.3%
Primary hospitals	104,624	21,625	3,533	3%	16%	515	0.5%
MCH specialty centres	17,628	5,199	285	2%	5%	50	0.3%
Health centres	1,565,273	84,357	61,292	4%	73%	4,926	0.3%
MCH specialty clinics	3,304	696	63	2%	9%	17	0.5%
Higher clinics	3,071	177	40	1%	23%	2	0.1%
Managing authority							
Public/government	1,861,793	184,780	68,109	4%	37%	6,040	0.3%
Private-for-profit	28,489	10,350	93	0%	1%	127	0.4%
Private-not-for-profit[2]	34,048	5,762	1,403	4%	24%	64	0.2%
Location							
Urban	971,504	170,285	47,915	5%	28%	4,240	0.4%
Rural	952,826	30,607	21,690	2%	71%	1,991	0.2%

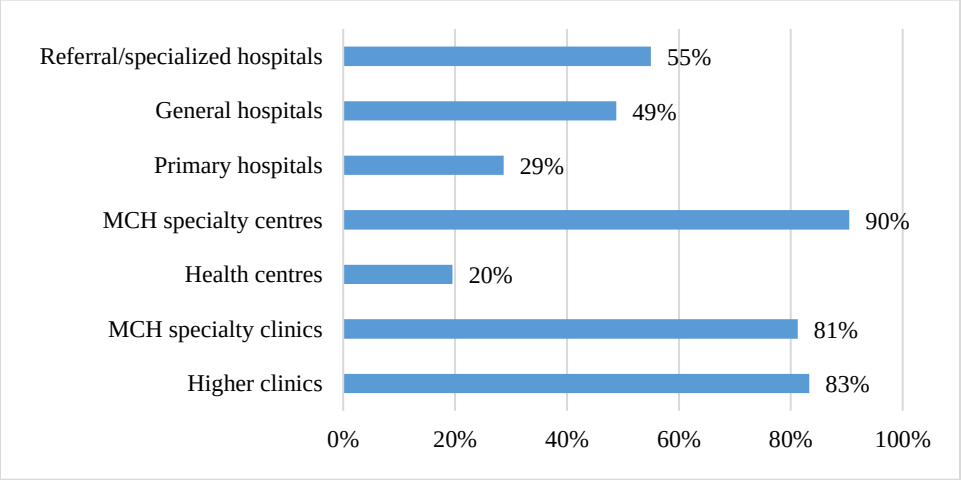
[1] If referral was made for both mother and newborn, the case was counted only as a maternal referral.

[2] Includes NGO, faith-based, or mission facilities.

Fees required prior to referral out and prior to treatment after referral in

The survey assessed whether facilities required certain fees for maternal and newborn clients who were referred out or in. Among facilities that referred clients to a higher level, 22 percent required clients to clear their expenses prior to referral. The percentages were higher among the private facilities than among the public facilities, but as the level of care increased, more facilities required payment (Table 11.4.5A in the Appendix on page 418 and Figure 11.4.2).

Figure 11.4.2: Percent of facilities that referred out where expenses had to be cleared prior to referral out, by facility type, Ethiopia EmONC, 2016



However, the percentage of facilities receiving referrals that required payment prior to treatment was small; almost 4 percent of facilities required payment prior to treatment for women who were referred in and 6 percent of facilities wanted clients to clear their expenses for newborns prior to treatment.

Table 11.4.6A (in the Appendix on page 419) describes the percentage of facilities that required payment for transportation or for fuel if emergency referral to a higher level of care were required. The question was asked for certain types of clients. Among facilities that referred clients to a higher level, 10 percent required fees for transportation or fuel for peripartum women in labour or postpartum women, 9 percent required transport fees from families for newborns with complications, and 10 percent required fees for the family of a sick neonate. In contrast, 34 percent of facilities requested transport fees for sick adults (illnesses unrelated to pregnancy).

Support for families of referred maternity clients

Table 11.4.7A (Appendix, page 420) shows percentages of facilities that provided different types of support to families who accompanied referred maternity clients. Accordingly, 29 percent of facilities provided lodging services, 26 percent of facilities provided food for companions of the referred clients, but only 1 percent provided other types of support such as free medications. Facility-based food support for companions was highest in Amhara region (37 percent of facilities). Lodging support was highest in Benishangul-Gumuz (59 percent), followed by Tigray region (57 percent). Government facilities were more

likely to provide food support to the families of referred maternity clients than were private facilities; whereas, private-not-for-profit facilties were the most likelty to provide lodging.

Availability of guidelines for pre-referral and definitive treatment

A critical component to a well-functioning referral system are guidelines both for providers who send referrals (called pre-referral guidelines) and for providers who receive referrals (called definitive treatment guidelines). Guidelines help organize the referral system and standardize clinical care; positive outcomes are more likely if clients are stabilized prior to referral, and when referral and hand-over follow protocol.

Table 11.4.8 shows the percent distribution of facilities according to the existence of explicit written guidelines for pre-referral (referring out) and definitive treatment (referral in), and whether the data collector could observe the guideline. Accordingly, 24 percent of facilities had observable pre-referral written guidelines and an additional 17 percent said they had pre-referral written guidelines but these were not observed. In receiving facilities, 29 percent of facilities had observable written guidelines for definitive treatment and an additional 19 percent of the facilities said that they had guidelines but the data collectors could not or did not observe them. The highest percentage of facilities with observed pre-referral written guidelines were found in Tigray (52 percent) and Addis Ababa (39 percent). The highest percentage of facilities with observed written guidelines for definitive treatment were also found in Tigray (70 percent) and Addis Ababa regions (54 percent). The differences across managing authority were not large; they were slightly larger between urban (with higher rates of observed guidelines) and rural facilities (lower rates).

Table 11.4.8: Percent distribution of facilities that referred out and received referrals according to existence and observation of written guidelines for pre-referral and definitive management of obstetric and newborn complications, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Facilities that referred out				Facilities that received referrals			
	Number of facilities that referred out	Written guidelines for pre-referral management			Number of facilities that received referrals	Written guidelines for definitive management		
		Had & observed	Had & not observed	Did not have		Had & observed	Had & not observed	Did not have
National	3,740	24%	17%	60%	3,591	29%	20%	51%
Region								
Tigray	251	52%	26%	22%	245	70%	22%	8%
Afar	76	16%	5%	79%	61	15%	8%	77%
Amhara	867	21%	18%	62%	846	25%	24%	51%
Oromia	1,386	25%	14%	61%	1,318	29%	18%	53%
Somali	154	7%	9%	84%	147	8%	10%	82%
Benishangul-Gumuz	43	19%	28%	53%	41	29%	29%	42%
SNNP	762	18%	18%	64%	752	23%	19%	58%
Gambella	26	4%	8%	88%	17	18%	0%	82%
Harari	15	27%	13%	60%	14	21%	14%	64%
Addis Ababa	139	39%	27%	34%	129	54%	20%	26%
Dire Dawa	21	10%	5%	86%	21	19%	19%	62%
Facility type								
Referral/specialized hospitals	20	30%	45%	25%	29	59%	21%	21%
General hospitals	84	45%	18%	37%	95	54%	22%	24%
Primary hospitals	150	34%	24%	42%	155	44%	21%	35%
MCH specialty centres	21	33%	19%	48%	20	40%	25%	35%
Health centres	3,437	23%	16%	61%	3,274	28%	19%	53%
MCH specialty clinics	16	13%	31%	56%	10	10%	40%	50%
Higher clinics	12	8%	25%	67%	8	0%	25%	75%
Managing authority								
Public/government	3,615	24%	16%	60%	3,474	29%	19%	51%
Private-for-profit	68	19%	16%	65%	67	30%	25%	45%
Private-not-for-profit[1]	57	23%	32%	46%	50	32%	16%	52%
Location								
Urban	1,449	29%	21%	50%	1,396	36%	21%	42%
Rural	2,291	20%	14%	66%	2,195	25%	18%	57%

[1] Includes NGO, faith-based, or mission facilities.

Calling ahead to provide notice of in-coming referral

Advance notification of an in-coming referral helps providers prepare their response – such as alert the surgeon and anaesthetist, inform the blood bank, or simply to ensure there is physical space. The distribution of facilities that refer out according to how often they alert a receiving facility and what communication mechanisms are used can be seen in Table 11.4.9A on page 421 in the Appendix. Sixty-five percent of facilities admitted that they never called ahead to alert their professional colleagues of a referral client's arrival. Of the facilities that did alert neighbouring facilities when they made a referral, 95 percent used phone or radio channels to communicate. Alerting the referral facility was more widely practiced among Addis Ababa facilities (83 percent usually informed) than facilities in other regions. In addition, 67 percent of MCH specialty centres, 50 percent of general hospitals, and 45 percent of referral/ specialized hospitals usually practiced alerting receiving facilities prior to sending a client. Nearly 50 percent of private-for-profit facilities usually alerted receiving facilities before the referral, but this practice was limited to only 14 percent of government or public facilities.

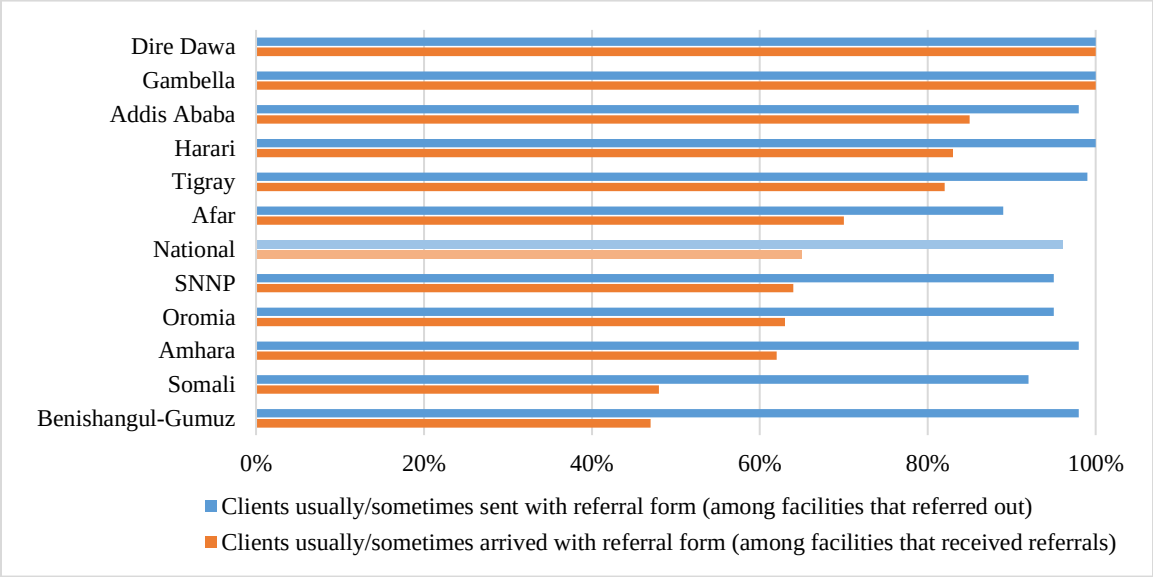
Among the 3,591 facilities that received referred clients from another facility, only 29 percent had a formal triage system to assess the client's condition on arrival (Table 11.4.10A in the Appendix, page 422). High percentages of facilities in Addis Ababa (80 percent), followed by Benishangul-Gumuz (56 percent), and Somali (33 percent) regions had a triage system for referred in cases. Referral hospitals were the most likely to have triage and health centres the least likely to have this system, 90 and 24 percent, respectively.

More than half (51 percent) of the facilities reported that they never received advance notifications from sending facilities while 22 percent reported that they "usually" received such notification from the referring facilities. Sixty-seven percent of facilities in Dire Dawa and 61 percent in Oromia regions never received notification in advance from the referring facilities. Forty-nine percent of facilities in Benishangul-Gumuz and 44 percent in Tigray regions "usually" received notifications in advance from the referring facilities. Forty-five percent of MCH specialty centres reported that they usually received advance notification of an in-coming referral. Among facilities that received calls in advance and took actions, 90 percent reported that they notified appropriate health personnel, 74 percent prepared space for admission, 51 percent alerted pharmacies, and 8 percent prepared the operation theatre (OT).

Using referral forms and providing feedback

Among the 3,740 facilities that referred clients to another facility, 96 percent reported that they usually or sometimes used referral forms (see Figure 11.4.3 and Table 11.4.11A in the Appendix on page 424). Sending clients with a referral form was the normative practice for most facilities regardless of type of facility, managing authority or location. Afar region and MCH specialty clinics lagged behind to a small degree.

Figure 11.4.3: Percent of facilities that referred out and received referrals according to use of referral form, by region, Ethiopia EmONC, 2016



In contrast with the sending facilities' self-reports, however, receiving facilities reported a lower use of referral forms; only 65 percent of facilities said that clients who arrived from another facility usually or sometimes came with a referral form. The greatest reporting discrepancies in referral form usage (between facilities that referred out and those that received in) were found in Somali and Benishangul-Gumuz. Client arrival with a form was much lower than the report from sending facilities.

A little more than half of the facilities (52 percent) reported that they used a standardized referral form. In Gambella, however, only 27 percent of facilities used a standardized form.

Receiving feedback about client outcomes or conditions was not a common practice – 74 percent of facilities said that they never or rarely received feedback. However, facilities in Addis Ababa, Tigray, Benishangul-Gumuz, and Dire Dawa reported levels of feedback higher than the national average.

Referral from health extension workers was widespread – 87 percent of facilities received women and newborns from these community workers. Health centres and primary hospitals were the most likely facilities to receive referrals from the community. Only 10 percent of private-for-profit facilities received referrals from health extension workers.

Medical escort

Fifty-two percent of facilities reported that they "usually" sent medical personnel to accompany a client being referred while most facilities (24 percent) sent medical personal "sometimes" (Table 11.4.12A in the Appendix page 426). Among the facilities that sent medical personnel to accompany the referred client, midwives (84 percent) were the most common escort, followed by nurses (69 percent), and health officers (25 percent). Regionally, one in five or more referred clients "never" had a medical escort in Afar, Harari, Addis Ababa, and Dire Dawa. In terms of facility types, about two-thirds of hospitals and MCH specialty

centres “usually” sent medical escorts; this percentage was half or slightly lower among health centres and clinics. Moreover, 19 percent of facilities located in rural areas “never” sent medical personnel to accompany referred clients.

Reporting

Among facilities that referred clients to a higher level, 65 percent were required to report monthly or quarterly the number of clients referred out (Table 11.4.13A in the Appendix, page 428). Similarly, among facilities that received referrals, 42 percent were required to report how many referrals they received (Table 11.4.14A, page 429). Logbooks exclusively for referral out existed in 53 percent of facilities. Staff reportedly registered referral status in labour and delivery or maternity ward registers in 53 percent of the facilities who referred out and in 23 percent of the facilities who received referrals. The mean number of clients referred out to a higher level for obstetric and newborn care services were 4 and 2 per month, respectively, whereas among facilities that received referrals the monthly averages were 17 and 3, respectively (Figures 11.4.4 and 11.4.5). The number of referrals in exceeded the number of referrals out in all facilities except higher clinics.

Figure 11.4.4: Average number of maternal referrals out and in per month in hospitals/MCH specialty centres, by facility type, Ethiopia EmONC, 2016

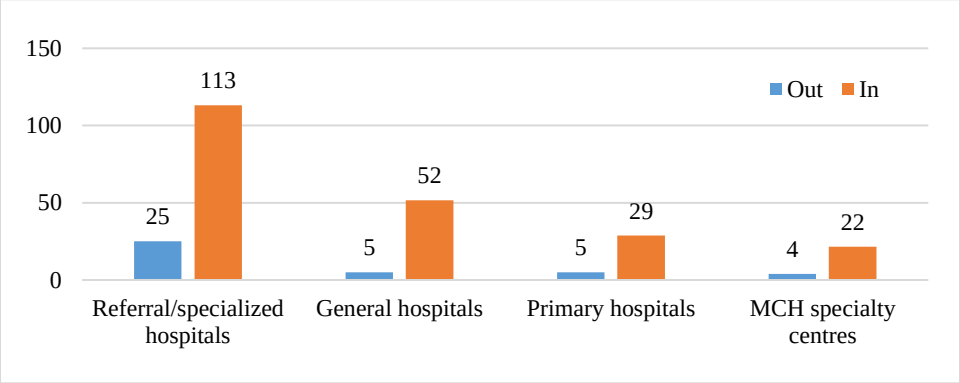
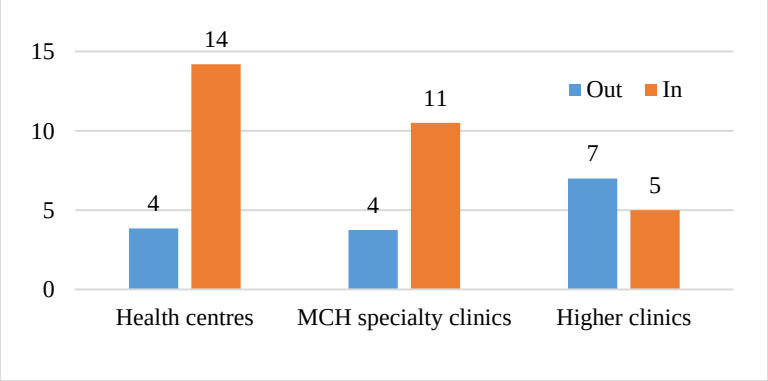


Figure 11.4.5: Average number of maternal referrals out and in per month in health centres/clinics, by facility type, Ethiopia EmONC, 2016



11.5 Management of vehicles and drivers

Problems with vehicle maintenance and frequent accidents often plague medical emergency transport systems. Supporting drivers with training in simple maintenance and repair, as well as first aid, can save lives and financial resources.

Among the 1,285 facilities with their own functional motorized transport, 51 percent had a routine preventive maintenance schedule for their vehicle(s). Seventy-two percent of facilities had sufficient fuel available on the day of the survey to transport clients had it been needed and 70 percent had sufficient funds for maintenance (Table 11.5.1). The primary reasons for insufficient funds included waiting for government funds (45 percent) and funds had not been planned (42 percent). Figure 11.5.1 shows differences across the regions.

Figure 11.5.1: Number of facilities with their own functional motorized transport, with access to resources for fuel and maintenance, and with a driver on staff, by region, Ethiopia EmONC, 2016

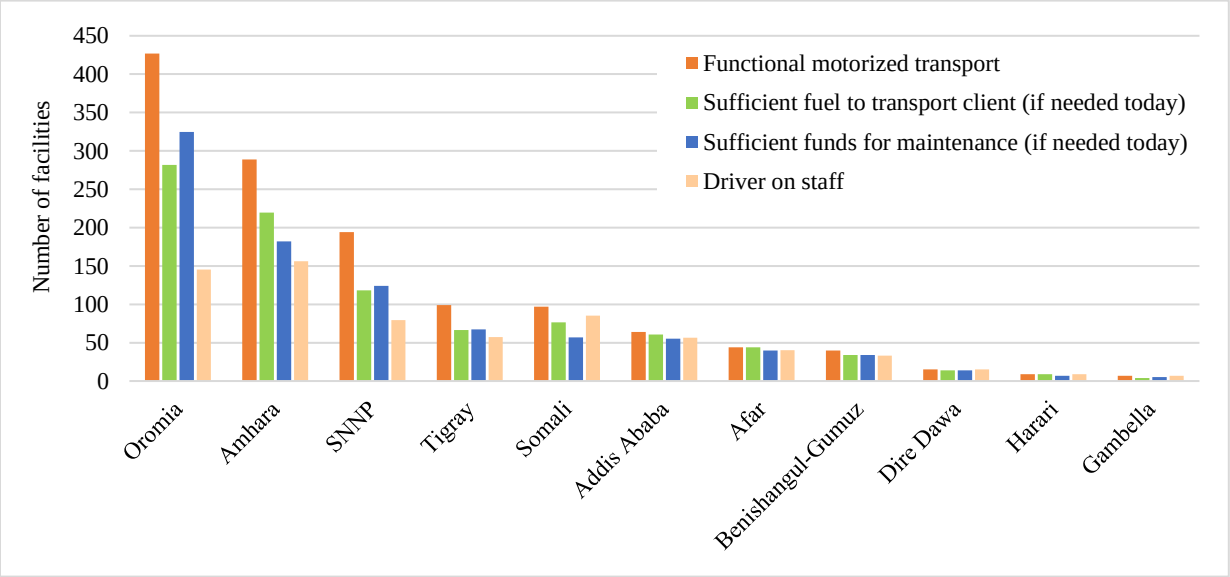


Table 11.5.1: Percent of facilities with their own functional motorized transport that had access to resources for fuel and maintenance, and reason for not having resources, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with their own functional motorized transport[1]	Facility had routine preventive maintenance schedule	Sufficient fuel available today to transport client if needed	Sufficient funds available today if maintenance needed	Number of facilities without sufficient funds available today if maintenance needed[2]	Reasons for insufficient funds for maintenance (multiple choices possible)			
						Waiting for government funds	Funds not planned	Waiting for health insurance funds	Funds ran out
National	1,285	51%	72%	70%	259	45%	42%	4%	27%
Region									
Tigray	99	58%	67%	68%	29	48%	41%	0%	31%
Afar	44	80%	100%	91%	4	50%	75%	0%	0%
Amhara	289	39%	76%	63%	61	31%	51%	0%	30%
Oromia	427	50%	66%	76%	73	51%	33%	4%	42%
Somali	97	41%	79%	59%	32	53%	47%	25%	16%
Benishangul-Gumuz	40	83%	85%	85%	5	80%	40%	0%	20%
SNNP	194	43%	61%	64%	46	46%	39%	0%	13%
Gambella	7	14%	57%	71%	2	50%	50%	0%	0%
Harari	9	78%	100%	78%	2	100%	50%	0%	0%
Addis Ababa	64	84%	95%	86%	5	0%	40%	0%	0%
Dire Dawa	15	93%	93%	93%	0	0%	0%	0%	0%
Facility type									
Referral/specialized hospitals	29	83%	93%	97%	0	0%	0%	0%	0%
General hospitals	95	73%	96%	85%	11	45%	27%	9%	9%
Primary hospitals	119	74%	87%	84%	15	53%	40%	7%	27%
MCH specialty centres	22	86%	91%	82%	3	0%	0%	0%	0%
Health centres	1,006	44%	67%	67%	230	45%	43%	4%	28%
MCH specialty clinics	8	75%	100%	100%	0	0%	0%	0%	0%
Higher clinics	6	83%	100%	100%	0	0%	0%	0%	0%
Managing authority									
Public/government	1,175	48%	70%	69%	246	47%	42%	4%	28%

	Number of facilities with their own functional motorized transport[1]	Facility had routine preventive maintenance schedule	Sufficient fuel available today to transport client if needed	Sufficient funds available today if maintenance needed	Number of facilities without sufficient funds available today if maintenance needed[2]	Reasons for insufficient funds for maintenance (multiple choices possible)			
						Waiting for government funds	Funds not planned	Waiting for health insurance funds	Funds ran out
Private-for-profit	68	82%	94%	85%	8	0%	38%	0%	0%
Private-not-for-profit[3]	42	79%	98%	88%	5	20%	60%	0%	40%
Location									
Urban	687	60%	80%	77%	113	47%	42%	4%	27%
Rural	598	41%	63%	64%	146	44%	43%	5%	27%

[1] Includes functional motorized ambulances plus other motorized transport (bicycles excluded).

[2] Respondents who answered 'don't know' to the question about the availability of funds for maintenance were excluded from the questions about why there were insufficient funds.

[3] Includes NGO, faith-based, or mission facilities.

Drivers on staff

As described in Table 11.5.2A in the Appendix on page 430 among the facilities that had their own ambulance or motor vehicle, 53 percent had a driver on staff: 68 percent had only 1 driver per ambulance per 24-hour shift and 32 percent had two drivers. More than a third of facilities with their own functioning motorized transport (37 percent) required their drivers to maintain a logbook for the vehicle. Marked variation was observed between public facilities and the private facilities; the latter facilities were better staffed with drivers.

Table 11.5.3A in the Appendix on page 431 shows the 254 facilities with a driver on staff for its motorized transport who maintained a logbook. Of those facilities where the logbook was observable, 80 percent demonstrated that the logbook was up-to-date and 69 percent had completed all the columns in the logbook. The data collectors inquired about the type of information routinely collected in the logbook, asking about 8 specific items. These items were not read aloud to the respondent, rather the respondent spontaneously offered the information. The most frequently mentioned items were the recording of day and time (85 percent), time of arrival at destination (80 percent), drop off destination (78 percent), mileage at departure and destination (75 percent). Twenty-four percent of facilities reported recording all eight items.

Among the 696 facilities with ambulance drivers, 93 percent said that their driver was usually available (Table 11.5.4A in the Appendix, page 433). Only 8 percent ever received first aid training. Among drivers who had received first aid training, the first aid topics most frequently received were external bleeding control (91 percent), use of a fire extinguisher (82 percent), and airway management (75 percent). Extrication and defensive driving were the topics least mentioned (28 percent each).

11.6 Comparisons between 2008 and 2016

The questionnaire in 2008 included very few questions on referral, unlike 2016. Thus, we compared only the existence of a functioning motorized ambulance (vehicle, motorcycle or tricycle) on-site.

On-site availability of a functioning ambulance appears to have improved among hospitals and MCH specialty centres and among private facilities, but remained the same at mid-level facilities and public facilities (Table 11.6.1). However, this does not take into consideration the increased availability of ambulances at district health offices or through dispatch centres.

Table 11.6.1: Percent of facilities with functioning motorized ambulance in 2008 and 2016, by facility type and managing authority, Ethiopia EmONC, 2016

	All facilities		Facility type				Managing authority					
			Hospitals/MCH specialty centres		Health centres/clinics		Public/government		Private-for-profit		Private-not-for-profit[1]	
	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016
Number of facilities	797	3,804	112	316	685	3,488	750	3,662	27	83	20	59
At least 1 type of functional motorized ambulance	18%	17%	58%	69%	12%	13%	17%	16%	44%	69%	40%	58%

[1] Includes NGO, faith-based, or mission facilities.

Chapter 12: Maternity Waiting Homes/Rooms

Key Findings

- More than half of facilities (53 percent) had either a stand-alone maternity waiting home (MWH) or a dedicated room within the facility for women waiting for labour to begin. Gambella was the only region with no MWH.
- Occupancy in MWHs is much lower than capacity would allow (only 2 occupants on average when mean capacity is 7).
- The majority of facilities with a MWH/room provided food (84 percent) and health education (88 percent) to women during their stay. Health promotion and education focused primarily on the risk of delivering at home, breastfeeding, and family planning.
- The most frequently cited barriers to the utilization of MWHs included "no one to care for the children at home or to prepare food" when a woman is absent, and "husbands do not allow."
- Interviews with MWH residents indicated that they spent on average 16 days at the MWH, although 5 percent of those interviewed had never been visited by a health worker and 16 percent hadn't been visited in more than 2 days.

Maternity waiting homes have been promoted in Ethiopia to improve pregnant women's access to quality and timely maternal health care services, especially for women with high risk pregnancies or women who live in remote areas.

MWHs are residential facilities located near a health facility to accommodate women in their final weeks of pregnancy to bridge the geographic gap in obstetric care between rural and urban areas and areas with poor access to a facility. Once labour starts, women would move to the health facility so that they can be assisted by a skilled birth attendant. Mothers and their newborns can also stay after delivery at MWHs for several more days to ensure all is well before traveling long distances to return home.

The EmONC assessment explored MWHs or rooms in relation to infrastructure, support services, capacity and current occupancy, barriers to usage, and provided a profile of occupants at the time of the survey. A MWH is considered a stand-alone structure while a maternity waiting room is generally a ward or room within the health facility itself that has been converted into a space where pregnant women can stay and sleep until labour begins.

12.1 Infrastructure, support, and services

Among the 3,804 health facilities assessed, 2,001 facilities (53 percent) had a MWH or room (Table 12.1.1). Only 20 percent of health facilities assessed had stand-alone MWHs, whereas 32 percent had maternity waiting rooms.

Regionally, 72 percent of health facilities in Amhara had MWHs or rooms, followed by SNNP and Oromia at 57 percent and 56 percent, respectively. Seven percent of facilities in Somali, Harari, and Addis Ababa had MWHs or rooms, and 6 percent in Afar. In Gambella, no facility had a MWH or room.

Fifty-six percent of health centres had either a MWH or room, followed by 27 percent of primary hospitals. Referral hospitals, MCH specialty centres, MCH specialty clinics, and higher clinics had neither MWHs nor rooms.

Public/government facilities were more likely (54 percent) to have MWHs than private-not-for-profit facilities (29 percent). Private-for-profit health facilities did not have MWHs or rooms.

MWHs and rooms were relatively evenly distributed between urban and rural locations. Fifty-five percent of health facilities in rural areas had MWHs or rooms compared to 48 percent in urban areas.

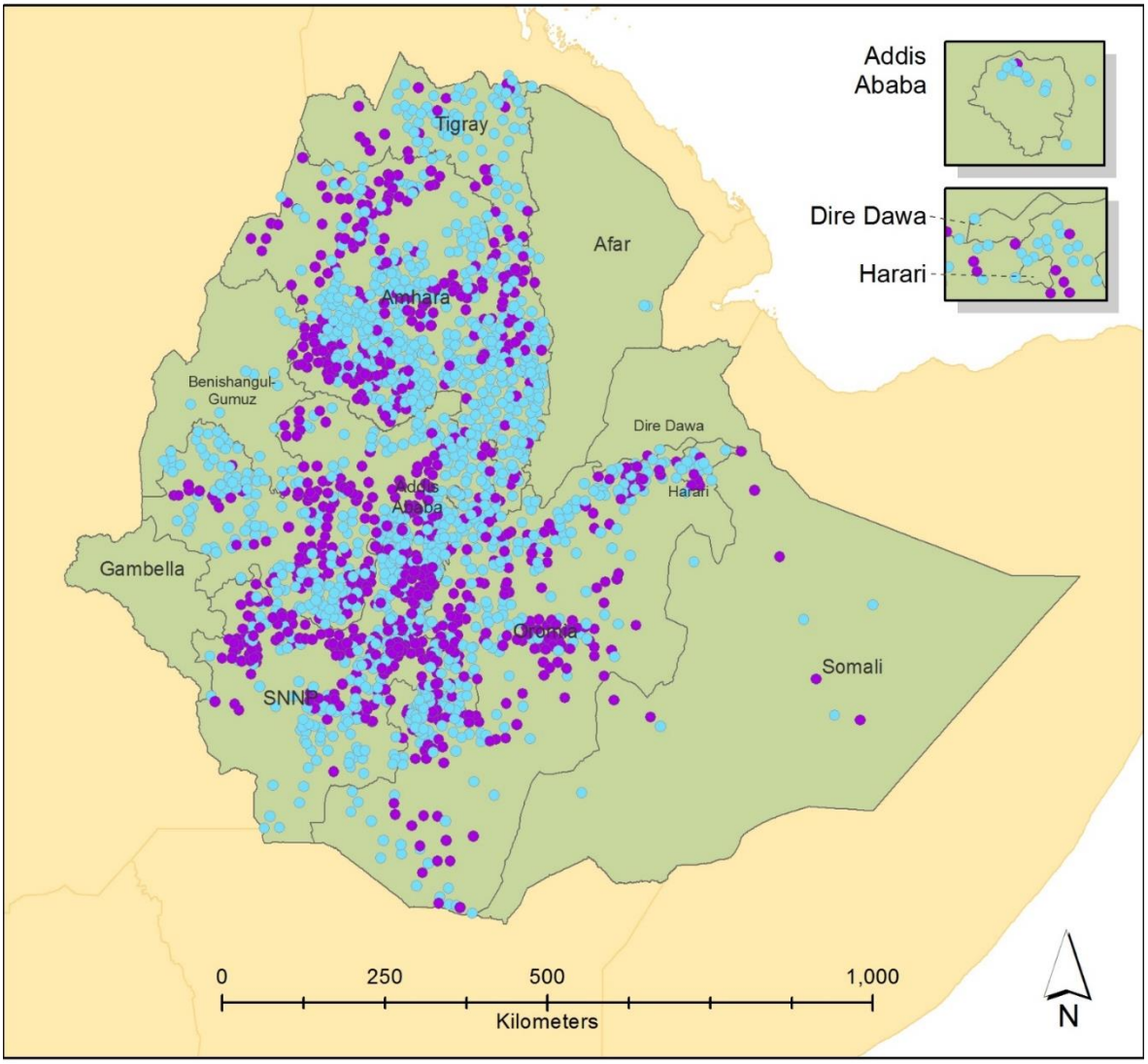
Table 12.1.1: Percent of facilities with a MWH/room, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Facilities with a MWH/room		Facilities with a stand-alone MWH	Facilities with a maternity waiting room
		n	%		
National	3,804	2,001	53%	20%	32%
Region					
Tigray	255	93	36%	9%	27%
Afar	77	5	6%	1%	5%
Amhara	876	631	72%	24%	48%
Oromia	1,405	792	56%	23%	33%
Somali	161	11	7%	3%	4%
Benishangul-Gumuz	43	11	26%	0%	26%
SNNP	773	444	57%	26%	32%
Gambella	27	0	0%	0%	0%
Harari	15	1	7%	0%	7%
Addis Ababa	151	11	7%	1%	7%
Dire Dawa	21	2	10%	0%	10%
Facility type					
Referral/specialized hospitals	30	0	0%	0%	0%
General hospitals	103	15	15%	7%	8%
Primary hospitals	160	43	27%	8%	19%
MCH specialty centres	23	0	0%	0%	0%
Health centres	3,459	1,943	56%	22%	35%
MCH specialty clinics	16	0	0%	0%	0%
Higher clinics	13	0	0%	0%	0%
Managing authority					
Public/government	3,662	1,984	54%	21%	33%
Private-for-profit	83	0	0%	0%	0%
Private-not-for-profit[1]	59	17	29%	12%	17%
Location					
Urban	1,497	724	48%	19%	29%
Rural	2,307	1,277	55%	21%	35%

MWH = maternity waiting home.

[1] Includes NGO, faith-based, or mission facilities.

Map 12.1.1: Location of Facilities with Maternity Waiting Home/Room



Nearly all (99%) facilities with MWHs or rooms received support either from the community, faith-based organizations, NGOs, the facility itself, or a combination of those sources (Table 12.1.2A in the Appendix, page 435). The most common source of support was from the community (82 percent) followed by NGOs (63 percent). The most common kinds of support for the MWHs or rooms, in descending order, were: food (87 percent), furniture (83 percent), construction of infrastructure (81 percent), and maintenance (65

percent). There were no major differences between urban and rural facilities in the likelihood of receiving support or the source or type of support received.

Sixty-five percent of facilities with MWHs or rooms had a finished floor material (Table 12.1.3). Twenty-eight and 6 percent of health facilities with MWHs had a natural or rudimentary floor material, respectively. The floor materials of MWHs and rooms were better (finished floors) in private-not-for-profit facilities than in public facilities (88 percent as opposed to 65 percent) and in facilities that were located in urban as opposed to rural areas (74 percent compared to 61 percent). Seventy-three percent of facilities with MWHs had electricity, with some difference between urban (87 percent) and rural (65 percent) settings. Among facilities with a MWH or room with a power source, most (51 percent) had electricity from the grid and another source. Fifty-seven percent and 75 percent of facilities with MWHs or rooms had water and a latrine/toilet available to women staying in the MWH or room, respectively.

Table 12.1.3: Percent of facilities with a MWH/room according to floor material, electricity, water, and toilet, by facility type, managing authority, and location, Ethiopia EmONC, 2016

		Facility type[1]		Managing authority[2]		Location	
	National	General/ primary hospitals	Health centres	Public/ government	Private-not-for-profit[3]	Urban	Rural
	n=2,001	n=58	n=1,943	n=1,984	n=17	n=724	n=1,277
Floor material (% distribution)							
Finished	65%	84%	65%	65%	88%	74%	61%
Natural	28%	10%	29%	29%	6%	19%	34%
Rudimentary	6%	5%	6%	6%	6%	7%	6%
Electricity available	73%	97%	72%	73%	88%	87%	65%
Source of electricity (% distribution)	n=1,462	n=56	n=1,406	n=1,447	n=15	n=633	n=829
Grid only	28%	71%	26%	27%	67%	41%	17%
Grid + other	51%	27%	52%	51%	33%	52%	50%
Other only (generator, solar, etc.)	21%	2%	22%	22%	0%	7%	32%
Water available	57%	86%	56%	57%	88%	69%	50%
Source of water (% distribution)	n=1,136	n=50	n=1,086	n=1,121	n=15	n=499	n=637
On-site	71%	70%	71%	71%	73%	79%	65%
Within 500m	15%	15%	15%	15%	13%	13%	17%
Beyond 500m	14%	15%	14%	14%	13%	8%	19%
Toilet/latrine available for women staying in MWH	75%	88%	75%	75%	94%	79%	73%
	n=1,504	n=51	n=1,453	n=1,488	n=16	n=575	n=929
Toilet used by others	66%	66%	65%	65%	88%	69%	63%

MWH = maternity waiting home.

[1] No referral/specialized hospitals, MCH specialty centres, MCH specialty clinics, or higher clinics reported a MWH/room; thus, they do not appear in the table.

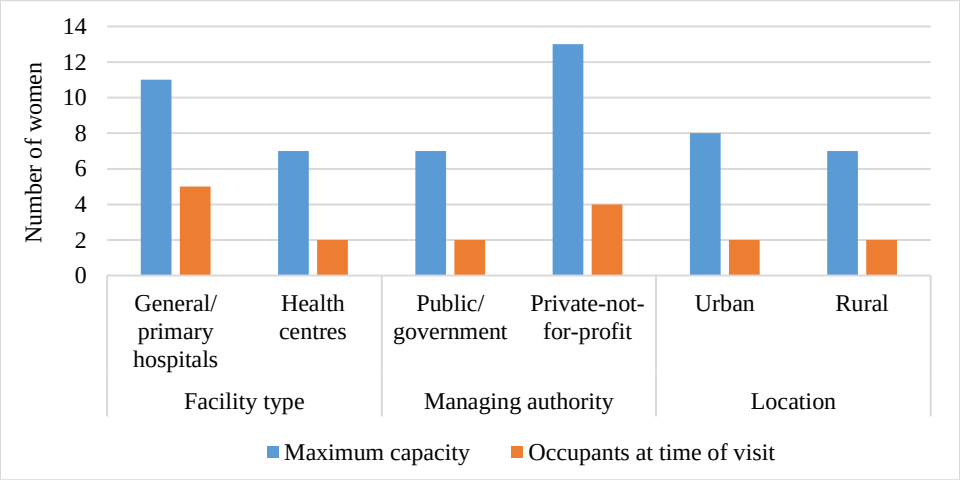
[2] No private-for-profit facility reported a MWH/room; thus, they do not appear in the table.

[3] Includes NGO, faith-based, or mission facilities.

12.2 Capacity, occupancy, amenities, and health education

Fifty-five percent of facilities with MWHs or rooms had 1 room, 25 percent had 2 rooms, and 20 percent had 3 or more rooms (Table 12.2.1A in the Appendix, page 436). There was very little difference in the number of rooms of MWHs in rural and urban areas. The mean maximum number of women who could stay at the MWHs or rooms (i.e. MWH capacity) was 7, however, the mean number of occupants at the time of visit was 2. Both capacity and occupancy for MWHs were higher in private-not-for-profit facilities than in public facilities, however, as above, limited variation was observed between urban and rural settings (see Figure 12.2.1). In 45 percent of facilities with a MWH or room, sleeping space was shared. Sleeping conditions at the maternity waiting rooms or homes varied: 58 percent of facilities had a bed with a mattress whereas 37 percent had a mattress on the floor.

Figure 12.2.1: Mean maximum capacity of MWH/room and mean number of occupants at time of visit in facilities with a MWH/room, by facility type, managing authority, and location, Ethiopia EmONC, 2016



Eighty-four percent of facilities with MWHs or rooms provided food to women during their stay (Table 12.2.2). MWHs located in health centres (85 percent) were more likely to provide food to women than were hospitals (64 percent). A higher percentage of public/government health facilities provided food than did private-not-for-profit facilities with MWHs or rooms.

Table 12.2.2: Percent of facilities with a MWH/room that provided selected forms of support to women during their stay, by facility type, managing authority, and location, Ethiopia EmONC, 2016

		Facility type[1]		Managing authority[2]		Location	
	National	General/ primary hospitals	Health centres	Public/ government	Private-not-for-profit[3]	Urban	Rural
	n=2,001	n=58	n=1,943	n=1,984	n=17	n=724	n=1,277
Provided food	84%	64%	85%	84%	65%	81%	86%
Maintained a garden	8%	16%	8%	8%	24%	7%	9%
	n=162	n=9	n=153	n=158	n=4	n=52	n=110
Women worked in the garden, if MWH had garden	49%	22%	50%	49%	50%	38%	54%
Welcomed family	95%	97%	95%	95%	100%	96%	95%
Provided health education	88%	88%	88%	88%	76%	86%	88%
Last health education session	n=1,751	n=48	n=1,703	n=1,738	n=13	n=626	n=1,125
When it occurred (% distribution)							
Yesterday	27%	42%	26%	27%	23%	26%	27%
Last week	39%	25%	39%	39%	31%	39%	39%
2 weeks ago	12%	19%	12%	12%	23%	11%	12%
More than 2 weeks ago	17%	4%	18%	17%	15%	16%	18%
Don't know	5%	10%	5%	5%	8%	8%	4%
Topics discussed[4]	n=1,658	n=43	n=1,615	n=1,646	n=12	n=575	n=1,083
Risk of birth in the community	86%	100%	86%	86%	100%	87%	86%
Family planning	80%	91%	80%	80%	75%	82%	79%
Importance of breastfeeding and tips on how to breastfeed	80%	98%	79%	80%	83%	80%	80%
Care for baby	74%	81%	73%	74%	83%	75%	73%
Importance of postpartum check-ups for both mother and baby	69%	77%	68%	68%	83%	69%	68%

MWH = maternity waiting home.

[1] No referral/specialized hospitals, MCH specialty centres, MCH specialty clinics, or higher clinics reported a MWH/room; thus, they do not appear in the table.

[2] No private-for-profit facility reported a MWH/room; thus, they do not appear in the table.

[3] Includes NGO, faith-based, or mission facilities.

[4] Recall based on prompted items during interviews with facility staff, not with women residing at MWH/room. Only respondents who knew when the last health education session had occurred were asked this question.

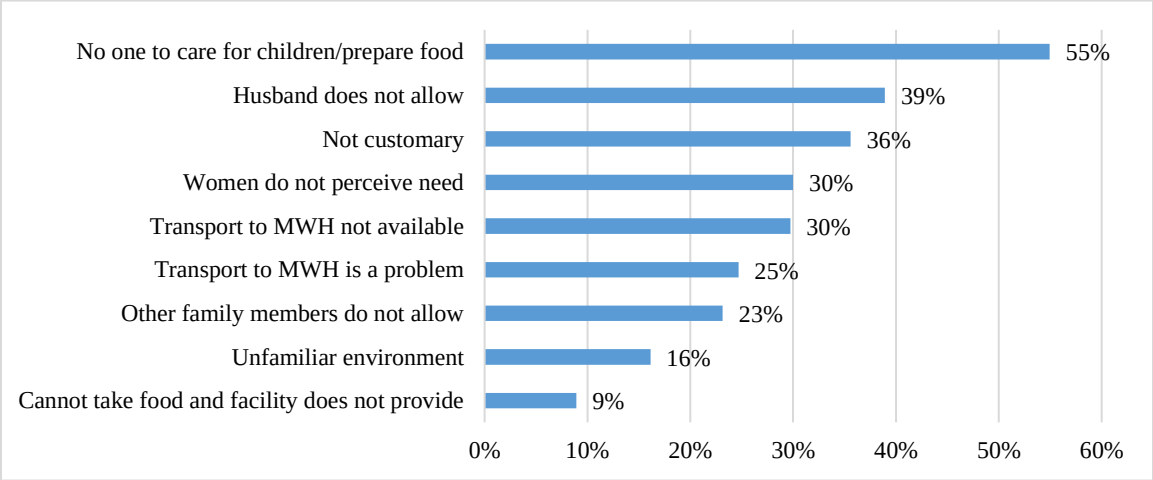
Eighty-eight percent of facilities with MWHs provided health education. There was no difference in the percent of hospitals or health centres that provided health education, but public facilities were more likely to do so than private-not-for-profit facilities (88 and 76 percent, respectively). Recall of session topics for health education revealed that 'risk of birth in the community' was the topic most frequently reported at the

MWHs (86 percent), followed by 'family planning' and 'importance of breastfeeding and tips on how to breastfeed,' reported by 80 percent each.

12.3 Barriers to usage

Among facilities with MWHs surveyed, 55 percent reported barriers to the utilization of the MWH (Table 12.3.1A in the Appendix, page 437). Somali region facilities reported the highest level of barriers to MWHs (73 percent), followed by Amhara (70 percent) and Tigray (63 percent). Among facilities that reported existing barriers, 55 percent cited 'no one to care for children or prepare food' if the woman was absent, and 39 percent cited 'husband does not allow' (Figure 12.3.1). The types of barriers deterring women from using MWHs were quite similar in urban and rural areas, with the exception of transport, which was a bigger problem in rural settings (Table 12.3.1A in the Appendix, page 437). It should be noted that questions about barriers to using MWHs were answered by facility staff (the medical director or his/her designee) and not by women themselves.

Figure 12.3.1: Percent of facilities that mentioned selected cultural factors as deterring women from using maternity waiting homes/rooms, among facilities reporting that cultural barriers exist, Ethiopia EmONC, 2016



12.4 Profile of current occupants

Up to two women who were staying at the MWH or room at the time of the visit were asked if they would grant a short interview; 993 responded affirmatively, after giving their consent.

Twenty-eight percent and 24 percent of women interviewed at the MWHs or rooms were in the age range of 18-24 and 25-29 years, respectively; the median age was 28 years old (Table 12.4.1A in the Appendix, page 438). Forty-six percent of women interviewed at the MWHs or rooms already had 3 or more living children. Sixty-six percent of mothers had no formal education and 29 percent had either completed or partially completed only their primary education.

Ninety-four percent of mothers interviewed at the MWHs or rooms had not yet delivered while six percent were post-partum.

Among the 993 mothers interviewed at MWHs or rooms, 63 percent came on foot and 18 percent came by ambulance, whereas only 2 percent arrived by animal and 2 percent by bicycle (Table 12.4.2). The average travel time to reach to the MWH or room was 5 hours. Travel times were longest in Tigray (8 hours on average) and shortest in Somali (2 hours on average).

Fifty percent of women interviewed at MWHs said that they had been referred either from the community or by someone at a facility. Among those women, facility referral constituted 39 percent and community referral 61 percent.

Sixty percent of the mothers interviewed at the MWHs or rooms were accompanied by their husbands.

Table 12.4.2: Percent distribution of interviewed MWH/room occupants according to transport used, travel time, referral, and whether accompanied, by region, Ethiopia EmONC, 2016

	National	Region[1]				
		Tigray	Amhara	Oromia	Somali	SNNP
	n=993	n=62	n=375	n=180	n=5	n=371
Transport used						
On foot	63%	65%	62%	65%	60%	64%
Ambulance	18%	27%	22%	10%	20%	15%
Public	7%	5%	4%	11%	20%	7%
Private	4%	3%	3%	3%	0%	5%
By animal	2%	0%	2%	4%	0%	2%
Bicycle	2%	0%	0%	2%	0%	4%
Other	5%	0%	7%	5%	0%	3%
Average travel time (hours)	5	8	5	5	2	4
Referral						
Referred (% yes)	50%	34%	44%	31%	20%	68%
Referred by:	n=494	n=21	n=166	n=55	n=1	n=251
Facility	39%	38%	23%	53%	100%	46%
Community	61%	62%	75%	47%	0%	54%
Accompanied by (% yes)						
Husband	60%	48%	60%	66%	40%	58%
Sister	12%	18%	15%	23%	0%	4%
Other family	32%	37%	38%	38%	60%	22%
Children	10%	15%	13%	7%	0%	8%
Other	9%	8%	10%	10%	0%	8%

MWH = maternity waiting home.

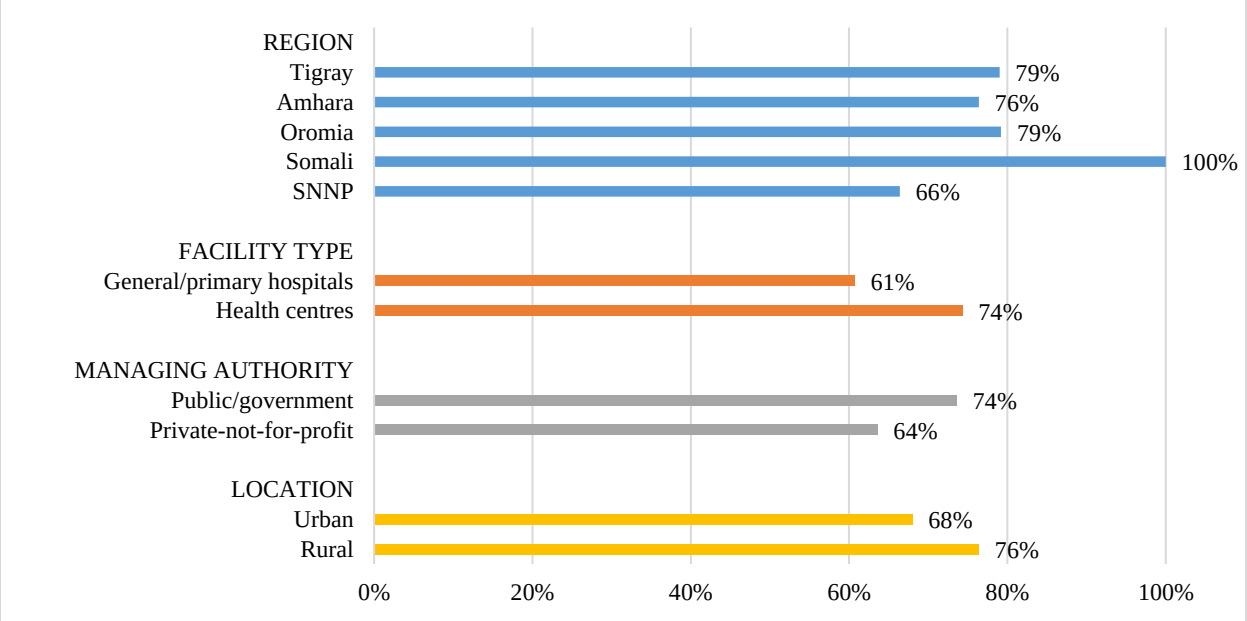
[1] The regions of Afar, Benishangul-Gumuz, Gambella, Harari, Addis Ababa, and Dire Dawa are not included in the table as either no women from these regions were interviewed, or the region had no MWHs/rooms.

Women were asked why they were staying at the MWH or room. Table 12.4.3A in the Appendix on page 439 shows the distribution of their answers, which included their imminent delivery (38 percent), a desire to deliver in a facility or with a professional (13 percent), linking a healthy baby and a safe delivery with a facility birth (10 percent), and more specific concerns around special care or treatment (10 percent). Small percentages of women mentioned that they had been told to come (3 percent) or lived far from the facility (1 percent).

The average number of days that women had stayed at the MWHs was 16 (Table 12.4.4A in the Appendix, page 440). The duration of stay was highest for women in Somali at 28 days and lowest in Oromia at 12 days. The duration of stay was longer in hospitals (26 days) than in health centres (15 days). Moreover, the duration of stay in urban areas was 18 days while in rural areas it was 14 days.

The majority of interviewed mothers (74 percent) had been visited by health workers in the last 24 hours, but 16 percent had not been visited for more than 2 days and 5 percent had not been visited at all. A greater percentage of interviewed mothers in health centres (74 percent) and rural areas (76 percent) had been visited in the last 24 hours than mothers in hospitals (61 percent) and urban areas (68 percent) (Figure 12.4.1). Ninety-seven percent of interviewed occupants of the MWHs or rooms said they would recommend staying there to other women in the future (Table 12.4.4A in the Appendix, page 440).

Figure 12.4.1: Percent of interviewed MWH/room occupants who were visited by a health worker yesterday, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016



Chapter 13: Woreda, Zonal, and Regional Health Care System Interviews

Key Findings

- Although availability of a liaison officer and referral directory are key elements of ensuring service delivery, only 18 percent of woredas had a liaison officer in every facility and only 10 percent had a liaison officer in some facilities.
- Woredas (28 percent) and zones (19 percent) had major shortages in assigned quality assurance officers.
- The vast majority of woreda health offices (96 percent), zones (88 percent), and regions (89 percent) had annual plans for human resources for health.
- Nine percent of regions, 2 percent of woredas and less than 1 percent of zones reported that they provided no supervisory activities.
- Nationally, 82, 77, and 76 percent of regions, woredas and zones were implementing health care financing reform in all zones/facilities/woredas. However, community-based health insurance was less widespread: implemented in 65 percent of zones, 32 percent of woredas, and 30 percent of regions.
- The eHMIS system was in place in 96 percent of woredas, 99 percent of zones and in all regions.
- Only 29 percent of woredas, 38 percent of zones, and 73 percent of regions reported that they had a vital statistics and civil registration system in place.
- Observation of the policy or guidelines for maternity waiting homes was low: 18 percent of woredas and regions, and 15 percent of zones.
- All regions and zonal health offices had at least one functional ambulance, while 7 percent of woredas had none.

WHO's handbook[50] on monitoring the building blocks of health systems articulates core elements of a typical health system. These core elements are service delivery, health workforce, health information system, access to essential medicines, financing, and leadership and governance. The handbook describes a health system that encompasses organizations, institutions, human resources, and finances that act collectively to improve the health of the populations they serve.

The health system modules for woredas, zones, and regions were crafted based on these assumptions with minimal variation in the questions administered at each level. In this chapter, the assessment results are organized according to the six building blocks. Woreda, zonal and regional bureau representatives (mostly

[50] World Health Organization. Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies. World Health Organization, 2010.

MCH directors) or their delegates were interviewed. EmONC assessment regional coordinators were the key interviewers of those representatives or their delegates except for a few areas where the data collectors and supervisors interviewed respondents at the woreda level.

13.1 Service delivery

Health care service delivery is essential to reduce maternal, neonatal, and child mortality. To measure the progress made, it is crucial to measure the dimensions of health care service delivery at different health tier levels. Accordingly, the EmONC assessment collected information on service delivery status at woreda, zonal, and regional levels.

The availability of a liaison officer and referral directory were key elements of ensuring good service delivery and facilitating a smooth transfer of clients from lower to higher levels. As shown in Table 13.1.1, only 18 percent of the woredas had liaison officers in all their facilities and only 10 percent had a liaison officer in some facilities. The main reasons that woredas lacked a liaison officer in every facility was that health centres had no structure (no policy) for a liaison officer (53 percent), followed by lack of budget (28 percent), and not considering a liaison officer as important (10 percent). This question was not applicable at zonal and regional levels.

Availability of a comprehensive referral directory at all levels of health care management helps to improve the service delivery of specialized or emergency care. However, less than one-third of woredas, zones, and regions had referral directories. Over half of woredas (56 percent) and regions (55 percent), and two-thirds of zones (67 percent), rated their own referral systems as average or below average, indicating a large gap in the referral system.

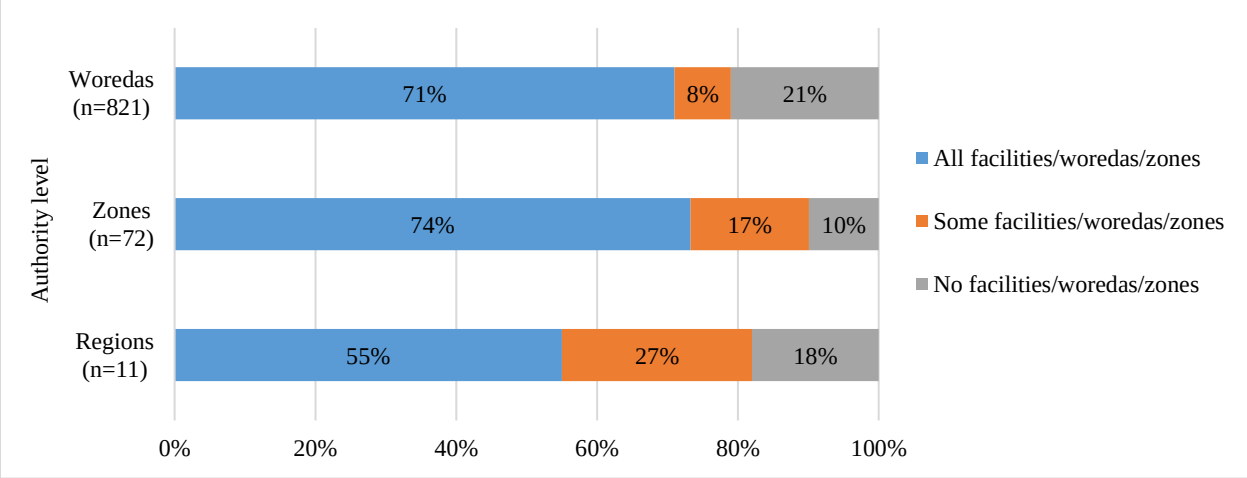
Table 13.1.1: Percent distribution of woredas, zones, and regions according to availability of liaison officers and referral directory, Ethiopia EmONC, 2016

	Woredas n=821	Zones n=72	Regions n=11
A liaison officer is available in:			
All facilities	18%		
Some facilities	10%		
No facilities	71%		
Reasons why all facilities do not have a liaison officer (% yes)	n=671		
Health centres do not have (no policy)	53%		
Lack of budget	28%		
Not considered important	10%		
Other	26%		
Referral directory available (% yes)	29%	32%	27%
Self-assessment of referral system in catchment area			
Very weak/weak	12%	18%	9%
Average	44%	49%	46%
Strong/very strong	44%	33%	45%

Table 13.1.2A in the Appendix on page 441 shows the availability of a quality improvement system and associated activities at woreda, zonal, and regional levels. The existence of a quality improvement unit was found in 52 percent of woredas, 22 percent of zones, and 45 percent of regions. Among the regions that had no quality improvement unit, half of them (50 percent) reported that this was due to the unavailability of standards for establishing a quality improvement unit, followed by lack of budget (33 percent). In relation to quality improvement interventions, only 28 percent of the woredas had a quality assurance officer in each facility and 19 percent of zones had an assigned quality assurance officer in each woreda, leaving an enormous shortfall in personnel to focus on quality assurance.

Based on unprompted, spontaneous answers, respondents reported that a widely-used quality assurance activity specific to MNH services was the implementation of the MDSR (45 percent of woredas), followed by morbidity audit (39 percent), and mother-baby friendliness of facility (31 percent). However, when asked directly whether the maternal/perinatal death surveillance and response initiative was implemented in all facilities, 71 percent of the woredas answered affirmatively, 74 percent of zones reported all woredas were implementing it, and 55 percent of regions said that all zones had implemented the MDSR (Figure 13.1.1). Woredas, zones and regions were asked how they participated in MDSR activities. As Table 13.1.2A in the Appendix on page 441 shows, 66 percent of woredas, 68 percent of zones, and 55 percent of regions said they participated in maternal death reviews; meanwhile, 63 percent of woredas, 71 percent of zones, and 73 percent of regions had prepared reports on maternal death reviews.

Figure 13.1.1: Percent distribution of woredas, zones, and regions according to how many are implementing MDSR, Ethiopia EmONC, 2016



13.2 Health workforce

Global evidence shows a strong link between the health workforce and positive population health outcomes[51]. Without the right number and mix of skilled health workers, a country is unlikely to meet its health goals.

Health bureaus were asked whether they had an organogram, and if they said they did, the interviewer asked to see it (Table 13.2.1). Forty percent of woredas and regions and 35 percent of zones were observed to have an organogram by the interviewer. All regions had an MNH unit, while 81 percent of zones and 75 percent of woredas had MNH units. The average number of human resources available in the MNH team was 12 in zones, 8 in regions, and 3 in woredas, showing marked differences.

Regarding MNH unit team composition, regions had at least one nurse, midwife, and health officer but no physician (MD), while woredas and zones had at least one health officer and nurse, but no midwife. The great majority of woreda health offices (96 percent) had an annual plan for human resources for health, compared with a relatively lower proportion of zones (88 percent) and regions (89 percent). Regional health bureaus were more likely than woredas or zones to recruit, deploy, or redeploy technical staff, but woredas were the most likely to discipline or reward health workers (94 percent).

[51] Speybroeck N, et al. Reassessing the relationship between human resources for health, intervention coverage and health outcomes. Background paper prepared for: The world health report 2006. Geneva, Switzerland.

Table 13.2.1: Percent of woredas, zones, and regions with selected management and human resource characteristics, Ethiopia EmONC, 2016

	Woredas n=821	Zones n=72	Regions n=11
Health department[1] has organogram (% distribution)			
Has and observed by data collector	40%	35%	40%
Has but not observed by data collector	14%	35%	40%
Does not have	45%	31%	20%
Health department[1] has an MNH unit	75%	81%	100%
Average number of human resource in a team	3	12	8
Team composition (average number)			
Health officer	1	1	3
Midwife	0	0	2
Nurse	2	1	1
MPH in RH		1	
Physician (MD)			0
Others	0	1	1
Health department[1] has an annual human resources for health plan	96%	88%	89%
Reasons for gap between established and filled positions			
Unavailability in the market	75%	67%	73%
Lack of budget	57%	38%	27%
Lack of staff motivation	43%	26%	36%
Other	75%	26%	9%
Health department[1] has authority to:			
Recruit technical staff	42%	67%	90%
Assign/deploy technical staff	64%	65%	91%
Transfer/redeploy technical staff	79%	69%	91%
Discipline or reward health workers	94%	79%	73%

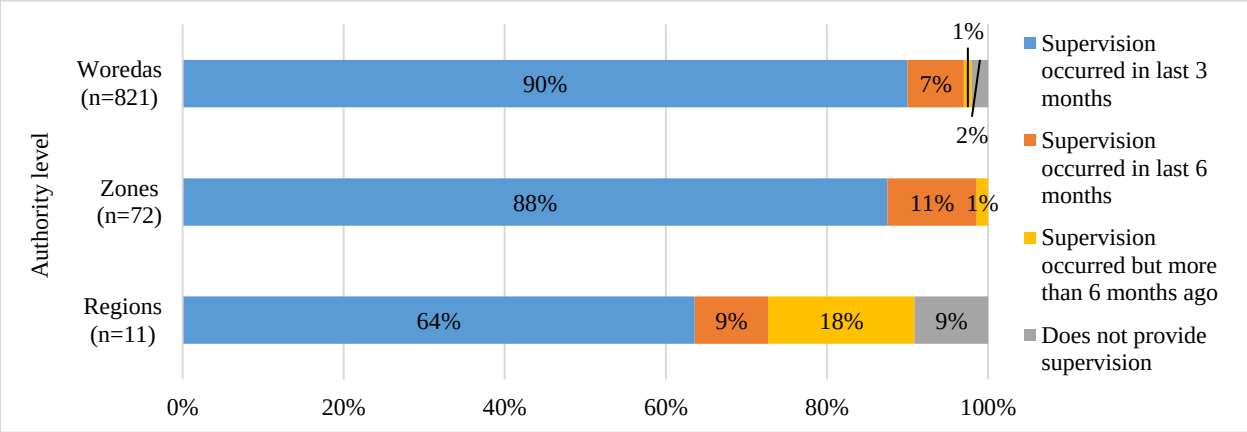
[1] Refers to either woreda health offices, zonal health departments, or regional health bureaus, depending on level interviewed.

Figure 13.2.1 shows only 9 percent of regions, 2 percent of woredas, and less than one percent of zones provided no supervisory activities. At the woreda level, nurses (91 percent) were the most common professional on a supervisory team, followed by health officers (60 percent), and druggists/pharmacists (33 percent) (Table 13.2.2A in the Appendix on page 442). The most common target of supervision was public/government facilities across zones (100 percent), woredas (96 percent), and regions (90 percent). Supervision also took place at private-for-profit and private-not-for-profit facilities, but at lower rates.

Supervisory activities consisted of a range of different activities. In woredas, observing the work of the provider (88 percent), providing feedback to providers (85 percent), and discussing performance based on

MNH service data (84 percent) were the three key activities conducted. These three activities were also the key activities used at zonal and regional levels, although not in the same order or at the same magnitude. Checklists were used to assess the quality of MNH services and the availability of drugs, equipment, and supplies at almost all levels (90 percent or higher). However, when it came to documentation, only two-thirds of zones and woredas and 80 percent of regions kept supervisory reports. Woredas and zones were more likely to provide performance related feedback to facilities and woredas, respectively, than regions provided to zones. Woredas (92 percent) and zones (96 percent) provided feedback primarily through written letters, while all regions gave immediate feedback during the supervisory visit and provided written feedback to a lesser degree (75 percent). As part of the performance review of MNH services, most regions, zones, and woredas had at least one review meeting in the last year, but one-quarter of regions, 13 percent of zones, and 10 percent of woredas had never had a review meeting.

Figure 13.2.1: Percent distribution of woredas, zones, and regions according to frequency of supervision, Ethiopia EmONC, 2016



13.3 Health care financing

Health care financing is one of the critical components of the Ethiopian health system[52]. Ethiopian health care has undergone serious reform to enable revenue retention by health facilities, standardize the exemption of services, outsource nonclinical services, set and revise user fees, initiate compulsory health insurance (community-based health insurance and social health insurance), establish private wings in public hospitals, and encourage health facility autonomy[53,54]. Anecdotal evidence shows increased health care utilization, access to medicines, and quality of services as results of these reforms.

[52] Zelelew H. Health Care Financing Reform in Ethiopia: Improving Quality and Equity. Health Systems 20/20, Abt Associates Inc., USAID: 2012. http://www.healthsystems2020.org/content/resource/detail/85865/; accessed June 20, 2017.

[53] Eskinder E, Ali B. Health Care Financing in Ethiopia: Implications on Access to Essential Medicines, Elsevier, https://doi.org/10.1016/j.vhri.2014.06.005; accessed June 20, 2017.

[54] Alebachew A, Yusuf Y, Mann C, Berman P. Ethiopia's Progress in Health Financing and the Contribution of the 1998 Health Care and Financing Strategy in Ethiopia. Harvard T.H. Chan, School of Public Health, 2015.

As shown in Table 13.3.1, nationally, 82, 77, and 76 percent of regions, woredas, and zones were implementing health care financing reform in all zones/facilities/woredas, respectively. Among those entities that were not implementing health care financing reform, lack of awareness was the most commonly stated reason, reported by 50 percent of regions, 43 percent of woredas, and 35 percent of zones, followed by lack of clarity of the reform in woredas and zones. Community-based health insurance was implemented (in all or some kebeles/woredas/zones) in 65 percent of zones, 32 percent of woredas, and 30 percent of regions. Among entities where community-based health insurance was only partially implemented or not being implemented at all, the primary reason for lack of implementation was that it was considered a new initiative; this was true for 78 percent of woredas, 70 percent of zones, and 46 percent of regions.

Table 13.3.1: Percent of woredas, zones, and regions that were implementing health care financing reform and community-based health insurance[1], Ethiopia EmONC, 2016

	Woredas	Zones	Regions
	n=821	n=72	n=11
Implementing health care financing reform (% distribution)			
All facilities/woredas/zones	77%	76%	82%
Some facilities/woredas/zones	11%	13%	9%
No facilities/woredas/zones	13%	11%	9%
Reasons for not implementing health care financing reform	n=192	n=17	n=2
Lack of awareness	43%	35%	50%
Lack of clarity	32%	18%	0%
Other	30%	77%	100%
Implementing community-based health insurance (% distribution)			
All kebeles/woredas/zones/special woredas	25%	1%	0%
Some kebeles/woredas/zones/special woredas	7%	64%	30%
No kebeles/woredas/zones/special woredas	68%	35%	70%
Reasons for not implementing community-based health insurance	n=611	n=71	n=11
New initiative	78%	70%	46%
Lack of acceptance	19%	14%	27%
Other	16%	41%	64%
Existence of other types of community-level health care financing for MNH	29%	44%	

[1] Non-response varies across items and is less than 1%. Non-responses are excluded.

13.4 HMIS

Nationally, the eHMIS system was reported to be in place in 96 percent of woredas, 99 percent of zones, and in all regions (100 percent) (Table 13.4.1), but it should be noted that only 70 percent of facilities had computers and only 7 percent had access to the internet (Table 6.5.1A on page 358). Among the catchment areas of the woredas, on average only 3 facilities had the eHMIS in place; for zones, the average was 12 woredas that had an eHMIS in place. The most frequent time interval of data collection from the HMIS was monthly (96 percent of woredas and zones, and 82 percent of regions). The authorities reported that they used the MNH service statistics to calculate MNH indicators and to monitor progress (89 percent in

woredas, 93 percent in zones, and 90 percent in regions). Similar levels of use for planning were also reported.

Data collectors requested to observe and assess the completeness of the most recent eHMIS report. At the woreda level, three-fourths of eHMIS reports were observed to be complete; this dropped to nearly two-thirds at the zonal level and 60 percent of regions. This points to probable bottlenecks in the health management system caused by poor quality (incomplete) HMIS data at the different health system levels.

Table 13.4.1: Percent of woredas, zones, and regions with eHMIS system, frequency of service statistics collection, uses of MNH service information, and completeness[1], Ethiopia EmONC, 2016

	Woredas	Zones	Regions
	n=821	n=72	n=11
eHMIS system in place	96%	99%	100%
Average number of facilities/woredas/zones with eHMIS system in place in catchment area	n=791 3	n=71 12	n=11 1
Frequency of eHMIS service statistics collection (% distribution)	n=791	n=71	n=11
Immediately		0%	
Weekly	3%	0%	18%
Monthly	96%	96%	82%
Quarterly	0%	1%	0%
Other	1%	3%	0%
Uses of MNH service information	n=791	n=71	n=11
Calculating indicators to monitor progress	89%	93%	90%
Planning	94%	94%	91%
Sending reports to upper level	93%	96%	91%
Providing feedback	91%	92%	82%
Don't use but archive	13%	1%	27%
Other	4%	16%	18%
Completeness of most recent eHMIS MNH report (% distribution)	n=791	n=71	n=11
Observed by data collector and complete	74%	63%	60%
Observed by data collector but incomplete	12%	13%	20%
Could not be observed by data collector	14%	24%	20%

[1] Non-response varies across items and is less than 1%. Non-responses are excluded.

13.5 Leadership and governance

Good governance and leadership play critical roles in the decentralization of institutional responsibilities, and hence, enable local structures to examine the effectiveness, efficiency, equity, and sustainability of health services in improving quality of life[55]. Cognizant of this assumption, the health system modules

[55] Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). Health Sector Transformation Plan: 2015/16 – 2019/20. Addis Ababa, Ethiopia: FMOH, 2015.

included questions that reflect aspects of leadership and governance. Table 13.5.1 shows that 86 percent of the 821 woredas had a mechanism in place to assess client satisfaction; among the means of doing so, a suggestion box was the leading mechanism (71 percent), followed by health facility or area health committees (59 percent), and occasional client satisfaction surveys (45 percent).

Table 13.5.1: Percent of woredas, zones, and regions with selected governance characteristics[1], Ethiopia EmONC, 2016

	Woredas n=821	Zones n=72	Regions n=11
Mechanism in place for assessing client/client satisfaction	86%		
Methods used to assess client/client satisfaction			
Routine/regular client satisfaction surveys	43%		
Occasional client satisfaction surveys	45%		
Complaint/suggestion boxes	71%		
Health facility or area health committees	59%		
Other	10%		
No mechanism in place for assessing satisfaction/no information	14%		
Vital statistics and civil registration system in place	29%	38%	73%
Cost of birth registration and certification (% distribution)			
There is a cost	4%	4%	
Cost exists only if home birth	0%	1%	
No cost for registration and certification regardless of birth location	25%	32%	
No vital statistics system in place/no information	71%	63%	
There is a cost for maternal and neonatal death registration and/or certification	16%	4%	
All facilities have a Board	89%	89%	
	n=731	n=64	
All facility Boards have community representatives	97%	86%	

[1] Non-response varies across items and is less than 1%. Non-responses are excluded.

Regions (73 percent) were more likely than zones (38 percent) or woredas (29 percent) to report having in place a vital statistics and civil registration system. A small percentage (4 percent) of woredas and zones reported that they charge for birth registration and certification. In addition, a few zones (4 percent) and 16 percent of woredas reported that they charge to register or certify a maternal or neonatal death.

When asking about maternity waiting home guidelines or written policy, the interviewers observed such documents in only 18 percent of woredas and regions, and 15 percent of zones (Table 13.5.2A in the Appendix, page 443).

All regions and zonal health offices had at least one functional ambulance, while 7 percent of woredas had no functional ambulance. All regions, 90 percent of zones, and nearly half (47 percent) of woredas had two or more ambulances. Budget availability for ambulance fuel, maintenance, "shifting" of drivers (more than

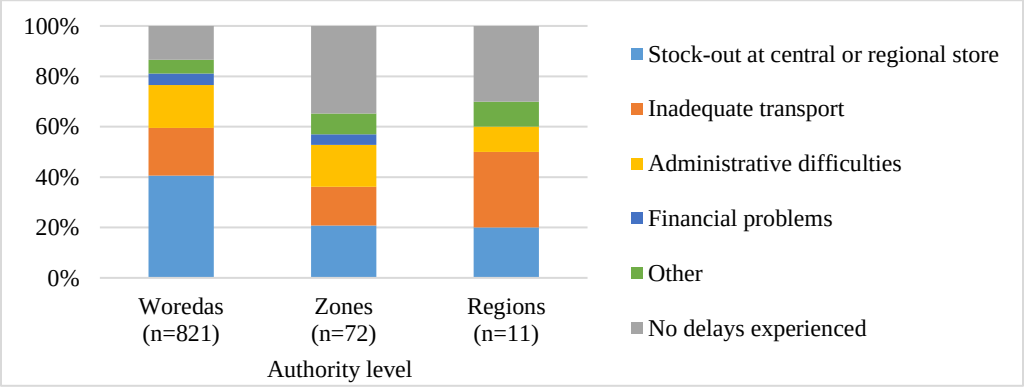
one driver), and overtime fees for ambulance service were consistently the highest in woredas compared to zones and regions. In woredas, the hospital liaison officer (87 percent) and woreda office (86 percent) were the leading bodies charged with ambulance management, while the Red Cross and health centres were also cited as major controlling bodies in zones (67 percent) and woredas (63 percent).

13.6 Essential medicines, supplies, equipment, and diagnostics

The availability of medical stores varied across woredas, zones, and regions (Table 13.6.1A, page 444 in the Appendix), with 79 percent of woredas, 68 percent of zones, and 64 percent of regions having a medical store. Regional or zonal suppliers provided supplies of drugs for woredas, zones, and regions more than NGOs or private pharmacies. Stock outs of essential MNH drugs occurred in the 3 months prior to the survey in over half of woredas (59 percent) and zones (57 percent) and in half of the regions.

Among major essential drugs experiencing stock outs, magnesium sulphate took the lead at all levels. The main reason for stock outs of essential MNH drugs was delayed delivery from suppliers: this was the primary cause for stock outs in 100 percent in regions, 79 percent of woredas, and 66 percent of zones. The most common cause of delays in delivery of supplies among woredas was stock out at the central or regional store (41 percent), followed by inadequate transport (19 percent); among zones it was stock out at central or regional store (21 percent); and among regions it was inadequate transport (30 percent) (Figure 13.6.1).

Figure 13.6.1: Percent distribution of woredas, zones, and regions according to most common cause of delay in delivery of supplies, Ethiopia EmONC, 2016



Chapter 14: Recommendations

14.1 Coverage and readiness of emergency and routine services: Problems identified and their recommendations for action

Gap in the number of fully functioning EmONC facilities compared to the minimum recommended: In 2016 Ethiopia had just 40 percent of the recommended number of fully functioning EmONC facilities per 500,000 population. Of all facilities, 31 percent were missing just 1 or 2 signal functions (very close to fully functioning), and another 41 percent were missing 3 or 4 signal functions.

Recommendations:

- Prioritize resources to the 31 percent of facilities that lack 1 or 2 signal functions, doing so with respect to equity considerations, geographic location and number of people served.
- As the Ministry of Health draws referral catchment networks, ensure that EmONC assessment data feed into the process of prioritizing which health centres to upgrade to make effective well-distributed networks.
- Optimize the available geo-coded data to conduct GIS mapping to determine the number of people in a facility catchment area and better determine equity.

Low performance of anticonvulsant signal function: Only about a quarter of all facilities provided parenteral anticonvulsants, ranging from 80 percent of hospitals to 20 percent among health centres. Readiness to provide at health centres was relatively high (almost 60 percent). And yet, 32 percent of the facilities that did not perform this signal function, did not have anticonvulsants in stock.

Recommendations:

- Further investigation to understand low performance of anticonvulsant signal function. How are cases managed at the basic level? What are levels of knowledge and confidence around administering a loading dose of magnesium sulphate? How is the record-keeping around this?
- Address pre-eclampsia treatment as part of pre-referral guidelines.
- Reinforce providers of antenatal care to take blood pressure – ensure that equipment is well calibrated, providers are competent at this basic skill, and client candidates are actively followed.
- Investigate the assessment data together with MDSR results to better understand where cases are treated and where women are dying of hypertensive disorders.

Low provision of assisted vaginal delivery: 65 percent of facilities did not provide this basic signal function in the 3 months prior to the survey, indicating poor coverage of this life-saving intervention. Of those that did not provide it, the reasons for non-provision reported by facility staff included: lack of supplies and equipment (50 percent), no indication (50 percent), and training needed (24 percent) (multiple response were allowed). Assessment data indicated that hospitals were almost universally ready to provide the intervention (95 percent of hospitals were staffed and equipped for AVD), but health centres were not: just 44 percent of health centres/clinics were ready. The problem among health centres was both a lack of equipment (59 percent had equipment for AVD) and staff (54 percent had staff to provide AVD).

Recommendations:

- Prioritize strengthening this signal function in facilities that are not able to perform CS or are not in proximity to a facility that can provide CS.
- Arrange in-service training (e.g. strengthen BEmONC training to improve confidence level and motivation of staff) for the 65 percent of facilities that did not perform AVD.
- Facilities with extreme caesarean delivery rates might be another target for AVD promotion.

Low performance of postabortion care at health centres: Thirty-four percent of health centres were ready to provide removal of retained products by MVA or D&C, while nearly 50 percent had the appropriate health worker to perform the signal function. The limiting factor was the appropriate drugs, equipment and supplies. Removal of retained products was done at only 39 percent of health centres/clinics.

Recommendation:

- Performance as well as readiness of this signal function is challenged by lack of equipment and supplies. Hence, first supply those health centres/clinics that are missing equipment but have available human resources.

Poor readiness of hospitals/MCH specialty centres to provide blood transfusion: Just 45 percent of hospitals/MCH specialty centres were ready (staffed and equipped) to provide blood transfusion. Despite 79 percent having the appropriate health worker to perform blood transfusion, just 46 percent had the required equipment and reagents. Nevertheless, 65 percent had provided the intervention in the 3 months prior to the survey, suggesting that facilities were providing blood transfusion in less than optimal conditions. Most hospitals that provided blood transfusion indicated that their source of blood was the central supply (61 percent); yet 39 percent used a facility bank or direct transfusion. Among this latter group, just 45 percent had bags for collecting blood.

Recommendations:

- There should be an uninterrupted supply of reagents for blood typing/cross matching.
- Equip all hospitals that have their own blood banks with a refrigerator, microscope or blood bags. Fifty-two of the 112 hospitals/MCH specialty centres that did not provide blood transfusion reported that they lacked equipment and/or supplies.
- A special study should be conducted to clearly identify whether facilities are getting blood units easily from either central or regional blood banks or from facility-based blood banks even if they are equipped with the required equipment and/or reagents. Additional analysis of the assessment data could provide a starting point.

Gap in the number of fully functioning EmNeC facilities both in hospitals and health centres/clinics: Only 35 percent of hospitals/MCH specialty centres and less than 1 percent of health centres/clinics provided all emergency newborn care signal functions.

Recommendations:

- Prioritize resources to the 34 percent of hospitals/MCH centres (48 facilities) that were missing just 1 or 2 newborn signal functions, followed by the 15 percent (36 facilities) missing 3 or 4 signal functions, with respect to equity considerations, geographic location and number of people served.

- Continue upgrading at least a quarter of the 87 percent health centres/clinics that function as partial EmNeC, perhaps focusing first on the 123 facilities (4 percent of health centres) that were missing just 1 or 2 signal functions.
- GIS analyses would enable us to determine the number of people in a catchment area for a facility and better determine equity.

Low provision of antenatal corticosteroids in mid-level health facilities: Provision of antenatal corticosteroids is primarily the treatment standard of hospitals. Of the 3,488 health centres/clinics, only 5 percent provided either betamethasone or dexamethasone. Readiness for provision among health centres/clinics was hampered by both lack of drugs (fewer than half of health centres had the required drugs) and lack of trained human resources (less than one-third of health centres had the required staff). A large proportion of health centres indicated that they had observed no indications among their clientele to provide corticosteroids; yet, given the gap in available staff to provide it, this might be due to poor recognition of signs or symptoms that would signal its use. Universal readiness for this signal function at hospitals was challenged primarily by lack of human resources able to provide antenatal corticosteroids (13 percent of hospitals were without the needed staff).

Recommendations:

- Avail antenatal corticosteroids in all health centres that lacked these drugs.
- Provide training to health workers on the treatment guidelines to enable them to identify women whose foetus might benefit from antenatal corticosteroids, and enable them to provide it.

Low performance and readiness to provide KMC for small babies: KMC was provided in the last 3 months prior to the survey in 49 percent of facilities. Eighty-nine percent of facilities that did not provide KMC (1,949 facilities) cited no indication as the reason; however, observations and further analysis of assessment data showed that lack of training and lack of bed/designated place for KMC were also pertinent barriers to provision. In fact, just 45 percent of facilities were staffed and equipped to provide this signal function. Most often, facilities were missing KMC guidelines, and a designated bed and place for small babies. About 26 percent of live births in facilities in 2015 were low birth weight (<2,500 grams), 2.3 percent were very low birth weight (<1,500 grams), and 4.5 percent were pre-term babies.

Recommendations:

- KMC is a crucial package for saving newborn lives, particularly for low birth weight neonates. Hence, training of midwives and nurses on KMC is a critical step of implementation according to the KMC guidelines. Distribution of KMC guidelines is crucial.
- In addition, availability of bed for KMC in the delivery room for those facilities that did not provide KMC is a priority action.
- A special study might be needed on hypothermia as it has been reported elsewhere as the leading cause for very early neonatal death in Ethiopia.

A small percentage of deliveries took place in EmONC facilities: 13 percent of expected deliveries took place in EmONC facilities suggesting that access barriers still exist (both supply and demand side) for women delivering in fully functioning EmONC facilities. This percentage is low because most facility births (82 percent) took place in health centres and only 7 percent of health centres were functioning at a

BEmONC level. The 2014 DHS reported that 21 percent of women identified distance or transport as a barrier to delivering in a facility. EmONC facilities were particularly scarce in Gambella, Somali, and Afar. Thus, prioritizing facilities for upgrading based on geographic location and impact on access is indicated.

Recommendations:

- Provide information on distance and location of health facilities to the Rural Road Development Programme and other road and infrastructure decision-makers with explanations of how these geospatial factors act as a barrier to accessing care and the adverse health outcomes that follow.
- Further analysis is needed to better understand what are the specific challenges with distance and access.

Need to understand demand side dynamics to provide tailored recommendations to increase access and utilization: In some areas with very low met need for EmONC there may be different demand side dynamics relevant to planning and prioritization. Met need for EmONC varied across the regions driven by different reasons in each region. Met need was highest in Addis Ababa (83 percent) and lowest in Gambella (3 percent). Met need in Addis Ababa might be affected by use of facilities in the capital among women who live outside the city.

Recommendations:

- By drawing on data for the regions, interested parties could look at dimensions of the problems around access and utilization and identify challenges unique to each region. This process could start by choosing one region to show how this can be done.
- Specific recommendations following this analysis could include: MWHs, raising awareness through HEWs.

Gaps in adolescent youth friendly and safe abortion services: 45 percent of all health facilities reported that they provide youth friendly services. Only 39 percent of health centres/clinics provided safe abortion services. However, this was reported and not observed so it would be useful to verify.

Recommendations:

- Provide orientation of Ethiopia's safe abortion guidelines to higher and mid-level facilities (could be integrated with EmONC training). Particular emphasis should be given to those mid-level facilities that are in proximity to the nearest surgical facility in improving referral services for managing PAC and other obstetric complications.
- There is a need for a special study to verify whether reporting aligns with the requirements of adolescent friendly service practice. There is currently no baseline available and this will be needed.

Some facilities still charge for services that should be free: Though few, some public facilities reported that they charge women for normal delivery, they require payment before treatment of obstetric emergency, and for medicines, supplies and drugs. There was a large disparity in user fees between public and private-for-profit facilities that might deter women from accessing facilities for obstetric emergencies. Less than 4 percent of the public and over 70 percent of private-for-profit facilities charge women for normal delivery, treatment before obstetric emergencies, and medicines and supplies. Over 75 percent of regions, zones and

woredas were implementing healthcare financing reform in the country. Meanwhile, community-based insurance system was implemented in only 32 percent of woredas.

Recommendations:

- There should be a regulation as per the national healthcare financing reform regarding user fees for women with obstetric emergencies, for normal delivery, and for supplies/medicines. Waiving user fees has the potential to reduce the second delay (in accessing health facilities) and the third delay (prompt treatment).
- Improve community-based and social insurance systems both in the public and private-for-profit facilities.

Lack of civil registration system: With the establishment of the MDGs and SDGs, strengthening civil registration systems has become a global recommendation. Only a quarter of facilities reported that families could register the birth of their baby on-site. Less than 10 percent of facilities in Afar, SNNP or Gambella offered this opportunity. Only 29 percent of woredas reported that the vital statistics/civil registration system functioned in their woredas, as did 38 percent of zones, and 73 percent of regions.

Recommendations:

- Identify the relevant government body responsible for implementing vital statistics/civil registration, and work with that agency to ensure implementation within facilities at absolutely no cost to the person/family who wants to register a birth or a death. This will be a long-term effort, but the system should be put in place within this strategic period (HSTP 2015/16 – 2019/20).
- A concerted effort by the MOH and its partners should advocate for the implementation of the vital statistics/civil registration system at all levels of the system.

14.2 Infrastructure: Problems identified and their recommendations for action

Shortage of facilities: Despite the expansion in the number of facilities in recent years, according to government guidelines of how many healthcare facilities there should be at different levels of the health system, substantial gaps still exist between the desired number of primary hospitals and rural health centres and the actual number. The gap in primary hospitals was 778 and for rural health centres 1,449. The regions most affected were Oromia, Amhara and SNNP. Gaps were not observed for referral or general hospitals or urban health centres.

Recommendations:

- Additional primary hospitals and rural health centres should be built during the current strategic planning period. Regions with the greatest gaps should be prioritized.
- With further specialized analyses, health authorities can determine the optimal locations, based on road networks and population density; planners can use GIS location allocation techniques as part of their planning.
- During the planning process of building new facilities, inter-sectoral integration—construction, electricity, water, telecommunications— should be the guiding standard.

Availability of maternity beds: The number of maternity beds falls far below the standard of 30-32 beds per 1,000 institutional births. Nationally, the assessment found an average ratio of 19 maternity beds, with even fewer in Oromia, Amhara and SNNP. Reports of women having to share beds, sleep on the floor, or deliver on the floor were not insignificant in referral and general hospitals.

Recommendation:

- Increase the number of maternity beds in Oromia, Amhara, SNNP, as well as referral and general hospitals to meet standards. The construction of additional facilities will also mean equipping new facilities and bringing the bed to patient ratio into a more reasonable alignment. In the short term, existing beds could be redistributed to cover acute inequities.

Barriers to obstetric surgery: Only 80 percent of hospitals provided obstetric surgery. The availability of operating theatres (OT) was one barrier. All hospitals should have been built with space and infrastructure for an OT, but 1 referral hospital, 6 general hospitals and 22 primary hospitals were without a general OT, and many more did not have a separate ob/gyn OT.

Recommendations:

- Further investigation based on the findings in this assessment as well as other sources is needed to determine whether these hospitals completely lack the physical space for an OT, if the room simply requires renovation to make it functional, or whether equipment or staff is missing.
- Meanwhile, all hospitals with an existing OT should be equipped, have adequate lighting and running water, and the staff needed to make the OTs functional within the year.

Space shortage for mini blood banks: Fewer than half of hospitals had a separate room for a mini blood bank, more had a combined space for a laboratory and a mini blood bank. For example, 43 percent of referral hospitals had separate space and 83 percent shared space with the laboratory; only 25 percent of primary hospitals had separate space and 31 percent shared space with the laboratory. General hospitals fell in between.

Recommendation:

- The FMOH must ensure that all hospitals have a separate room for a mini blood bank. The relevant regulatory sector needs to assess and enforce standards in all hospitals.

Short supply of electricity services: Thirteen percent of health centres had no source of electricity and only 60 percent had access to the electric grid. Access to the grid was particularly problematic in Somali and Gambella where only 37 and 44 percent of their facilities were connected to the grid, respectively.

Recommendations:

- Although a long-term process, expanding access to the electrical grid for all health centres, and for Somali and Gambella in general, should be prioritized.
- In the short term, facilities without any source of electricity should be supplied with an alternative power source such as solar systems.

Inadequate water supplies: A quarter of health centres had no access to water, an increase since 2008. Afar, Amhara, Somali and Gambella had the greatest needs. Among facilities that reported access to water, 76 percent had water on-site or within the compound, but 18 percent had to travel more than 500 metres to reach water. Furthermore, although facilities may have had a source of water, half of those that did, reported shortages for a day or longer in the 3 months before the survey visit.

Recommendations:

- Provide access to improved water 24-hrs/day in health centres (providing water where it is not), focusing on Afar, Amhara, Somali, and Gambella.
- In the short-term, understanding the causes of shortages might lead to solutions.

Access to modes of communication within facilities: Only 36 percent of facilities had at least one mode of functional communication on-site. Coverage was poor across all regions, but Gambella reported the greatest scarcity of means of communication (only 7 percent of facilities). Internet access was found at only 7 percent of facilities, a serious challenge for the eHMIS.

Recommendations:

- Provide all facilities with at least one mode of communication beginning with Gambella region. In areas where landlines are feasible, these would be preferable. Otherwise, cell phones should be provided.
- Increase internet access to all facility levels. If cable internet access is feasible, this may be pursued. Otherwise, consider EVDOs (especially for rural health centres, assuming cellular service); at least 1 per facility.

14.3 Human resources: Problems identified and their recommendations for action

Shortage of health professionals in relation to FMHACA standards: Gaps exist between the available health professionals and the minimum FMHACA standards for pharmacist/druggists (5,229 deficit, nationally), midwives (1,046), nurse anaesthetists (301), laboratory technicians (192), MD anaesthesiologists (149), and neonatologists (22).

Recommendations:

- Prioritize training and recruiting more health cadres for which gaps were observed based on FMHACA standards.
- The production and assignment of more pharmacists/druggists, midwives, anaesthesiologists (MD) and NICU-trained nurses is highly recommended to yield high quality obstetric outcomes.
- Harmonize standards on human resource requirements, since multiple standards exist and in some cases the standards are not aligned, such as: National HRH strategy document, midwifery road map, HSDP IV and global standards.
- Ensure implementation of standards.
- To close the nursing gap at general hospitals (3,903 deficit, nationally), regions might consider reposting from health centres to general hospitals without compromising the health centres' need.

Performance of surgery by some cadres not permitted by regulation: Some facilities reported that caesarean deliveries were provided by MDs, HOs, midwives and nurses.

Recommendation:

- A policy should be developed for medical doctors and HOs regarding performance of caesarean delivery. In addition, BSc Nurses, midwives and health officers should not perform caesarean delivery unless they have been specially trained.

A low proportion of midwives, nurses and HOs have been trained in BEmONC, HBB and NICU, especially among those working in health centres/clinics: Among health workers who were actively providing obstetric and newborn care, 22 percent of midwives received BEmONC training and 17 percent received HBB training, while 52 percent and 44 percent of obstetrician/gynaecologists had received the same training, respectively. Proportions of midwives receiving this training were substantially higher among those working in hospitals/MCH specialty centres than among those in health centres/clinics. A smaller proportion of nurses and HOs relative to midwives had received BEmONC, HBB and NICU training. Further, from the assessment of provider knowledge on these same topics, scores among midwives, nurses and HOs were low (scoring lower than 60 out of 100).

Recommendations:

- Training in BEmONC, essential newborn care, and HBB should only be given to mid- level health professionals with priority for midwives, followed by nurses and health officers working at primary health care units. Moreover, only special orientation on BEmONC and CEmONC should be developed to update high-level health cadres.
- Potential strategies might include better distribution of ob/gyns (and filling the staffing gap as per the HSDP target) and/or task-shifting some of the midwives' activities to nurses (who are also widely available across facilities). Nurses are already performing these interventions in many facilities, suggesting that the actual shifting-of-tasks has already occurred in some places. One strategy may be to scale-up and formalize this task-shifting, coupled with training for those nurses.
- Nurses should train on NICU followed by midwives, health officers, paediatricians and medical doctors.
- Avail access to checklists, guidelines and m-health tools to update the knowledge of providers on complication management, in particular.
- Implement the national Continuous Professional Development Program to motivate individual practitioners to update themselves.
- Establish reading corners/libraries with access to e-learning courses and references as a way of staying current with practices and technologies.
- Update/revise training packages as per the current recommendations and procedures, for example applying chlorhexidine on the cord.

Gaps in CEmONC training among doctors, ESOs and HOs: Among health professionals who are actively providing obstetric and newborn care, fewer than 5 percent of medical doctors and health officers have received CEmONC training. There are also gaps in the percent of ob/gyns and ESOs who have been trained in CEmONC, with 35 percent and 15 percent, respectively, having received CEmONC training.

Recommendation:

- The Ministry and partners need to advocate for the incorporation of CEmONC in the pre-service curriculums of medical doctors and health officers, and to clarify regulatory policies relating to these cadres performing the CEmONC signal functions.

Poor coverage for emergencies during evening and weekend hours: At times other than Monday through Friday during the day, facilities are largely staffed by midwives and nurses. ESOs and HOs are typically not on-site at these times, yet results indicate that ESOs and HOs are key staff providing emergency obstetric and newborn care.

Recommendations:

- For key health worker cadres, whose presence is crucial to manage obstetric emergencies, special incentives or accommodations should be arranged to encourage them to be on duty at night and on weekends/holidays.
- ESOs played key roles in the provision of basic and comprehensive emergency obstetric services, thus it is highly recommended to produce and deploy competent ESOs.

Very few providers of any cadre had a written copy of their job description, and fewer than half reported that the reporting structure (clinical or administrative) was clear: Less than 45 percent of providers interviewed knew of a written management structure/organogram and reporting lines, and less than 25 percent of respondents knew of a written job description for their position (just 16 percent had a hard copy of the job description).

Recommendation:

- Establish appropriate HR management procedures for those health facilities with this problem, focused on addressing problems related with job description, lines of reporting, supervision, performance appraisal and leave).

14.4 Drugs, equipment, and supplies: Problems identified and their recommendations for action

Stock outs of essential drugs: The principal reason behind stock outs of essential drugs was ascribed to stock outs at central store (reported by 42 percent of facilities). Difficulties with transport and administrative problems were also reasons given by one in 4 facilities. About half of facilities reported specific stock outs of $MgSO_4$ and dexamethasone.

Recommendations:

- Training and ongoing supervision of pharmacists related to timely ordering and quantification of essential medicines is needed. This should include the initiation and regular up-keep of a drug inventory register/IPLS system.
- Central store stock outs of essential drugs are a national problem and requires being addressed by the Ministry.
- Further regional analysis by facility type will be helpful for planning and prioritization.

Stock outs of oxytocin due to interruptions in the cold chain: This problem was reported by 25 percent of facilities with a pharmacy or supply of medicines, but was highest among health centres (26 percent) and higher clinics (33 percent).

Recommendation:

- The FMOH should work with the Ethiopian Society of Obstetrics and Gynaecologists and other stakeholders to identify the most appropriate thermostable oxytocic for use throughout the country, e.g. misoprostol. This collaboration should include the preparation and distribution of national guidelines with regard to the use of misoprostol.

Lack of national guidelines: At facility level the availability of guidelines was inadequate on the following topics: Obstetric topics (52 percent of facilities had), Infection prevention (52 percent had), Preterm births, LBW, KMC (48 percent had), and reimbursement (9 percent had).

Recommendation:

- FMOH should revise, update and distribute the above guidelines in collaboration with relevant stakeholders to the health facilities.

Shortage of equipment and supplies for newborn care: Certain items of neonatal resuscitation packs were found missing more than others, including face masks sizes 0 and 1 and resuscitation tables. This was especially true at health centres and for equipment and supplies for small and sick newborns. Only 17 percent of facilities had designated space for KMC and 15 percent had KMC registers.

Recommendations:

- Essential supplies, registers, guidelines and equipment should be provided to all general and referral hospitals to ensure neonatal care can be provided as per the standards of the national guidelines.
- All health facilities should establish registers for sick babies and for KMC.
- FMOH and RHBs should promote KMC practice at all levels of the health system.

Lack of life-saving medicines: Severe anaemia is a major indirect cause of maternal mortality but can be treated during pregnancy with iron sulphate. However, 22 percent of health facilities had no iron sulphate in stock at the time of the assessment. Similarly, magnesium sulphate (50 percent concentration), the drug of choice for severe pre-eclampsia and eclampsia, was missing at 52 percent of facilities.

Recommendations:

- Iron sulphate with folic acid is essential for all pregnant women. The FMOH should take responsibility for ensuring a continuous national supply.
- All facilities should have $MgSO_4$ and antihypertensives – as hypertensive disorders are treatable, but if left untreated, are a leading direct cause of maternal death.

Shortage of tests for infection screening: The availability of screening tests such as hepatitis B and C, malaria, HIV, and syphilis were found in short supply in many facilities, especially in health centres where these tests should be part of routine antenatal care. Even pregnancy tests were not everywhere.

Recommendation:

- Increase the availability of tests for Hepatitis B and C, HIV, TB, syphilis and malaria.

Lack of ultrasound machines: At primary hospitals, only 63 percent had an ultrasound.

Recommendation:

- All primary hospitals should be equipped with functional ultrasounds and appropriate support in maintaining the machine is essential.

Lack of accurate clock with visible second hand: Without an accurate and visible time piece – watch or clock – it is impossible to document when vital signs are measured, when procedures are started or finished, or when births take place. Only 37 percent of facilities had such a time piece. The availability of a clock was particularly rare at health centres (33 percent).

Recommendation:

- All health facilities should have a watch/clock with a visible second hand available in the delivery area and neonatal resuscitation area.

Lack of autoclave: Only 51% of facilities had an autoclave. All levels of hospitals and more than half of health centres lacked autoclaves. Why so many had no autoclave warrants some investigation. Facilities without grid access are likely to be unable to support an autoclave; the 16 percent of facilities with only solar electricity, for example, will not be able to power an autoclave.

Recommendation:

- FMOH should provide an autoclave to all health facilities without one as long as the facility's power supply can support an autoclave.

14.5 Clinical quality: Problems identified and their recommendations for action

Non-universal use of partograph: Despite substantial improvement since 2008, around one-quarter of facilities surveyed were not using the partograph to monitor labour. Among private, for-profit facilities, partograph use was quite low (just 40 percent of facilities). Some possible barriers to use emerged from assessment findings: just 50% of facilities indicated that they had ANC cards (with partograph) to fill in for women in labour. And, among the 792 facilities who had not used the partograph in the three months prior to the survey, 73 percent indicated that it was due to "lack of supplies;" another 15 to 17 percent indicated that it was due to "lack of training" and "weak management."

Recommendations:

- Ensure that the ANC charts, with partograph, are routinely available at every facility.
- Create awareness among the management team at woreda and health facility level of the importance of ensuring facilities are supplied with client charts having partograph.

Poor partograph completion: In facilities that are using the partograph, improvements in correct completion should be a priority: 7 percent of the 5,252 partographs reviewed during this assessment did not correctly chart the first dilatation on the alert line. Furthermore, subjective assessment by reviewers indicated that a substantial proportion of reviewed partographs (17 percent) may have been completed after delivery. The utility of the partograph as a tool to identify when women require intervention can only be realized if: 1) partographs are completed as labour progresses, and 2) the first dilatation is correctly charted.

Recommendations:

- Improve supportive supervision and on-the-job mentoring for providers, targeted to the cadres primarily responsible for partograph completion: midwives and ESOs in hospitals; midwives, nurses and HOs in health centres/clinics.
- Include orientation on partographs for health managers and other experts at woreda and zonal levels so they can support providers to correctly complete the partograph while they are providing supervision.
- Linked to the above recommendation, increase the proportion of woredas where the health department has an MNH unit (just 74% of woredas do), and consider adding midwives to the team composition.

Inappropriate augmentation: Augmentation was started unnecessarily before the action line was reached in 42 percent of reviewed partographs. Four percent of partographs reviewed in health centres indicated that augmentation was used, despite the recommendation that augmentation only be used where surgery is available. Among more than half of cases where augmentation was used, the timing of the augmentation was not indicated on the partograph. In addition, among health centres that provided parenteral uterotonics, 13 percent did so to induce or augment labour. Likewise, among health centres that used misoprostol for ob/gyn indications, 8 percent did so to induce labour.

Recommendation:

- As FMHACA regulates proper practice of services at all levels, they should regulate whether augmentation can be performed at lower level facilities. Augmentation should be performed only in facilities with surgical capacity.

Gap in use of prophylactic uterotonics and antibiotics for caesarean deliveries: Women delivering by caesarean received prophylactic uterotonics only 50 percent of the time, and prophylactic antibiotics only 68 percent of the time (among 568 reviewed cases of caesarean delivery).

Recommendations:

- Roll out the safe childbirth checklist and safe surgery checklist to support routine and surgical procedures.
- Develop training materials for caesarean delivery.
- Track use of uterotonics to maximize utilization for prevention of PPH after caesarean, and to encourage improved record-keeping of this intervention.
- Reinforce the message that the nationally recommended uterotonic is parenteral oxytocin.

Low and high rates of caesarean delivery at the population level: The national caesarean delivery rate in 2016 was lower than the minimum recommended: 2.7 percent vs. 5 percent minimum. Eighty percent of hospitals provided obstetric surgery, and sixty-nine percent were ready to provide surgery (properly staffed and equipped). The limiting factor in terms of readiness was the lack of appropriate equipment, specifically anaesthesia equipment (anaesthesia machine, halothane or ketamine). But the caesarean delivery rate varied widely by location and by managing authority – it was below the minimum in rural areas and above the 2015 WHO Consensus statement of 10 percent in urban areas like Addis Ababa. Institutional caesarean delivery rates were excessively high among private-for-profit facilities where 54 percent of deliveries were abdominal. What is emerging is a map of too many and too few caesareans depending on where a woman lives and the type of facility she chooses; both scenarios can leave mothers and babies at risk of severe morbidity and mortality.

Recommendations:

- Women who need a CS are not reaching a facility that can provide CS. All levels of hospitals should be staffed and equipped to provide this life-saving procedure.
- A quality improvement committee or organization such as the Ethiopian Society for Obstetricians and Gynaecologists should focus on this topic to better understand what is driving the rising urban caesarean delivery rate and its consequences. Perhaps the development of better training materials (mentioned above) will support better decision-making.
- A special study to look at what percent of referrals are for CS may be helpful; using the three-delay model may also help to explore low CS rates.

Gaps in the quality of care for women experiencing severe complications: Among the maternal deaths reviewed with a recorded cause of death, haemorrhage was the main contributor (42 percent of cases reviewed). Most of the reviewed maternal deaths were followed by either a neonatal death (52 percent) or an unknown newborn outcome (22 percent). Across the three maternal complications reviewed – PPH, severe pre-eclampsia/eclampsia, and sepsis - clinical management and/or monitoring were poor. For example, only 61 percent of PPH cases indicated the underlying cause of the PPH in patient records; poor monitoring (and recording) of vital signs (e.g. just 67 percent of cases of PPH had blood pressure recorded in patient records; 87 percent of hypertensive disorders; 82 percent of maternal infections). Uterotonics were provided (and recorded) in just 56 percent of PPH cases; only 34 percent of women with hypertensive disorders received a loading dose of magnesium sulphate; and 69 percent of women with sepsis received ampicillin or cephalosporins.

Recommendations:

- Improve management of haemorrhage by implementing targeted interventions, preferably designing a training that can be provided to most providers over a short time period. The training packages can address PPH, hypertensive disorders, obstructed labour, and sepsis. Consider also including common newborn causes of death.
- Develop, test, and roll-out training materials that can be used for different types of professionals, and which are appropriately relevant for the multi-professional teams that are widely present in health facilities. A key message must be proper and complete record-keeping.
- For PPH, early treatment with intravenous fluids, plasma expanders and oxytocics as well as bimanual uterine compression are needed.

- In cases of pre-eclampsia testing urine for protein and measuring input and output of fluids must be improved. This will increase awareness of correct fluid management and help avoid cerebral oedema.
- In cases of sepsis there is a need to improve early recording of vital signs to improve diagnosis and allow appropriate prompt antibiotic treatment.
- Strengthen use of job aids.

Non-universal implementation of MDSR: The MDSR initiative is well established; however, there is still a gap in implementing the initiative across all facilities and woredas, zones and regions. Only 69 percent of all facilities had initiated MDSR implementation with low performance in Afar, Somali, Gambella, and Benishangul-Gumuz (< 30 percent). Registration of maternal death by cause was reported in only 22 percent of facilities and only 39 percent of the facilities reported that they conducted routine newborn or stillbirth audits.

Recommendations:

- Ensure MDSR is initiated in all facilities.
- Strong emphasis should be given to those emerging regions that are struggling to implement the MDSR system including orientation and availability of the different forms/registration systems.
- Ensure documentation and accountability across the facilities implementing MDSR.
- Conduct further analysis of the MDSR survey data together with the EmONC assessment to triangulate findings and explore the root causes of the problems.

Unacceptably high mortality rate among newborns suffering from breathing disorders, even those of normal weight and at full term: The mortality rate among newborns with breathing difficulties was 44 percent among the 2,433 cases reviewed, even among newborns of normal weight and at full term. Mortality was higher in health centres/clinics (47 percent) than in hospitals/MCH specialty centres. Only 18 percent of cases reviewed received oxygen. Inadequate infrastructure may also be a factor: between 11 and 24 percent of hospitals/specialty centres reported an interruption in safe oxygen supply in the last 12 months, and between 7 and 19 percent of them indicated the interruption was due to irregularity of electricity. Although filled oxygen cylinders were reported by about 90 percent of hospitals, only 31 percent of health centres reported having oxygen and only 8 percent had tubing to administer oxygen. Furthermore, just 17 percent of all mid-level facilities (health centres/clinics) reported having the required staff to administer oxygen to newborns.

Recommendations:

- Training of care providers at the time of delivery in neonatal resuscitation is indicated. This can be integrated with the targeted training for the common causes of maternal death (haemorrhage, hypertensive disorders and sepsis).
- An increase in the availability of oxygen supplies is warranted as is training in the safe use of oxygen.
- Immediate neonatal care appears to be deficient but further investigation would help identify major contributory factors.

Gaps in quality of care for mothers and preterm and LBW babies: Only 5 percent of mothers of preterm and low birth weight babies received antenatal corticosteroids (provision of corticosteroids among women in private-for-profit facilities was substantially higher at 22 percent); just under half of cases indicated that KMC was initiated. Incubators were found in only 11 percent of facilities, largely hospitals. Recording of pertinent information in patient records for this vulnerable population was poor.

Recommendations:

- Training of staff about antenatal corticosteroids and availability of the drug must be increased.
- Kangaroo mother care must be more extensively used, especially in facilities with no functional incubator.
- All newborns who are in-patients in health facilities must have a daily monitoring chart.
- Either limit the amount of information requested in patient records or provide better supervision and support to improve record-keeping.

High stillbirth rate in EmONC facilities: The stillbirth rate was 39 per 1,000 deliveries in EmONC facilities (51 at EmONC hospitals/MCH specialty centres). The registration system does not distinguish between fresh and macerated stillbirths, which means preventative actions for facilities are harder to identify. The combination of a high number of stillbirths, relatively few neonatal deaths, and low availability of emergency newborn care suggests the possibility that neonatal deaths have been reported as stillbirths.

Recommendations:

- Raise awareness and urgency around the problem of stillbirths.
- Develop a set of national stillbirth indicators that distinguishes between intrapartum/fresh and antepartum/macerated stillbirths. Include these in the HMIS.
- Make better use of the Perinatal Guidelines within the MPDSR system.
- Investigate the possibility of misclassifying early neonatal deaths as stillbirths.
- Further explore the efficiency of people going to the right level of facility. Elevate availability and readiness of BEmONC facilities.

Promote simple actions to increase respectful maternity care: The assessment documented that women had to share beds, deliver or sleep on the floor. Eighty-three percent of the facilities had curtains for client's privacy; 9 percent of the facilities reported that women shared beds before or after delivery; 9 percent reported that women slept on the floor; and 6 percent of facilities reported that women delivered on the floor. These problems were particularly apparent in referral and general hospitals.

Recommendations:

- Increasing the number of beds at facilities where these problems have been observed is mandatory to ensure a basic level of respectful maternity care and physical comfort.
- Prepare a geospatial (GIS) analysis of which types of facilities and their locations that should be targeted for these improvements.

Poor record-keeping and incomplete HMIS: This assessment is not the first study to provide strong evidence of poor record-keeping. Without accurate complete record-keeping, indicators are unreliable,

programs or interventions may be inappropriately conceived, and progress cannot be measured. The case reviews, often based on patient notes and records, provided some of the best evidence of how widespread the problem is. Critical quality indices were not recorded, for example, in the caesarean delivery records, e.g. time of decision for caesarean, time of incision, parity, and even indication. Perhaps the most egregious example was the lack of information on causes for maternal death. Fifty-two percent of maternal deaths had no cause recorded in the register, and a similar percentage (47 percent) had no cause of death recorded in patient notes used for the maternal death reviews. Often facilities did not use certain registers and logbooks: just 56 percent of facilities used a referral register, 53 percent used a safe abortion/post abortion register, and 14 percent used a discharge register. Even when registers were in place they were not always complete or up-to-date, for example, among facilities with a labour and delivery register, only 35 percent were complete and 87 percent up-to-date. This leads to issues of under-reporting of complications, critical to measuring met need for EmONC and case fatality rates. These record-keeping efforts form the basis for the HMIS and perhaps it should not be surprising that when data collectors observed the most recent eHMIS MNH report, completeness was observed in only 74% of woredas, 63% of zones, and 60% of regions.

Recommendations:

- Focus on the importance of accurate record-keeping in all trainings and supportive supervision. To the extent that the safe childbirth checklist and safe surgery checklist record these important indicators, emphasize them in trainings.
- Quality improvement exercises for record-keeping – such as audits with feedback – are known to be very effective at improving the recording of critical client data.
- Incorporate record-keeping into QI collaboratives to instil motivation and accountability.
- Print and provide registers and provide associated orientation on use of registers.
- Prioritize the referral register for distribution and use.
- Institute mechanisms to enforce (monthly) reporting. For example, liaise with the Ministry around the electronic programme between facilities and the Ministry, or employ a response officer to enforce reporting.
- A better understanding of why HMIS reports are found to be incomplete is needed. Is it poor record keeping on the part of staff, poor data management, the irregularity of reporting, lack of training or supervision, lack of human resources?
- Improvement in the registration system and recording of causes of death. Specifically, look at the discharge register and vital registration system.
- Further analysis on recording quality by facility type, volume of deliveries (high or low), number of staff in facilities, and managing authority would be useful in understanding who needs to be targeted first and should inform recommendations.

14.6 Referral and maternity waiting homes/rooms: Problems identified and their recommendations for action

Management of the emergency referral system at the health facility level: National guidelines stipulate a liaison officer for referral at all hospitals and presence of an officer was high at referral hospitals (77 percent) but low at primary hospitals (27 percent). National guidance to health centres is less clear, where almost a quarter had no one person in charge of referral. Written guidelines help standardize clinical

management for referral and the use of ambulances. However, 60 percent of facilities that referred clients to higher levels had no written guidelines for pre-referral case management and only 50 percent of facilities that received referrals had definitive treatment guidelines and 29 percent had a triage team. Among facilities with a functional ambulance, only 26 percent had guidelines for the ambulance. Facility staff reported multiple reasons for using the ambulance unrelated to emergency transport: 48 percent carried clients home, 25 percent used ambulances for immunization campaigns, 23 percent picked up supplies, and 20 percent each carried corpses or used the ambulance for community outreach.

Recommendations:

- The national guidelines for referral networking, clinical case management for referral, and ambulance use should be available in all health facilities and should extend to health centres since they are expected to provide BEmONC and treat obstetric and newborn complications. This includes identifying individuals whose job description includes organizing emergency referral.
- Ensure the appropriate implementation of guidelines across the whole health system.

Greater facilitation of referral can enhance quality of case management: In addition to guidelines for pre-referral and definitive treatment, referral "facilitators" exist to improve and monitor the care that referred clients receive, such as a referral form that accompanies the referral client, a medical escort, telephone alert calls to the receiving facility that a case will be sent, feedback to the facility who sent her, a triage system in place on arrival, and a monitoring system that tracks who is referred out, why, when as well as when referral clients are admitted and from where. Very few facilities routinely carried out these "best practices:" 65 percent of facilities never called ahead. Most facilities reported that they used referral slips, but when asked if clients arrived with such forms, only 65 percent of facilities reported that they "usually or sometimes" received them, and forms frequently were not standardized. Feedback was much less frequent. Half of facilities reported that they sent a medical escort but faced difficulties due to lack of staff.

Recommendations:

- Harmonizing practices across facility level, and if not nationally, within regions, through directives, guidelines, supplies and job aids, and training should increase efficiency and the effectiveness of referral processes.
- District, zonal and regional staff could provide supervisory support.
- Using the HMIS to gather information on referrals out and in will help track demand and enhance decision-making.

Barriers women face to using the referral system: Despite efforts to increase access to ambulances, 33 percent of facilities assumed that clients would provide their own transport. Even though a woman might require referral to a higher level, 22 percent of facilities (considerably higher among hospitals) said that expenses had to be cleared before they were referred. On arrival, 27 percent of general hospitals required payment of expenses prior to treatment. Private-for-profit and not-for-profit facilities were more likely to report payment requirements than public facilities.

Recommendation:

- It is not clear why so many facilities expect clients to assume responsibility for emergency referral. Communication efforts to ensure that communities know that transport is available to them through the woreda-based ambulance system may help, as might pro-poor policy strategies, especially so that mothers and newborns faced with life-threatening problems are not deterred from timely care because of lack of payment of expenses.

Women experience substantial delays in receiving definitive care: In forty percent of maternal deaths reviewed, delay in arrival at the first health facility was a contributing factor; in 29 percent, delayed transfer played a role. There was a small reduction between 2008 and 2016 in the percent of deaths reviewed that had been referred from the community or from another facility, possibly reflecting improved access to a functioning facility as a result of the facility expansion during the 8 years between surveys.

Recommendations:

- Further roll-out of national referral guidelines across the health service level.
- Continue to work with health extension program to address the first delay (with the HEWs and volunteers).

Lack of availability of emergency transport. Facilities use a mix of strategies for emergency transport: Only 17 percent of facilities had their own functional and motorized transport (and most were poorly equipped), while about a third had some form of motorized transportation, half of which had at least one driver on staff. About 60 percent of facilities said that they used the vehicle from the District Health Office; this use was highest among health centres and primary hospitals. Meanwhile, 55 districts (7 percent) reported that they had no ambulance.

Recommendations:

- Ambulances supported by the District Health Offices may be underutilized if only 62 percent of facilities report using them. Regions with heavy use of DHO ambulances and low percentages of on-site ambulances such as Oromia, SNNP, and Gambella must be monitored carefully to ensure they have sufficient transport.
- The ministry or RHBs may want to explore alternative modes of transport (rather than specialized ambulances) to carry women home after delivery, an important service for women transitioning to delivering at facilities and limited transportation options.
- Ambulances should be available in all districts and health facilities.
- Vehicles should have emergency equipment, supplies, drugs, and drivers trained in first aid. Emphasis should be placed on the management of obstetric haemorrhage, hypertensive disorders in pregnancy, and prolonged and obstructed labour.

Lack of availability of MWHs: Nearly half of all health facilities had no MWH; Gambella had none while Afar and Somali had very few (5 and 11, respectively). The percent of facilities in these regions that are located more than 50 km from the closest facility with specialized obstetric or newborn care was high, making access in case of an emergency all the more difficult. More than half of the existing MWHs were single rooms within the health facility. The women residents in the MWHs who were interviewed reported that they travelled an average of 5 hours.

Recommendations:

- All health facilities should have a stand-alone MWH with a minimum of 3 rooms (2 ANC + 1 PNC). Efforts should be focused especially on Gambella, Afar, and Somali. Meeting this recommendation in Harari, Dire Dawa, and Addis Ababa—with their small rural populations and better access to facilities—may not be as critical as more populous rural regions, unless they also serve outlying rural communities.
- Local NGOs and communities may be able to provide support to help facilities establish a stand-alone MWH, using local construction materials and labour.
- Given the distances from home and the risks to mother and baby immediately postpartum, women should be encouraged to remain at the MWH for some time (12-24 hours at least) after birth.
- Determine to what extent MWHs influence institutional delivery. It may be necessary to collect more data to test this assumption.

Many MWHs lack basic amenities and services: MWHs often lacked basic amenities such as water (43 percent without water), electricity (27 percent without), and toilets (25 percent without). They provided minimal comfort or privacy: only 58 percent could offer a bed with a mattress, and of the 45 percent of MWHs where sleeping space was shared, only 11 percent offered women a means of privacy. Sixteen percent of MWHs and rooms (36 percent at hospitals) did not provide food. Although not investigated in this study, cooking rooms are an amenity that women have identified as improving MWH conditions according to local experts.

Recommendations:

- Ensure MWHs have necessary infrastructure like water, electricity, latrines, and cooking space.
- As noted above, local NGOs and communities may be able to provide support for infrastructure upgrades in MWHs.

Sub-standard care for women who stay at MWHs: Although most MWHs provided some sort of health education (88 percent), only 27 percent reported that they had provided an educational session the day before the visit to the facility. Among the women residents who were interviewed, 74 percent said that a health worker had visited them in the last 24 hours, but 16 percent had not been visited in over 2 days and 5 percent said they had never been visited.

Recommendations:

- All pregnant and postpartum MWH residents should be checked by a nurse or midwife daily.
- The opportunity to provide educational messages on infant care, breastfeeding, postpartum care, and other topics should not be lost.
- All woredas should have guidelines and policies (70 percent do not) regarding how MWHs should operate, and health officials should make supportive visits to MWHs to heighten their profile, encourage improvements, and garner support.

Appendix A: Tables

Table 3.1.1A: Distribution of facilities according to EmONC status, by facility type, region, managing authority, and location, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres					Health centres/clinics[1]					All facilities				
	CEmONC	BEmONC	Partially functioning[2]	Non-EmONC[3]	Total	CEmONC	BEmONC	Partially functioning[2]	Non-EmONC[3]	Total	CEmONC	BEmONC	Partially functioning[2]	Non-EmONC[3]	Total
National	142	43	127	4	316	6	179	3,268	35	3,488	148	222	3,395	39	3,804
Region															
Tigray	15	10	15	0	40	1	18	195	1	215	16	28	210	1	255
Afar	3	0	4	0	7	0	2	59	9	70	3	2	63	9	77
Amhara	26	6	25	1	58	0	69	746	3	818	26	75	771	4	876
Oromia	47	10	20	0	77	1	53	1,270	4	1,328	48	63	1,290	4	1,405
Somali	7	1	2	0	10	2	10	131	8	151	9	11	133	8	161
Benishangul-Gumuz	2	0	1	0	3	0	2	38	0	40	2	2	39	0	43
SNNP	23	12	23	2	60	1	6	699	7	713	24	18	722	9	773
Gambella	1	0	0	0	1	0	0	23	3	26	1	0	23	3	27
Harari	3	0	4	0	7	0	0	8	0	8	3	0	12	0	15
Addis Ababa	14	4	29	0	47	1	19	84	0	104	15	23	113	0	151
Dire Dawa	1	0	4	1	6	0	0	15	0	15	1	0	19	1	21
Managing authority															
Public/government	122	39	73	2	236	3	171	3,218	34	3,426	125	210	3,291	36	3,662
Private-for-profit	14	2	43	2	61	1	6	14	1	22	15	8	57	3	83
Private-not-for-profit[4]	6	2	11	0	19	2	2	36	0	40	8	4	47	0	59
Location															
Urban	135	41	114	3	293	6	108	1,082	8	1,204	141	149	1,196	11	1,497
Rural	7	2	13	1	23	0	71	2,186	27	2,284	7	73	2,199	28	2,307

[1] Includes MCH specialty clinics and higher clinics.

[2] Partially functioning indicates those facilities providing some signal functions but missing at least one BEmONC signal function.

[3] Non-EmONC indicates those facilities providing no EmONC signal functions.

[4] Includes NGO, faith-based, or mission facilities.

Table 3.3.2A: Percent distribution of institutional deliveries according to region, by facility type, EmONC status, managing authority, and location, Ethiopia EmONC, 2016

	National	Region										
		Tigray	Afar	Amhara	Oromia	Somali	Benishangul-Gumuz	SNNP	Gambella	Harari	Addis Ababa	Dire Dawa
Total deliveries	1,924,330	113,425	7,678	386,131	844,287	22,036	12,288	417,697	3,383	7,579	101,401	8,425
Facility type												
Referral/specialized hospitals	5%	2%	0%	6%	3%	0%	0%	3%	0%	36%	33%	41%
General hospitals	7%	22%	10%	2%	5%	34%	27%	6%	51%	36%	13%	15%
Primary hospitals	5%	16%	12%	4%	4%	5%	0%	8%	0%	0%	0%	9%
MCH specialty centres	1%	0%	7%	0%	0%	0%	0%	0%	0%	3%	15%	0%
Health centres	81%	60%	71%	88%	88%	53%	73%	83%	49%	25%	38%	35%
MCH specialty clinics	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Higher clinics	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
EmONC status												
Partially functioning/non-EmONC	80%	63%	71%	81%	83%	44%	69%	86%	49%	36%	54%	59%
BEmONC	7%	14%	6%	9%	6%	15%	4%	3%	0%	0%	20%	0%
CEmONC	13%	23%	23%	10%	10%	40%	27%	11%	51%	64%	26%	41%
Managing authority												
Public/government	97%	100%	93%	99%	98%	87%	95%	97%	93%	81%	75%	87%
Private-for-profit	1%	0%	0%	0%	0%	7%	0%	0%	0%	15%	20%	13%
Private-not-for-profit[1]	2%	0%	7%	0%	1%	6%	5%	3%	7%	3%	5%	0%
Location												
Urban	50%	60%	57%	49%	45%	72%	71%	45%	63%	92%	96%	98%
Rural	50%	40%	43%	51%	55%	28%	29%	55%	37%	8%	4%	2%

[1] Includes NGO, faith-based, or mission facilities.

Table 3.4.1A: Percent of women expected to experience major direct obstetric complications who developed complications and delivered in all facilities and EmONC facilities (EmONC Indicator 4 - Met Need), by region, Ethiopia EmONC, 2016

			All facilities		EmONC facilities	
	Expected births[1]	Expected complications[2]	Number of women with major DOCs[3] that deliver in all facilities	Met need	Number of women with major DOCs[3] that deliver in EmONC facilities	Met need
National	2,928,303	439,245	78,852	18%	38,196	9%
Region						
Tigray	163,802	24,570	8,012	33%	4,085	17%
Afar	56,222	8,433	611	7%	396	5%
Amhara	660,518	99,078	18,406	19%	7,675	8%
Oromia	1,099,485	164,923	22,667	14%	11,532	7%
Somali	178,048	26,707	1,726	6%	1,298	5%
Benishangul-Gumuz	32,913	4,937	1,229	25%	1,008	20%
SNNP	595,296	89,294	11,087	12%	6,000	7%
Gambella	13,420	2,013	64	3%	57	3%
Harari	7,568	1,135	767	68%	704	62%
Addis Ababa	106,625	15,994	13,244	83%	4,829	30%
Dire Dawa	14,405	2,161	1,039	48%	612	28%

DOC = direct obstetric complication.

[1] Expected births are calculated as (population) * (crude birth rate). Population source: FMOH, Health and Health Related Indicators, 2016. Crude birth rate = 31.8 per 1,000 population for national and all regions. Crude birth rate source: Ethiopia Demographic and Health Survey - Key Indicators 2016; Addis Ababa, October 2016.

[2] Expected complications are calculated as 15% of the number of expected births.

[3] Major DOCs include: ruptured uterus, postpartum sepsis, severe pre-eclampsia/eclampsia, severe complications of abortion, antepartum haemorrhage, obstructed/prolonged labour, postpartum haemorrhage/retained placenta, and ectopic pregnancy (excludes "other" DOCs).

Table 3.4.2A: Percent of women expected to experience major direct obstetric complications (+ PAC cases) who developed complications and delivered in all facilities and EmONC facilities (EmONC Indicator 4 - Met Need with PAC), by region, Ethiopia EmONC, 2016

			All facilities		EmONC facilities		All facilities		EmONC facilities	
	Expected births[1]	Expected complications[2]	Number of women with major DOCs[3] that deliver in all facilities	Met need	Number of women with major DOCs[3] that deliver in EmONC facilities	Met need	Number of women with major DOCs[3] (+PAC) that deliver in all facilities	Met need	Number of women with major DOCs[3] (+PAC) that deliver in EmONC facilities	Met need
National	2,928,303	439,245	78,852	18%	38,196	9%	129,083	29%	66,693	15%
Region										
Tigray	163,802	24,570	8,012	33%	4,085	17%	13,243	54%	6,994	28%
Afar	56,222	8,433	611	7%	396	5%	872	10%	529	6%
Amhara	660,518	99,078	18,406	19%	7,675	8%	27,041	27%	11,910	12%
Oromia	1,099,485	164,923	22,667	14%	11,532	7%	40,006	24%	21,699	13%
Somali	178,048	26,707	1,726	6%	1,298	5%	2,309	9%	1,800	7%
Benishangul-Gumuz	32,913	4,937	1,229	25%	1,008	20%	1,588	32%	1,121	23%
SNNP	595,296	89,294	11,087	12%	6,000	7%	20,210	23%	11,299	13%
Gambella	13,420	2,013	64	3%	57	3%	341	17%	269	13%
Harari	7,568	1,135	767	68%	704	62%	1,828	161%	1,491	131%
Addis Ababa	106,625	15,994	13,244	83%	4,829	30%	20,092	126%	8,589	54%
Dire Dawa	14,405	2,161	1,039	48%	612	28%	1,553	72%	992	46%

DOC = direct obstetric complication; PAC = post-abortion care.

[1] Expected births are calculated as (population) * (crude birth rate). Population source: FMOH, Health and Health Related Indicators, 2016. Crude birth rate = 31.8 per 1,000 population for national and all regions. Crude birth rate source: Ethiopia Demographic and Health Survey - Key Indicators 2016; Addis Ababa, October 2016.

[2] Expected complications are calculated as 15% of the number of expected births.

[3] Major DOCs include: ruptured uterus, postpartum sepsis, severe pre-eclampsia/eclampsia, severe complications of abortion, antepartum haemorrhage, obstructed/prolonged labour, postpartum haemorrhage/retained placenta, and ectopic pregnancy (excludes "other" DOCs).

Table 3.4.4A: Percent of facilities with complete and up-to-date registers (labour and delivery, post-abortion care, operating theatre), by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Labour and delivery register			Post-abortion-care register			Operating theatre register		
	Facilities with register	Register complete	Register up-to-date	Facilities with register	Register complete	Register up-to-date	Facilities with register	Register complete	Register up-to-date
	n	%	%	n	%	%	n	%	%
National	3,784	35%	87%	2,024	41%	66%	295	63%	81%
Region									
Tigray	254	55%	95%	222	63%	90%	40	80%	85%
Afar	73	29%	95%	26	54%	73%	6	67%	100%
Amhara	871	32%	82%	489	42%	66%	53	62%	75%
Oromia	1,402	29%	87%	725	30%	56%	71	49%	72%
Somali	156	33%	67%	37	30%	32%	10	60%	60%
Benishangul-Gumuz	42	48%	57%	24	46%	46%	2	100%	100%
SNNP	772	41%	93%	367	53%	70%	54	72%	89%
Gambella	27	11%	81%	10	0%	60%	1	0%	100%
Harari	15	7%	93%	14	7%	57%	6	33%	100%
Addis Ababa	151	48%	90%	92	46%	79%	46	67%	87%
Dire Dawa	21	5%	95%	18	6%	83%	6	17%	100%
Facility type									
Hospitals/MCH specialty centres	315	44%	90%	264	51%	84%	262	63%	85%
Health centres/clinics[1]	3,469	34%	86%	1,760	40%	63%	33	58%	48%
Managing authority									
Public/government	3,644	35%	87%	1,944	42%	66%	223	62%	80%
Private-for-profit	81	30%	75%	54	28%	70%	58	60%	81%
Private-not-for-profit[2]	59	49%	85%	26	42%	58%	14	86%	100%
Location									
Urban	1,494	38%	87%	1,095	47%	74%	265	63%	84%
Rural	2,290	32%	86%	929	35%	56%	30	60%	60%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 3.5.1A: Percent of expected births delivered by caesarean section in all facilities and EmONC facilities (EmONC Indicator 5), by region, Ethiopia EmONC, 2016

		All facilities		EmONC facilities	
	Expected births[1]	Number of CSs	Percent of expected births by CS	Number of CSs	Percent of expected births by CS
National	2,928,303	78,916	3%	58,832	2%
Region					
Tigray	163,802	5,404	3%	4,575	3%
Afar	56,222	229	0%	169	0%
Amhara	660,518	10,963	2%	9,211	1%
Oromia	1,099,485	19,240	2%	17,489	2%
Somali	178,048	527	0%	527	0%
Benishangul-Gumuz	32,913	700	2%	700	2%
SNNP	595,296	12,863	2%	10,694	2%
Gambella	13,420	135	1%	135	1%
Harari	7,568	1,296	17%	1,107	15%
Addis Ababa	106,625	26,138	25%	13,290	12%
Dire Dawa	14,405	1,421	10%	935	6%

CS = caesarean section.

[1] Expected births are calculated as (population) * (crude birth rate). Population source: FMOH, Health and Health Related Indicators, 2016. Crude birth rate = 31.8 per 1,000 population for national and all regions. Crude birth rate source: Ethiopia Demographic and Health Survey - Key Indicators 2016; Addis Ababa, 2016.

Table 3.7.1A: Stillbirth, very early neonatal, and neonatal death rates in all facilities, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of deliveries in all facilities	Number of stillbirths in all facilities	Stillbirth rate (per 1,000 deliveries)	Number of live births	Number of very early neonatal deaths (1st 24 hours)	Very early neonatal death rate (per 1,000 live births)	Number of early neonatal deaths (1 to <7 days)	Number of neonatal deaths (7 to <28 days)	Number of neonatal deaths (0 to <28 days)	Neonatal death rate (0 to <28 days; per 1,000 live births)
National	1,924,330	28,670	14.9	1,897,829	3,592	1.9	1,742	445	5,779	3.0
Region										
Tigray	113,425	2,219	19.6	113,338	409	3.6	153	45	607	5.4
Afar	7,678	263	34.3	7,292	48	6.6	5	2	55	7.5
Amhara	386,131	6,674	17.3	373,935	950	2.5	297	81	1,328	3.6
Oromia	844,287	10,808	12.8	839,961	945	1.1	382	88	1,415	1.7
Somali	22,036	649	29.5	21,448	48	2.2	18	6	72	3.4
Benishangul-Gumuz	12,288	379	30.8	12,223	65	5.3	31	2	98	8.0
SNNP	417,697	4,802	11.5	411,720	550	1.3	279	86	915	2.2
Gambella	3,383	70	20.7	3,150	7	2.2	19	1	27	8.6
Harari	7,579	448	59.1	7,005	22	3.1	0	0	22	3.1
Addis Ababa	101,401	2,079	20.5	99,528	529	5.3	558	134	1,221	12.3
Dire Dawa	8,425	279	33.1	8,229	19	2.3	0	0	19	2.3
Facility type										
Hospitals/MCH specialty centres	352,682	16,861	47.8	341,529	2,418	7.1	1,724	436	4,578	13.4
Health centres/clinics[1]	1,571,648	11,809	7.5	1,556,300	1,174	0.8	18	9	1,201	0.8
Managing authority										
Public/government	1,861,793	27,309	14.7	1,836,064	3,461	1.9	1,724	428	5,613	3.1
Private-for-profit	28,489	490	17.2	27,818	66	2.4	5	4	75	2.7
Private-not-for-profit[2]	34,048	871	25.6	33,947	65	1.9	13	13	91	2.7
Location										
Urban	971,504	22,184	22.8	957,717	2,802	2.9	1,704	420	4,926	5.1
Rural	952,826	6,486	6.8	940,112	790	0.8	38	25	853	0.9

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 3.7.2A: Stillbirth, very early neonatal, and neonatal death rates in EmONC facilities, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of deliveries in EmONC facilities	Number of stillbirths in EmONC facilities	Stillbirth rate (per 1,000 deliveries)	Number of live births	Number of very early neonatal deaths (1st 24 hours)	Very early neonatal death rate (per 1,000 live births)	Number of early neonatal deaths (1 to <7 days)	Number of neonatal deaths (7 to <28 days)	Number of neonatal deaths (0 to <28 days)	Neonatal death rate (0 to <28 days; per 1,000 live births)
National	390,113	15,272	39.1	381,065	2,113	5.5	1,411	327	3,851	10.1
Region										
Tigray	41,823	1,237	29.6	41,454	295	7.1	149	33	477	11.5
Afar	2,223	145	65.2	2,109	27	12.8	5	2	34	16.1
Amhara	74,996	3,165	42.2	72,442	488	6.7	283	74	845	11.7
Oromia	140,220	5,485	39.1	137,225	527	3.8	362	79	968	7.1
Somali	12,289	498	40.5	11,868	30	2.5	15	4	49	4.1
Benishangul-Gumuz	3,842	163	42.4	3,847	31	8.1	31	2	64	16.6
SNNP	57,668	2,811	48.7	56,316	392	7.0	229	71	692	12.3
Gambella	1,729	52	30.1	1,667	3	1.8	19	1	23	13.8
Harari	4,851	431	88.8	4,279	22	5.1	0	0	22	5.1
Addis Ababa	46,986	1,088	23.2	46,532	286	6.1	318	61	665	14.3
Dire Dawa	3,486	197	56.5	3,326	12	3.6	0	0	12	3.6
Facility type										
Hospitals/MCH specialty centres	273,430	14,122	51.6	264,983	2,010	7.6	1,411	326	3,747	14.1
Health centres/clinics[1]	116,683	1,150	9.9	116,082	103	0.9	0	1	104	0.9
Managing authority										
Public/government	360,747	14,431	40.0	351,763	2,057	5.8	1,404	324	3,785	10.8
Private-for-profit	11,849	235	19.8	12,027	25	2.1	3	1	29	2.4
Private-not-for-profit[2]	17,517	606	34.6	17,275	31	1.8	4	2	37	2.1
Location										
Urban	348,965	14,592	41.8	340,016	2,015	5.9	1,389	319	3,723	10.9
Rural	41,148	680	16.5	41,049	98	2.4	22	8	128	3.1

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 3.7.3A: Preterm birth rate and low and very low birth weight rates, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	All live births	Preterm live births (<37 weeks)		All live births with specified weight	Low birth weight (<2,500 grams)		Very low birth weight (<1,500 grams)	
	n	n	Rate[1]	n	n	Rate[2]	n	Rate[2]
National	1,897,829	8,570	4.5	1,867,443	49,201	26.3	4,225	2.3
Region								
Tigray	113,338	400	3.5	112,803	4,574	40.5	365	3.2
Afar	7,292	3	0.4	7,096	417	58.8	38	5.4
Amhara	373,935	4,612	12.3	365,747	11,643	31.8	934	2.6
Oromia	839,961	1,077	1.3	825,969	15,683	19.0	1,177	1.4
Somali	21,448	24	1.1	20,819	982	47.2	131	6.3
Benishangul-Gumuz	12,223	54	4.4	11,948	530	44.4	54	4.5
SNNP	411,720	875	2.1	406,138	6,282	15.5	583	1.4
Gambella	3,150	3	1.0	3,144	134	42.6	22	7.0
Harari	7,005	19	2.7	6,874	430	62.6	42	6.1
Addis Ababa	99,528	1,491	15.0	98,743	8,059	81.6	829	8.4
Dire Dawa	8,229	12	1.5	8,162	467	57.2	50	6.1
Facility type								
Hospitals/MCH specialty centres	341,529	4,445	13.0	337,422	26,745	79.3	2,976	8.8
Health centres/clinics[3]	1,556,300	4,125	2.7	1,530,021	22,456	14.7	1,249	0.8
Managing authority								
Public/government	1,836,064	8,337	4.5	1,806,164	46,018	25.5	3,928	2.2
Private-for-profit	27,818	212	7.6	27,550	1,462	53.1	194	7.0
Private-not-for-profit[4]	33,947	21	0.6	33,729	1,721	51.0	103	3.1
Location								
Urban	957,717	6,040	6.3	942,401	36,623	38.9	3,593	3.8
Rural	940,112	2,530	2.7	925,042	12,578	13.6	632	0.7

[1] Rate is per 1,000 live births.

[2] Rate is per 1,000 live births where weight was specified.

[3] Includes MCH specialty clinics and higher clinics.

[4] Includes NGO, faith-based, or mission facilities.

Table 3.7.4A: Percent of newborns initiating kangaroo mother care and receiving resuscitation with bag and mask, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	All live births	Newborns initiating KMC		Newborns receiving resuscitation with bag and mask	
	n	n	%	n	%
National	1,897,829	48,834	3%	15,267	1%
Region					
Tigray	113,338	1,735	2%	1,904	2%
Afar	7,292	29	0%	37	1%
Amhara	373,935	20,263	5%	3,789	1%
Oromia	839,961	19,836	2%	4,057	0%
Somali	21,448	407	2%	110	1%
Benishangul-Gumuz	12,223	105	1%	199	2%
SNNP	411,720	4,899	1%	1,920	0%
Gambella	3,150	13	0%	1	0%
Harari	7,005	37	1%	152	2%
Addis Ababa	99,528	1,454	1%	2,861	3%
Dire Dawa	8,229	56	1%	237	3%
Facility type					
Hospitals/MCH specialty centres	341,529	4,699	1%	7,269	2%
Health centres/clinics[1]	1,556,300	44,135	3%	7,998	1%
Managing authority					
Public/government	1,836,064	48,717	3%	14,911	1%
Private-for-profit	27,818	104	0%	290	1%
Private-not-for-profit[2]	33,947	13	0%	66	0%
Location					
Urban	957,717	18,648	2%	10,875	1%
Rural	940,112	30,186	3%	4,392	0%

KMC = kangaroo mother care.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 3.8.1A: Percent of maternal deaths due to indirect causes in all facilities and EmONC facilities (EmONC Indicator 8), by region, Ethiopia EmONC, 2016

	All facilities			EmONC facilities		
	Maternal deaths[1]	Maternal deaths due to indirect causes[2]		Maternal deaths[1]	Maternal deaths due to indirect causes[2]	
	n	n	%	n	n	%
National	1,305	59	5%	584	43	7%
Region						
Tigray	44	5	11%	33	3	9%
Afar	19	4	21%	12	4	33%
Amhara	391	8	2%	126	6	5%
Oromia	457	19	4%	184	12	7%
Somali	80	5	6%	45	5	11%
Benishangul-Gumuz	20	1	5%	7	0	0%
SNNP	184	12	7%	100	8	8%
Gambella	6	0	0%	6	0	0%
Harari	43	0	0%	40	0	0%
Addis Ababa	52	5	10%	24	5	21%
Dire Dawa	9	0	0%	7	0	0%

[1] Includes all recorded maternal deaths in facilities regardless of cause (including unknown causes).

[2] Includes maternal deaths due to malaria, HIV-AIDS related, anaemia, hepatitis, and other indirect causes.

Table 4.1.1A: Percent of facilities that performed each EmONC signal function in the last 3 months, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Parenteral antibiotics	Parenteral uterotonics	Parenteral anticonvulsants	Manual removal of placenta	Removal of retained products	Assisted vaginal delivery	Caesarean delivery	Blood transfusion
National	3,804	80%	93%	26%	62%	42%	35%	7%	6%
Region									
Tigray	255	85%	97%	41%	65%	46%	46%	13%	8%
Afar	77	83%	62%	16%	44%	31%	23%	9%	4%
Amhara	876	84%	94%	29%	68%	49%	45%	5%	4%
Oromia	1,405	80%	95%	23%	61%	43%	30%	5%	4%
Somali	161	84%	84%	45%	47%	32%	26%	6%	8%
Benishangul-Gumuz	43	81%	93%	33%	60%	53%	40%	5%	5%
SNNP	773	71%	92%	17%	60%	33%	26%	6%	4%
Gambella	27	59%	78%	11%	48%	15%	11%	4%	4%
Harari	15	73%	100%	27%	40%	47%	73%	40%	27%
Addis Ababa	151	96%	94%	51%	65%	56%	60%	30%	25%
Dire Dawa	21	86%	95%	24%	33%	57%	29%	24%	19%
Facility type									
Hospitals/MCH specialty centres	316	96%	95%	80%	81%	76%	85%	80%	65%
Health centres/clinics[1]	3,488	79%	93%	22%	60%	39%	30%	1%	0%
Managing authority									
Public/government	3,662	80%	93%	26%	62%	42%	34%	5%	4%
Private-for-profit	83	93%	88%	53%	54%	47%	64%	67%	59%
Private-not-for-profit[2]	59	81%	93%	39%	61%	47%	49%	27%	20%
Location									
Urban	1,497	86%	94%	37%	70%	56%	50%	17%	14%
Rural	2,307	77%	93%	19%	56%	33%	25%	1%	0%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 4.1.2A: Percent of facilities that performed each EmONC and EmNeC signal function in the last 3 months, and reasons for not performing, by signal function, Ethiopia EmONC, 2016

	Percent of facilities that performed the SF in the last 3 months n=3,804[1]	Number of facilities that did not perform the SF in the last 3 months	Percent of facilities that did not perform the SF in the last 3 months due to:[2] (multiple responses allowed)								
			Lack of staff	Training needed	Lack of supplies/ equipment/ drugs	Weak management	Unsupportive or no policy	Lack of lighting	Lack of electricity	No indication/ clients	Other
EmONC signal functions											
Parenteral antibiotics	80%	751	1%	3%	13%	1%	0%			89%	1%
Parenteral uterotonics	93%	257	3%	7%	34%	2%	3%			62%	1%
Parenteral anticonvulsants	26%	2,802	1%	6%	32%	1%	1%			80%	0%
Manual removal of placenta	62%	1,460	2%	5%	3%	1%	1%			94%	0%
Removal of retained products	42%	2,196	2%	9%	10%	0%	1%	1%	3%	88%	0%
Assisted vaginal delivery	35%	2,483	4%	24%	50%	2%	5%	1%	4%	50%	0%
Caesarean delivery[3]	80%	63	27%	25%	54%	6%	14%	6%	10%	21%	2%
Blood transfusion[3]	65%	112	9%	11%	52%	3%	13%	0%	7%	38%	0%
EmNeC signal functions											
Newborn resuscitation with bag + mask	73%	1,040	1%	3%	9%	0%	1%			92%	0%
Antenatal corticosteroids	9%	3,445	3%	23%	36%	1%	13%			63%	0%
Antibiotics for pPROM	43%	2,171	1%	6%	6%	1%	5%			88%	0%
Antibiotics for neonatal sepsis	33%	2,528	1%	8%	6%	1%	2%			90%	0%
KMC for small babies	49%	1,949	1%	7%	7%	2%	1%			89%	0%
Safe administration of oxygen[3]	81%	59	2%	2%	20%	0%	3%	0%	10%	78%	0%
IV fluids[3]	63%	115	11%	15%	11%	2%	1%			77%	2%

KMC = kangaroo mother care; pPROM = preterm premature rupture of membranes, SF = signal function.

[1] Non-response varies across items and is less than 1.0%. Non-responses are excluded.

[2] Shaded cells indicate that the reason for not providing the SF was not a response option.

[3] Only hospitals and MCH specialty centres (n=316) are included for these analyses.

Table 4.1.3A: Percent of facilities that performed each EmNeC signal function in the last 3 months, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Newborn resuscitation with bag and mask	Antenatal corticosteroids	Antibiotics for pPROM	Antibiotics for neonatal sepsis	KMC for small babies	Safe administration of oxygen	IV fluids
National	3,804	73%	9%	43%	33%	49%	12%	11%
Region								
Tigray	255	83%	13%	60%	33%	65%	16%	11%
Afar	77	42%	12%	25%	23%	29%	8%	19%
Amhara	876	76%	7%	42%	39%	51%	12%	11%
Oromia	1,405	74%	9%	45%	31%	51%	7%	9%
Somali	161	57%	12%	36%	37%	42%	8%	24%
Benishangul-Gumuz	43	88%	5%	40%	26%	42%	7%	9%
SNNP	773	68%	7%	31%	33%	42%	10%	10%
Gambella	27	52%	7%	26%	26%	26%	4%	7%
Harari	15	60%	27%	33%	33%	20%	40%	33%
Addis Ababa	151	81%	26%	81%	32%	49%	64%	21%
Dire Dawa	21	57%	19%	43%	24%	38%	24%	19%
Facility type								
Hospitals/MCH specialty centres	316	90%	59%	84%	71%	65%	81%	63%
Health centres/clinics[1]	3,488	71%	5%	39%	30%	47%	6%	7%
Managing authority								
Public/government	3,662	73%	8%	42%	33%	49%	10%	11%
Private-for-profit	83	67%	40%	64%	43%	29%	61%	29%
Private-not-for-profit[2]	59	66%	27%	47%	31%	53%	32%	20%
Location								
Urban	1,497	79%	16%	56%	40%	52%	25%	18%
Rural	2,307	69%	5%	34%	29%	47%	4%	7%

KMC = kangaroo mother care; pPROM = preterm premature rupture of membranes.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 4.1.4A: Percent distribution of facilities according to EmNeC status, by facility type, region, managing authority, and location, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres				Health centres/clinics[1]				All facilities			
	Number of facilities	Fully EmNeC	Partially functioning[2]	Non-EmNeC[3]	Number of facilities	Fully EmNeC	Partially functioning[2]	Non-EmNeC[3]	Number of facilities	Fully EmNeC	Partially functioning[2]	Non-EmNeC[3]
National	316	35%	61%	4%	3,488	0%	87%	13%	3,804	3%	84%	12%
Region												
Tigray	40	23%	75%	3%	215	0%	92%	8%	255	4%	89%	7%
Afar	7	29%	71%	0%	70	0%	64%	36%	77	3%	65%	32%
Amhara	58	43%	52%	5%	818	0%	90%	10%	876	3%	88%	9%
Oromia	77	40%	60%	0%	1,328	0%	88%	12%	1,405	2%	87%	11%
Somali	10	60%	40%	0%	151	1%	75%	23%	161	5%	73%	22%
Benishangul-Gumuz	3	67%	33%	0%	40	0%	95%	5%	43	5%	91%	5%
SNNP	60	38%	55%	7%	713	0%	81%	19%	773	3%	79%	18%
Gambella	1	0%	100%	0%	26	0%	65%	35%	27	0%	67%	33%
Harari	7	14%	86%	0%	8	0%	75%	25%	15	7%	80%	13%
Addis Ababa	47	21%	72%	6%	104	1%	95%	4%	151	7%	88%	5%
Dire Dawa	6	50%	33%	17%	15	0%	87%	13%	21	14%	71%	14%
Managing authority												
Public/government	236	44%	55%	2%	3,426	0%	87%	13%	3,662	3%	85%	12%
Private-for-profit	61	8%	80%	11%	22	0%	77%	23%	83	6%	80%	14%
Private-not-for-profit[4]	19	21%	74%	5%	40	3%	85%	13%	59	8%	81%	10%
Location												
Urban	293	37%	60%	4%	1,204	0%	89%	11%	1,497	7%	83%	9%
Rural	23	22%	74%	4%	2,284	0%	85%	15%	2,307	0%	85%	15%

[1] Includes MCH specialty clinics and higher clinics.

[2] Partially functioning indicates those facilities providing some signal functions but missing at least one EmNeC signal function.

[3] Non-EmNeC indicates those facilities providing no EmNeC signal functions.

[4] Includes NGO, faith-based, or mission facilities.

Table 4.1.5A: Percent distribution of facilities according to number of EmONC signal functions, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	CEmONC (9 SFs)		BEmONC (7 SFs[1])		Almost there (5-6 SFs[1])		On the way (3-4 SFs[1])		Barely functioning (1-2 SFs[1])		Non-EmONC (0 SFs)		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
National	148	4%	222	6%	1,191	31%	1,557	41%	647	17%	39	1%	3,804	100%
Region														
Tigray	16	6%	28	11%	96	38%	84	33%	30	12%	1	0%	255	100%
Afar	3	4%	2	3%	13	17%	26	34%	24	31%	9	12%	77	100%
Amhara	26	3%	75	9%	339	39%	340	39%	92	11%	4	0%	876	100%
Oromia	48	3%	63	4%	435	31%	603	43%	252	18%	4	0%	1,405	100%
Somali	9	6%	11	7%	32	20%	64	40%	37	23%	8	5%	161	100%
Benishangul-Gumuz	2	5%	2	5%	17	40%	20	47%	2	5%	0	0%	43	100%
SNNP	24	3%	18	2%	194	25%	344	45%	184	24%	9	1%	773	100%
Gambella	1	4%	0	0%	2	7%	13	48%	8	30%	3	11%	27	100%
Harari	3	20%	0	0%	4	27%	5	33%	3	20%	0	0%	15	100%
Addis Ababa	15	10%	23	15%	52	34%	49	32%	12	8%	0	0%	151	100%
Dire Dawa	1	5%	0	0%	7	33%	9	43%	3	14%	1	5%	21	100%
Facility type														
Hospitals/MCH specialty centres	142	45%	43	14%	87	28%	28	9%	12	4%	4	1%	316	100%
Health centres/clinics[2]	6	0%	179	5%	1,104	32%	1,529	44%	635	18%	35	1%	3,488	100%
Managing authority														
Public/government	125	3%	210	6%	1,151	31%	1,512	41%	628	17%	36	1%	3,662	100%
Private-for-profit	15	18%	8	10%	21	25%	28	34%	8	10%	3	4%	83	100%
Private-not-for-profit[3]	8	14%	4	7%	19	32%	17	29%	11	19%	0	0%	59	100%
Location														
Urban	141	9%	149	10%	552	37%	480	32%	164	11%	11	1%	1,497	100%
Rural	7	0%	73	3%	639	28%	1,077	47%	483	21%	28	1%	2,307	100%

SF = signal function.

[1] For BEmONC, almost there, on the way, and barely functioning facilities, the number of SFs is measured among the 7 BEmONC SFs only (i.e. not including caesarean delivery or blood transfusion). For example, if a facility had 6 BEmONC SFs plus caesarean delivery (7 SFs total), they were only counted as having 6 SFs.

[2] Includes MCH specialty clinics and higher clinics.

[3] Includes NGO, faith-based, or mission facilities.

Table 4.1.6A: Percent distribution of facilities according to number of EmNeC signal functions, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Fully EmNeC (7 SFs)		Almost there (5-6 SFs)		On the way (3-4 SFs)		Barely functioning (1-2 SFs)		Non-EmNeC (0 SFs)		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
National	116	3%	231	6%	1,175	31%	1,808	48%	474	12%	3,804	100%
Region												
Tigray	9	4%	25	10%	112	44%	91	36%	18	7%	255	100%
Afar	2	3%	5	6%	11	14%	34	44%	25	32%	77	100%
Amhara	25	3%	56	6%	294	34%	418	48%	83	9%	876	100%
Oromia	31	2%	66	5%	452	32%	703	50%	153	11%	1,405	100%
Somali	8	5%	13	8%	38	24%	67	42%	35	22%	161	100%
Benishangul-Gumuz	2	5%	2	5%	8	19%	29	67%	2	5%	43	100%
SNNP	24	3%	29	4%	191	25%	392	51%	137	18%	773	100%
Gambella	0	0%	1	4%	4	15%	13	48%	9	33%	27	100%
Harari	1	7%	1	7%	5	33%	6	40%	2	13%	15	100%
Addis Ababa	11	7%	33	22%	57	38%	43	28%	7	5%	151	100%
Dire Dawa	3	14%	0	0%	3	14%	12	57%	3	14%	21	100%
Facility type												
Hospitals/MCH specialty centres	112	35%	108	34%	48	15%	36	11%	12	4%	316	100%
Health centres/clinics[1]	4	0%	123	4%	1,127	32%	1,772	51%	462	13%	3,488	100%
Managing authority												
Public/government	106	3%	198	5%	1,142	31%	1,760	48%	456	12%	3,662	100%
Private-for-profit	5	6%	23	28%	22	27%	21	25%	12	14%	83	100%
Private-not-for-profit[2]	5	8%	10	17%	11	19%	27	46%	6	10%	59	100%
Location												
Urban	110	7%	167	11%	485	32%	597	40%	138	9%	1,497	100%
Rural	6	0%	64	3%	690	30%	1,211	52%	336	15%	2,307	100%

SF = signal function.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 4.2.1A: Percent of facilities that are ready to provide and currently provide each EmONC signal function, by facility type, Ethiopia EmONC, 2016

	National				Hospitals/MCH specialty centres				Health centres/clinics[1]			
	Facility had required:		Facility was ready to provide (supplied and staffed)[2]	Facility provided SF in last 3 months	Facility had required:		Facility was ready to provide (supplied and staffed)[2]	Facility provided SF in last 3 months	Facility had required:		Facility was ready to provide (supplied and staffed)[2]	Facility provided SF in last 3 months
	Drugs, equipment, and supplies	Human resources			Drugs, equipment, and supplies	Human resources			Drugs, equipment, and supplies	Human resources		
EmONC signal functions												
Parenteral antibiotics	63%	99%	63%	80%	78%	100%	78%	96%	62%	99%	61%	79%
Parenteral uterotonics	91%	99%	91%	93%	96%	100%	96%	95%	91%	99%	91%	93%
Parenteral anticonvulsants	77%	88%	72%	26%	96%	99%	95%	80%	76%	87%	70%	22%
Manual removal of placenta	98%	97%	95%	62%	99%	98%	98%	81%	97%	97%	95%	60%
Removal of retained products	48%	58%	38%	42%	93%	96%	90%	76%	43%	54%	34%	39%
Assisted vaginal delivery	62%	58%	49%	35%	98%	97%	95%	85%	59%	54%	44%	30%
Newborn resuscitation with bag and mask	71%	98%	70%	73%	87%	99%	86%	90%	69%	98%	69%	71%
Caesarean delivery	6%	8%	6%	7%	73%	83%	69%	80%	0%	1%	0%	1%
Blood transfusion	4%	8%	4%	6%	46%	79%	45%	65%	0%	1%	0%	0%

SF = signal function.

[1] Includes MCH specialty clinics and higher clinics.

[2] There are 2 components to being "ready" to provide a signal function: the availability of a minimum package of drugs, equipment, and supplies, and the availability of at least one cadre who provides the signal function.

Table 4.2.2A: Percent of facilities that are ready to provide and currently provide each EmNeC signal function, by facility type, Ethiopia EmONC, 2016

	National				Hospitals/MCH specialty centres				Health centres/clinics[1]			
	Facility had required:		Facility was ready to provide (supplied and staffed)[2]	Facility provided SF in last 3 months	Facility had required:		Facility was ready to provide (supplied and staffed)[2]	Facility provided SF in last 3 months	Facility had required:		Facility was ready to provide (supplied and staffed)[2]	Facility provided SF in last 3 months
	Drugs, equipment, and supplies	Human resources			Drugs, equipment, and supplies	Human resources			Drugs, equipment, and supplies	Human resources		
EmNeC signal functions												
Newborn resuscitation with bag and mask	71%	98%	70%	73%	87%	99%	86%	90%	69%	98%	69%	71%
Antenatal corticosteroids	50%	35%	22%	9%	91%	87%	77%	59%	46%	31%	17%	5%
Antibiotics for pPROM	81%	82%	68%	43%	92%	98%	89%	84%	80%	81%	66%	39%
Antibiotics for neonatal sepsis	60%	88%	54%	33%	81%	97%	79%	71%	58%	88%	52%	30%
KMC for small babies	47%	92%	45%	49%	62%	94%	58%	65%	45%	91%	43%	47%
Safe administration of oxygen	39%	24%	16%	12%	96%	95%	90%	81%	34%	17%	9%	6%
IV fluids	71%	38%	29%	11%	90%	91%	79%	63%	69%	33%	24%	7%

KMC = kangaroo mother care; pPROM = preterm premature rupture of membranes, SF = signal function.

[1] Includes MCH specialty clinics and higher clinics.

[2] There are 2 components to being "ready" to provide a signal function: the availability of a minimum package of drugs, equipment, and supplies, and the availability of at least one cadre who provides the signal function.

Table 4.4.1A: Percent of hospitals/MCH specialty centres with a health worker who performed the EmONC and EmNeC signal functions in the last 3 months, by health worker cadre, Ethiopia EmONC, 2016

	Facilities that performed the SF in the last 3 months		Among facilities that performed the SF in the last 3 months, what health worker provided the SF?[1,2] (multiple responses allowed)											
	n	%	MD (general practitioner)	Obstetrician/ gynaecologist	Paediatrician	Neo-natologist	General surgeon	Health officer	Emergency surgical officer	Anaesthes-iologist/ anaesthetist	Midwife	Nurse	Lab technician	Other
EmONC signal functions[3]														
Parenteral anticonvulsants	252	80%	14%	17%				4%	37%	0%	89%	18%		0%
Manual removal of placenta	257	81%	12%	28%				4%	44%	0%	85%	9%		0%
Removal of retained products	241	76%	15%	27%				5%	49%	0%	74%	11%		0%
Assisted vaginal delivery	268	85%	11%	34%				4%	58%		71%	6%		0%
Caesarean delivery	253	80%	6%	50%			10%	2%	63%					1%
Blood transfusion	204	65%	15%	20%				5%	31%		80%	32%	8%	2%
EmNeC signal functions														
Newborn resuscitation with bag and mask	283	90%	11%	14%	13%	1%		6%	25%	18%	96%	28%		0%
Antenatal corticosteroids	187	59%	14%	24%	4%	0%		4%	33%		85%	20%		0%
Antibiotics for pPROM	267	84%	11%	18%	3%	0%		6%	30%		90%	19%		0%
Antibiotics for neonatal sepsis	224	71%	31%	9%	16%	2%		11%	21%		51%	60%		0%
KMC for small babies	206	65%	10%	8%	5%	0%		4%	14%		81%	46%		0%
Safe administration of oxygen	255	81%	21%	12%	12%	1%		6%	24%	19%	78%	49%		0%
IV fluids	199	63%	30%	8%	13%	2%		7%	15%	6%	45%	65%		0%

KMC = kangaroo mother care; pPROM = preterm premature rupture of membranes, SF = signal function.

[1] Data in this table was collected to cross-reference with other modules.

[2] Shaded cells indicate that the health worker cadre was not a response option (not expected to perform).

[3] Health worker cadre data was only collected for certain EmONC signal functions.

Table 4.4.2A: Percent of health centres/clinics[1] with a health worker who performed the EmONC and EmNeC signal functions in the last 3 months, by health worker cadre, Ethiopia EmONC, 2016

	Facilities that performed the SF in the last 3 months		Among facilities that performed the SF in the last 3 months, what health worker provided the SF?[2,3] (multiple responses allowed)											
	n	%	MD (general practitioner)	Obstetrician/ gynaecologist	Paediatrician	Neo-natologist	General surgeon	Health officer	Emergency surgical officer	Anaesthes-iologist/ anaesthetist	Midwife	Nurse	Lab technician	Other
EmONC signal functions[4]														
Parenteral anticonvulsants	750	22%	1%	1%				35%	1%	0%	84%	21%		0%
Manual removal of placenta	2,087	60%	0%	1%				27%	1%	0%	89%	24%		0%
Removal of retained products	1,365	39%	1%	1%				26%	0%	0%	89%	20%		0%
Assisted vaginal delivery	1,053	30%	1%	2%				27%	1%		92%	17%		0%
Caesarean delivery[5]	20	1%	0%	50%			0%	35%	25%					0%
Blood transfusion[5]	14	0%	21%	43%				21%	14%		64%	50%	0%	0%
EmNeC signal functions														
Newborn resuscitation with bag and mask	2,481	71%	0%	1%	0%	0%		25%	0%	0%	93%	30%		0%
Antenatal corticosteroids	169	5%	4%	3%	1%	0%		42%	2%		80%	26%		0%
Antibiotics for pPROM	1,363	39%	1%	0%	0%	0%		32%	1%		87%	20%		0%
Antibiotics for neonatal sepsis	1,049	30%	1%	1%	0%	0%		49%	0%		58%	46%		0%
KMC for small babies	1,646	47%	0%	0%	0%	0%		19%	0%		94%	27%		0%
Safe administration of oxygen[5]	195	6%	2%	2%	0%	0%		27%	1%	3%	93%	36%		0%
IV fluids	237	7%	2%	1%	0%	0%		50%	1%	3%	81%	56%		0%

KMC = kangaroo mother care; pPROM = preterm premature rupture of membranes.

[1] Includes MCH specialty clinics and higher clinics.

[2] Data in this table were collected to cross-reference with other modules.

[3] Shaded cells indicate that the health worker cadre was not a response option (not expected to perform).

[4] Health worker cadre data were only collected for certain EmONC signal functions.

[5] Health centres/clinics are not expected to perform these signal functions, with a few exceptions.

Table 4.5.1A: Percent distribution of institutional deliveries according to mode of delivery, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of deliveries	Mode of delivery					
		Spontaneous vaginal	Instrumental vaginal	Caesarean	Destructive[1]	Laparotomy[2]	Total
National	1,924,330	94%	2%	4%	0%	0%	100%
Region							
Tigray	113,425	92%	3%	5%	0%	0%	100%
Afar	7,678	93%	3%	3%	0%	0%	100%
Amhara	386,131	95%	2%	3%	0%	0%	100%
Oromia	844,287	96%	1%	2%	0%	0%	100%
Somali	22,036	95%	2%	2%	0%	0%	100%
Benishangul-Gumuz	12,288	91%	3%	6%	0%	0%	100%
SNNP	417,697	95%	1%	3%	0%	0%	100%
Gambella	3,383	91%	5%	4%	0%	0%	100%
Harari	7,579	77%	5%	17%	0%	0%	100%
Addis Ababa	101,401	69%	5%	26%	0%	0%	100%
Dire Dawa	8,425	80%	3%	17%	0%	0%	100%
Facility type							
Referral/specialized hospitals	103,331	62%	8%	29%	0%	1%	100%
General hospitals	127,099	70%	7%	22%	0%	0%	100%
Primary hospitals	104,624	84%	6%	9%	0%	0%	100%
MCH specialty centres	17,628	49%	5%	46%	0%	0%	100%
Health centres	1,565,273	99%	1%	0%	0%	0%	100%
MCH specialty clinics	3,304	65%	7%	28%	0%	0%	100%
Higher clinics	3,071	93%	6%	1%	0%	0%	100%
Managing authority							
Public/government	1,861,793	95%	2%	3%	0%	0%	100%
Private-for-profit	28,489	47%	4%	49%	0%	0%	100%
Private-not-for-profit[3]	34,048	75%	6%	19%	0%	0%	100%
Location							
Urban	971,504	89%	3%	8%	0%	0%	100%
Rural	952,826	99%	0%	0%	0%	0%	100%

[1] Destructive delivery includes craniotomies and embryotomies.

[2] Laparotomy for ruptured uterus.

[3] Includes NGO, faith-based, or mission facilities.

Table 4.5.2A: Institutional caesarean delivery rate in all facilities and facilities that provide caesarean sections, by region, managing authority, and location, Ethiopia EmONC, 2016

	All facilities			All facilities that provide CS[1]		
	Number of deliveries	Number of deliveries by CS	Institutional CS rate	Number of deliveries	Number of deliveries by CS	Institutional CS rate
National	1,924,330	78,916	4%	338,057	75,128	22%
Region						
Tigray	113,425	5,404	5%	38,098	5,175	14%
Afar	7,678	229	3%	2,189	225	10%
Amhara	386,131	10,963	3%	49,108	10,961	22%
Oromia	844,287	19,240	2%	98,100	18,224	19%
Somali	22,036	527	2%	8,901	519	6%
Benishangul-Gumuz	12,288	700	6%	3,314	700	21%
SNNP	417,697	12,863	3%	69,545	12,757	18%
Gambella	3,383	135	4%	1,729	135	8%
Harari	7,579	1,296	17%	5,399	1,296	24%
Addis Ababa	101,401	26,138	26%	56,167	23,715	42%
Dire Dawa	8,425	1,421	17%	5,507	1,421	26%
Managing authority						
Public/government	1,861,793	58,667	3%	290,150	54,983	19%
Private-for-profit	28,489	13,914	49%	25,384	13,810	54%
Private-not-for-profit[2]	34,048	6,335	19%	22,523	6,335	28%
Location						
Urban	971,504	75,730	8%	318,232	71,942	23%
Rural	952,826	3,186	0%	19,825	3,186	16%

CS = caesarean section.

[1] Facilities that provide CS, irrespective of their EmONC status.

[2] Includes NGO, faith-based, or mission facilities.

Table 4.6.1A: Percent of women with major direct obstetric complications among those delivered in all facilities and EmONC facilities, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

		All facilities		EmONC facilities	
	Number of deliveries	Number of women with major DOCs[1]	Percent of women with major DOCs[1]	Number of women with major DOCs[1]	Percent of women with major DOCs[1]
National	1,924,330	78,852	4%	38,196	2%
Region					
Tigray	113,425	8,012	7%	4,085	4%
Afar	7,678	611	8%	396	5%
Amhara	386,131	18,406	5%	7,675	2%
Oromia	844,287	22,667	3%	11,532	1%
Somali	22,036	1,726	8%	1,298	6%
Benishangul-Gumuz	12,288	1,229	10%	1,008	8%
SNNP	417,697	11,087	3%	6,000	1%
Gambella	3,383	64	2%	57	2%
Harari	7,579	767	10%	704	9%
Addis Ababa	101,401	13,244	13%	4,829	5%
Dire Dawa	8,425	1,039	12%	612	7%
Facility type					
Hospitals/MCH specialty centres	352,682	41,258	12%	32,995	9%
Health centres/clinics[2]	1,571,648	37,594	2%	5,201	0%
Managing authority					
Public/government	1,861,793	74,285	4%	36,216	2%
Private-for-profit	28,489	2,423	9%	772	3%
Private-not-for-profit[3]	34,048	2,144	6%	1,208	4%
Location					
Urban	971,504	63,400	7%	36,261	4%
Rural	952,826	15,452	2%	1,935	0%

DOC = direct obstetric complication.

[1] Major DOCs include: ruptured uterus, postpartum sepsis, severe pre-eclampsia/eclampsia, severe complications of abortion, antepartum haemorrhage, obstructed/prolonged labour, postpartum haemorrhage/retained placenta, and ectopic pregnancy (excludes "other" DOCs).

[2] Includes MCH specialty clinics and higher clinics.

[3] Includes NGO, faith-based, or mission facilities.

Table 4.8.1A: Cause-specific direct obstetric case fatality rates in all facilities and percent distribution of maternal deaths due to direct obstetric complications, by cause, Ethiopia EmONC, 2016

	Number of women with direct complications	Number of maternal deaths	Cause-specific DOCFR	Percent distribution of maternal deaths due to direct complications
Direct causes				
Ruptured uterus	1,604	41	2.6%	7%
Postpartum sepsis	1,820	21	1.2%	4%
Severe PE/E	11,924	137	1.1%	24%
Severe complications of abortion	3,793	9	0.2%	2%
APH	7,897	30	0.4%	5%
Obstructed/prolonged labour	36,394	47	0.1%	8%
PPH/retained placenta	13,440	127	0.9%	23%
Ectopic pregnancy	1,980	0	0.0%	0%
Other direct complications/causes[1]	52,096	152	0.3%	27%
Total direct causes	130,948	564	0.4%	100%

APH = antepartum haemorrhage; DOCFR = direct obstetric case fatality rate; PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

[1] Other direct complications/causes do not include post-abortion care cases (n=50,231 see table 4.8.1).

Table 4.9.2A: Percent of post-abortion and postpartum cases discharged with family planning method, by region, Ethiopia EmONC, 2016

	Post-abortion cases	Post-abortion women discharged with FP method		Deliveries	Postpartum women discharged with FP method	
	n	n	%	n	n	%
National	134,871	89,590	66%	1,924,330	8,845	0.5%
Region						
Tigray	16,108	11,455	71%	113,425	153	0.1%
Afar	568	347	61%	7,678	157	2.0%
Amhara	25,537	18,745	73%	386,131	4,064	1.1%
Oromia	52,305	36,246	69%	844,287	1,577	0.2%
Somali	863	141	16%	22,036	171	0.8%
Benishangul-Gumuz	856	418	49%	12,288	0	0.0%
SNNP	19,364	12,633	65%	417,697	784	0.2%
Gambella	294	6	2%	3,383	0	0.0%
Harari	1,410	1,274	90%	7,579	50	0.7%
Addis Ababa	15,819	7,213	46%	101,401	1,832	1.8%
Dire Dawa	1,747	1,112	64%	8,425	57	0.7%

FP = family planning.

Table 5.1.2A: Percent of hospitals and MCH specialty centres that provide obstetric surgery, anaesthesia for major surgery, IV fluids for newborns, administration of oxygen to newborns, fistula repair, and cervical screening, by region, managing authority, and location, Ethiopia EmONC, 2016

	Number of hospitals/ MCH specialty centres	Obstetric surgery	Anaesthesia for major surgery	IV fluids to newborns	Administration of oxygen to newborn	Simple fistula repair	Cervical screening
National	316	80%	49%	63%	81%	12%	61%
Region							
Tigray	40	78%	23%	45%	85%	18%	60%
Afar	7	86%	0%	71%	57%	14%	71%
Amhara	58	78%	50%	71%	79%	12%	50%
Oromia	77	86%	60%	68%	87%	8%	51%
Somali	10	70%	40%	80%	80%	30%	30%
Benishangul-Gumuz	3	67%	67%	67%	67%	0%	67%
SNNP	60	70%	42%	70%	73%	13%	65%
Gambella	1	100%	100%	100%	100%	0%	100%
Harari	7	86%	57%	14%	57%	0%	57%
Addis Ababa	47	89%	77%	55%	87%	11%	89%
Dire Dawa	6	83%	0%	50%	67%	17%	67%
Managing authority							
Public/government	236	80%	47%	72%	84%	14%	54%
Private-for-profit	61	85%	62%	33%	72%	3%	84%
Private-not-for-profit[1]	19	68%	32%	47%	63%	21%	68%
Location							
Urban	293	81%	51%	63%	81%	12%	62%
Rural	23	70%	30%	57%	83%	13%	39%

[1] Includes NGO, faith-based, or mission facilities.

Table 5.3.2A: Percent of facilities that charge women separately for specific items and have waiver systems for the poor, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Women are charged separately for:				Waiver system for maternity services	
		Bed	Food for mother	Blood transfusion	Formula milk	Formal	Informal
National	3,804	4%	3%	1%	2%	45%	17%
Region							
Tigray	255	3%	0%	0%	3%	34%	40%
Afar	77	1%	1%	0%	1%	13%	10%
Amhara	876	2%	3%	0%	1%	48%	14%
Oromia	1,405	3%	3%	0%	1%	37%	15%
Somali	161	5%	1%	1%	0%	64%	19%
Benishangul-Gumuz	43	0%	2%	0%	2%	70%	46%
SNNP	773	2%	2%	0%	2%	59%	11%
Gambella	27	0%	0%	0%	0%	22%	5%
Harari	15	13%	7%	13%	0%	73%	50%
Addis Ababa	151	34%	8%	13%	15%	41%	26%
Dire Dawa	21	19%	5%	0%	5%	67%	43%
Facility type							
Referral/specialized hospitals	30	10%	3%	3%	7%	60%	50%
General hospitals	103	33%	16%	11%	12%	38%	30%
Primary hospitals	160	9%	3%	4%	5%	48%	14%
MCH specialty centres	23	70%	4%	35%	52%	26%	53%
Health centres	3,459	2%	2%	0%	1%	45%	16%
MCH specialty clinics	16	56%	0%	0%	6%	25%	50%
Higher clinics	13	62%	8%	8%	8%	31%	67%
Managing authority							
Public/government	3,662	2%	2%	0%	1%	46%	16%
Private-for-profit	83	81%	17%	26%	33%	23%	42%
Private-not-for-profit[1]	59	19%	5%	2%	2%	37%	30%
Location							
Urban	1,497	7%	3%	2%	3%	41%	18%
Rural	2,307	2%	3%	0%	1%	48%	16%

[1] Includes NGO, faith-based, or mission facilities.

Table 5.3.3A: Mean cost in Birr to clients for selected services, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Among facilities that offer the service or item and charge, the mean cost to the client (Birr)[1] is:								
	Card fee	Assisted vaginal delivery	Caesarean delivery	Neonatal special care unit (per day)	IV fluids	Prescription of oxytocin (inj.)	Prescription of magnesium sulphate (inj.)	Safe abortion	Post-abortion care
National	40	2,024	4,750	975	37	43	30	598	441
Region									
Tigray	37	[2,600]	[6,667]	[1,000]	32	[35]	[70]	[950]	[494]
Afar					[23]		[3]		
Amhara	33	1,471	[3,844]	[66]	36	[95]	[77]	527	531
Oromia	13	1,162	3,564	175	34	31	[14]	381	204
Somali	16	[1,012]	[5,000]	[20]	46	[28]	[72]	[300]	[137]
B-Gumuz					35	[8]	[3]	[30]	
SNNP	14	[158]	[114]	[57]	35	[53]	11	130	173
Gambella	3				[22]				[23]
Harari	35	[950]	[6400]	[350]	[44]	[30]		[1160]	[1,000]
Addis Ababa	101	3,226	6,255	[4,740]	51	44	78	1,062	1,053
Dire Dawa	69	[1,900]	[6,833]		[52]	[15]		[700]	[700]
Facility type									
Referral/specialized hospitals	6	[40]	[114]	[88]	[35]	[400]	[100]	[143]	[182]
General hospitals	87	2,420	5,549	[2,131]	54	47	66	861	823
Primary hospitals	37	1,818	4,677	97	41	[57]	[29]	334	490
MCH specialty centres	94	2,847	6,962	[4,833]	48	41	[85]	948	764
Health centres	7	354	157	[267]	32	28	6	78	65
MCH specialty clinics	70	2,169	[6,000]	[500]	56	[26]	[35]	789	847
Higher clinics	42	[1,575]	[6,000]		59	[20]	[87]	[450]	[433]
Managing authority									
Public/government	10	663	1,650	263	33	42	6	157	102
Private-for-profit	85	2,566	6,240	3,005	57	46	81	956	928
Private-not-for-profit[2]	26	1,098	2,206	[377]	35	37	[37]	347	305
Location									
Urban	58	2,075	5,039	1,028	44	45	58	620	590
Rural	7	[570]	[744]	[345]	32	[16]	4	[205]	72

[1] Mean cost calculated for those facilities that charge. Shaded cells indicate that facilities did not offer the service, did not charge, or did not know. Means in brackets indicate they were based on fewer than 10 facilities.

[2] Includes NGO, faith-based, or mission facilities.

Table 5.3.5A: Percent of facilities with different policies related to maternal and newborn service delivery, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Frequent staff rotation for:		Woman can choose a companion of her choice during:		Woman can walk around during labour	Woman can choose position during labour/delivery	Certified by mother-baby friendly birthing facility initiative	Family can register the birth of their baby on-site (Civil Registration System)
		Maternal care	Newborn care	Labour	Delivery				
National	3,804	33%	34%	91%	76%	97%	63%	17%	24%
Region									
Tigray	255	49%	47%	97%	92%	99%	95%	14%	35%
Afar	77	30%	31%	92%	71%	92%	55%	3%	6%
Amhara	876	25%	25%	93%	83%	97%	72%	12%	24%
Oromia	1,405	27%	26%	92%	70%	97%	61%	19%	27%
Somali	161	58%	54%	80%	73%	88%	54%	12%	27%
Benishangul-Gumuz	43	79%	77%	93%	81%	100%	56%	26%	21%
SNNP	773	41%	47%	90%	76%	97%	52%	19%	9%
Gambella	27	30%	19%	63%	59%	100%	52%	7%	7%
Harari	15	13%	13%	87%	67%	93%	53%	0%	93%
Addis Ababa	151	43%	43%	85%	70%	98%	71%	33%	53%
Dire Dawa	21	0%	0%	95%	90%	95%	10%	0%	90%
Facility type									
Referral/specialized hospitals	30	60%	60%	73%	63%	97%	67%	40%	43%
General hospitals	103	51%	49%	86%	77%	97%	64%	34%	49%
Primary hospitals	160	48%	51%	88%	65%	97%	64%	19%	36%
MCH specialty centres	23	57%	57%	83%	61%	96%	61%	26%	48%
Health centres	3,459	32%	32%	91%	77%	97%	63%	16%	23%
MCH specialty clinics	16	44%	31%	100%	81%	88%	81%	44%	25%
Higher clinics	13	38%	38%	92%	62%	92%	46%	8%	23%
Managing authority									
Public/government	3,662	33%	34%	91%	76%	97%	64%	16%	24%
Private-for-profit	83	36%	34%	77%	59%	92%	53%	28%	54%
Private-not-for-profit[1]	59	47%	51%	90%	76%	95%	51%	32%	25%
Location									
Urban	1,497	37%	36%	91%	74%	97%	66%	22%	27%
Rural	2,307	31%	32%	91%	77%	97%	62%	14%	22%

[1] Includes NGO, faith-based, or mission facilities.

Table 6.2.1A: Average number of beds per facility and ratio of maternity beds to 1,000 deliveries,[1] by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Number of beds (in all departments)	Average number of beds per facility	Number of annual institutional deliveries[2]	Number of ob/gyn beds[3]	Number of labour beds/ couches[4]	Number of delivery beds/ couches[5]	Ratio of ob/gyn beds[3] to 1,000 deliveries	Ratio of labour beds/ couches[4] to 1,000 deliveries	Ratio of delivery beds/ couches[5] to 1,000 deliveries	Ratio of ob/gyn[3] + labour[4] + delivery[5] beds/couches to 1,000 deliveries
National	3,804	57,706	15	1,924,330	21,186	6,285	8,400	11	3	4	19
Region											
Tigray	255	4,891	19	113,425	1,753	503	598	15	4	5	25
Afar	77	910	12	7,678	240	101	154	31	13	20	64
Amhara	876	10,293	12	386,131	4,100	1,151	1,837	11	3	5	18
Oromia	1,405	19,468	14	844,287	7,671	2,207	2,960	9	3	4	15
Somali	161	2,600	16	22,036	829	280	331	38	13	15	65
B-Gumuz	43	637	15	12,288	227	75	110	18	6	9	34
SNNP	773	11,033	14	417,697	4,310	1,394	1,897	10	3	5	18
Gambella	27	316	12	3,383	75	26	21	22	8	6	36
Harari	15	720	48	7,579	122	77	46	16	10	6	32
Addis Ababa	151	6,267	42	101,401	1,702	408	392	17	4	4	25
Dire Dawa	21	571	27	8,425	157	63	54	19	7	6	33
Facility type											
Referral/specialized hospitals	30	8,203	273	103,331	1,363	242	174	13	2	2	17
General hospitals	103	9,899	96	127,099	2,167	633	560	17	5	4	26
Primary hospitals	160	7,960	50	104,624	2,220	705	662	21	7	6	34
MCH specialty centres	23	475	21	17,628	325	86	70	18	5	4	27
Health centres	3,459	30,873	9	1,565,273	14,934	4,573	6,873	10	3	4	17
MCH specialty clinics	16	160	10	3,304	115	25	35	35	8	11	53
Higher clinics	13	136	10	3,071	62	21	26	20	7	8	35
Managing authority											
Public/government	3,662	52,584	14	1,861,793	19,829	5,620	7,795	11	3	4	18
Private-for-profit	83	3,197	39	28,489	845	454	398	30	16	14	60
Private-not-for-profit[6]	59	1,925	33	34,048	512	211	207	15	6	6	27
Location											
Urban	1,497	38,217	26	971,504	11,929	3,516	4,091	12	4	4	20
Rural	2,307	19,489	8	952,826	9,257	2,769	4,309	10	3	5	17

[1] According to the *Essential elements of obstetric care at first referral level* (WHO, 1991) there should be 24 beds per 1,000 deliveries in the maternity ward (for both prenatal and postnatal clients). The labour and delivery room should have 6-8 beds. Overall, therefore, the standard would be approximately 30-32 beds per 1,000 deliveries at a facility that would be considered 'first referral level.' This is the equivalent to a district level hospital for about 100,000 population.

[2] Deliveries from the period of January through December 2015.

[3] For antenatal, postpartum, post-operative, post-abortion (etc.) clients.

[4] For clients in the 1st stage of labour.

[5] For clients in the 2nd stage of labour.

[6] Includes NGO, faith-based, or mission facilities.

Table 6.3.1A: Percent of facilities with separate room or space for selected maternal and newborn services, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Antenatal room	Labour and delivery together	1st stage labour room	Delivery room	Maternity room for complic-ations	Postnatal room	Post caesarean room	General operating theatre	Ob/gyn operating theatre	ICU	Newborn corner	NICU	Paediatrics ward	IMNCI clinic	Laboratory and mini blood bank together	Separate laboratory room	Separate mini blood bank room
National	3,804	80%	65%	47%	71%	10%	68%	7%	7%	4%	3%	27%	5%	15%	59%	5%	84%	3%
Region																		
Tigray	255	96%	99%	68%	96%	15%	82%	15%	13%	9%	6%	67%	7%	18%	82%	8%	85%	4%
Afar	77	81%	86%	45%	87%	8%	48%	8%	9%	8%	3%	5%	4%	10%	73%	1%	81%	0%
Amhara	876	78%	69%	37%	71%	8%	57%	6%	6%	3%	3%	28%	5%	21%	62%	4%	80%	4%
Oromia	1,405	82%	56%	49%	66%	8%	78%	4%	5%	2%	2%	17%	4%	9%	62%	4%	83%	1%
Somali	161	89%	82%	49%	76%	14%	60%	5%	6%	2%	2%	12%	3%	12%	29%	6%	81%	1%
Benishangul-Gumuz	43	86%	93%	63%	77%	28%	53%	7%	5%	5%	2%	16%	5%	42%	70%	2%	98%	0%
SNNP	773	68%	57%	40%	65%	9%	57%	6%	6%	4%	3%	34%	6%	16%	49%	3%	86%	2%
Gambella	27	33%	100%	11%	37%	4%	22%	0%	4%	0%	0%	15%	0%	11%	7%	0%	89%	0%
Harari	15	100%	53%	53%	47%	13%	73%	40%	27%	20%	13%	20%	7%	13%	20%	13%	87%	0%
Addis Ababa	151	95%	65%	85%	91%	34%	91%	29%	25%	22%	19%	51%	17%	31%	69%	25%	95%	18%
Dire Dawa	21	95%	24%	81%	81%	0%	52%	24%	24%	14%	10%	10%	10%	14%	10%	19%	81%	0%
Facility type																		
Referral/specialized hospitals	30	100%	67%	93%	93%	80%	93%	93%	97%	73%	73%	80%	87%	97%	70%	83%	87%	43%
General hospitals	103	94%	65%	88%	92%	68%	92%	83%	94%	54%	53%	70%	63%	83%	62%	58%	88%	33%
Primary hospitals	160	93%	59%	89%	96%	54%	91%	68%	79%	38%	23%	59%	45%	80%	71%	31%	89%	25%
MCH specialty centres	23	87%	61%	91%	96%	39%	87%	65%	26%	57%	26%	61%	26%	43%	43%	48%	78%	39%
Health centres	3,459	78%	65%	43%	69%	5%	65%	1%	0%	0%	0%	24%	1%	9%	59%	1%	83%	0%
MCH specialty clinics	16	81%	50%	81%	94%	25%	63%	13%	6%	6%	0%	25%	0%	6%	6%	19%	88%	6%
Higher clinics	13	77%	85%	69%	92%	38%	69%	15%	8%	8%	0%	38%	0%	15%	15%	0%	100%	8%
Managing authority																		
Public/government	3,662	79%	65%	46%	70%	9%	67%	5%	6%	3%	3%	26%	5%	14%	60%	4%	83%	2%
Private-for-profit	83	87%	67%	84%	92%	49%	80%	65%	59%	41%	29%	49%	23%	51%	37%	47%	86%	33%
Private-not-for-profit[1]	59	90%	63%	71%	86%	25%	80%	22%	22%	17%	10%	53%	12%	34%	49%	10%	98%	8%
Location																		
Urban	1,497	86%	63%	60%	79%	18%	76%	16%	17%	10%	8%	38%	12%	26%	63%	11%	93%	7%
Rural	2,307	75%	66%	39%	66%	5%	62%	1%	1%	1%	0%	20%	1%	8%	56%	1%	78%	0%

ICU = intensive care unit; IMNCI = integrated management of neonatal and childhood illness; NICU = neonatal intensive care unit.

[1] Includes NGO, faith-based, or mission facilities.

Table 6.4.2A: Percent of facilities with any source of electricity, and among those, percent distribution according to interruptions in the 7 days prior to the survey, by region, facility type and managing authority, Ethiopia EmONC, 2016

	Number of facilities	Has a source of electricity	Among facilities with any source of electricity, duration of interruptions in 7 days prior to day of survey				
			No interruption (continuous electricity)	Interruption ≤2 hours at a time	Interruption >2 hours at a time	No electricity in 7 days prior to survey	Total
National	3,804	88%	18%	8%	65%	9%	100%
Region							
Tigray	255	96%	22%	11%	65%	3%	100%
Afar	77	88%	7%	4%	60%	28%	100%
Amhara	876	88%	17%	6%	69%	8%	100%
Oromia	1,405	87%	12%	10%	67%	10%	100%
Somali	161	84%	23%	2%	57%	18%	100%
Benishangul-Gumuz	43	98%	36%	12%	50%	2%	100%
SNNP	773	87%	24%	6%	63%	8%	100%
Gambella	27	93%	4%	4%	76%	16%	100%
Harari	15	100%	40%	7%	47%	7%	100%
Addis Ababa	151	100%	36%	9%	54%	1%	100%
Dire Dawa	21	100%	29%	5%	67%	0%	100%
Facility type							
Referral/specialized hospitals	30	100%	57%	13%	30%	0%	100%
General hospitals	103	99%	34%	14%	49%	3%	100%
Primary hospitals	160	99%	28%	8%	62%	2%	100%
MCH specialty centres	23	100%	39%	9%	48%	4%	100%
Health centres	3,459	87%	17%	8%	67%	9%	100%
MCH specialty clinics	16	100%	31%	31%	38%	0%	100%
Higher clinics	13	100%	38%	15%	46%	0%	100%
Managing authority							
Public/government	3,662	88%	18%	8%	66%	9%	100%
Private-for-profit	83	98%	28%	16%	52%	4%	100%
Private-not-for-profit[1]	59	95%	38%	14%	46%	2%	100%
Location							
Urban	1,497	97%	20%	9%	68%	3%	100%
Rural	2,307	83%	17%	7%	63%	13%	100%

[1] Includes NGO, faith-based, or mission facilities.

Table 6.4.3A: Percent of facilities with functioning electricity in selected maternal health service areas of the facility, among those facilities with a separate room for the service[1], by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Antenatal room	Labour and delivery room	1st stage of labour room	Delivery room	Maternity room for complications	Postnatal room	Post caesarean room	General operating theatre	Ob/gyn operating theatre	Laboratory and mini blood bank room	Separate laboratory room	Separate mini blood bank room
National	70%	74%	79%	77%	85%	75%	95%	97%	96%	96%	78%	93%
Region												
Tigray	91%	93%	94%	95%	97%	94%	100%	100%	95%	100%	95%	91%
Afar	58%	62%	54%	60%	67%	70%	100%	100%	100%	100%	68%	
Amhara	73%	74%	80%	79%	83%	77%	90%	96%	97%	97%	80%	91%
Oromia	63%	66%	73%	71%	75%	68%	95%	97%	97%	94%	74%	87%
Somali	57%	66%	61%	66%	77%	68%	88%	80%	75%	78%	68%	50%
Benishangul-Gumuz	78%	83%	78%	85%	75%	78%	100%	100%	100%	100%	86%	
SNNP	71%	77%	81%	78%	89%	77%	92%	94%	93%	100%	77%	100%
Gambella	56%	37%	67%	50%	100%	83%		100%			42%	
Harari	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Addis Ababa	98%	98%	98%	99%	100%	97%	100%	100%	100%	97%	99%	100%
Dire Dawa	80%	80%	82%	82%		91%	100%	100%	100%	100%	76%	
Facility type												
Referral/specialized hospitals	100%	100%	100%	100%	100%	100%	96%	100%	100%	100%	100%	100%
General hospitals	98%	99%	99%	99%	99%	99%	99%	99%	98%	98%	99%	100%
Primary hospitals	94%	97%	96%	97%	95%	97%	96%	95%	92%	100%	99%	93%
MCH specialty centres	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Health centres	67%	72%	75%	75%	72%	72%	72%	82%	100%	83%	76%	43%
MCH specialty clinics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Higher clinics	100%	100%	100%	100%	100%	100%	100%	100%	100%		100%	100%
Managing authority												
Public/government	69%	73%	78%	76%	82%	74%	93%	96%	95%	96%	77%	90%
Private-for-profit	100%	98%	100%	100%	100%	100%	100%	98%	100%	97%	100%	100%
Private-not-for-profit[2]	92%	97%	100%	98%	100%	96%	100%	100%	100%	100%	93%	100%
Location												
Urban	88%	90%	92%	90%	94%	90%	95%	97%	96%	99%	92%	96%
Rural	57%	64%	66%	67%	62%	64%	95%	89%	100%	80%	68%	57%

[1] Shaded cells indicate that no facilities reported having the specified area. For example, no facilities in Dire Dawa reported having a maternity room for complications.

[2] Includes NGO, faith-based, or mission facilities.

Table 6.4.4A: Percent of facilities with functioning electricity in ICUs and newborn areas of the facility, among those facilities with a separate room for the service,[1] by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	ICU	Newborn corner	NICU	Paediatrics ward	IMNCI clinic
National	97%	84%	98%	85%	71%
Region					
Tigray	100%	95%	100%	96%	91%
Afar	100%	100%	100%	88%	63%
Amhara	92%	82%	95%	77%	69%
Oromia	100%	76%	100%	91%	66%
Somali	67%	74%	80%	74%	50%
Benishangul-Gumuz	100%	71%	100%	72%	80%
SNNP	95%	85%	100%	83%	70%
Gambella		0%		100%	50%
Harari	100%	100%	100%	100%	100%
Addis Ababa	100%	100%	100%	100%	98%
Dire Dawa	100%	100%	100%	100%	50%
Facility type					
Referral/specialized hospitals	100%	100%	100%	100%	100%
General hospitals	98%	99%	98%	99%	98%
Primary hospitals	97%	99%	100%	95%	95%
MCH specialty centres	100%	100%	100%	100%	100%
Health centres	82%	81%	91%	75%	68%
MCH specialty clinics		100%		100%	100%
Higher clinics		100%		100%	100%
Managing authority					
Public/government	96%	83%	98%	83%	70%
Private-for-profit	100%	100%	100%	100%	100%
Private-not-for-profit[2]	100%	100%	100%	100%	97%
Location					
Urban	97%	91%	99%	93%	89%
Rural	100%	77%	89%	68%	58%

ICU = intensive care unit; IMNCI = integrated management of neonatal and childhood illness; NICU = neonatal intensive care unit.

[1] Shaded cells indicate that no facilities reported having the specified area. For example, no facilities in Gambella reported having either an ICU or a NICU.

[2] Includes NGO, faith-based, or mission facilities.

Table 6.4.5A: Percent distribution of facilities according to their primary source of water, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Piped water	Hand pump	Well	River	Rain Water	Other[1]	No water	Total
National	3,804	53%	10%	5%	6%	3%	1%	22%	100%
Region									
Tigray	255	56%	19%	1%	4%	1%	2%	18%	100%
Afar	77	45%	3%	0%	0%	0%	1%	51%	100%
Amhara	876	46%	15%	3%	6%	0%	1%	29%	100%
Oromia	1,405	54%	7%	4%	9%	6%	0%	20%	100%
Somali	161	35%	2%	18%	6%	14%	0%	24%	100%
Benishangul-Gumuz	43	51%	28%	5%	9%	2%	0%	5%	100%
SNNP	773	53%	9%	8%	5%	3%	1%	21%	100%
Gambella	27	19%	56%	0%	4%	0%	0%	22%	100%
Harari	15	87%	0%	0%	0%	0%	0%	13%	100%
Addis Ababa	151	99%	1%	1%	0%	0%	0%	0%	100%
Dire Dawa	21	81%	0%	0%	0%	0%	0%	19%	100%
Facility type									
Referral/specialized hospitals	30	93%	3%	3%	0%	0%	0%	0%	100%
General hospitals	103	90%	2%	2%	2%	0%	0%	4%	100%
Primary hospitals	160	90%	3%	1%	1%	0%	0%	5%	100%
MCH specialty centres	23	100%	0%	0%	0%	0%	0%	0%	100%
Health centres	3,459	49%	11%	5%	7%	4%	1%	24%	100%
MCH specialty clinics	16	94%	6%	0%	0%	0%	0%	0%	100%
Higher clinics	13	85%	0%	0%	0%	8%	0%	8%	100%
Managing authority									
Public/government	3,662	51%	10%	5%	7%	4%	1%	23%	100%
Private-for-profit	83	95%	0%	0%	0%	0%	0%	5%	100%
Private-not-for-profit[2]	59	88%	3%	3%	3%	0%	0%	2%	100%
Location									
Urban	1,497	79%	6%	3%	3%	2%	0%	8%	100%
Rural	2,307	36%	13%	6%	8%	5%	1%	31%	100%

[1] Other sources include spring water, pond, tanker, etc.

[2] Includes NGO, faith-based, or mission facilities.

Table 6.4.7A: Percent of facilities with a water source that have a tank to reserve water, capacity of tank, primary source to refill tank, and frequency of filling, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with a water source	Among facilities with a water source		Among facilities with a water tank, primary source of water						Among facilities with a water tank, frequency of filling					
		Has water tank	Average max volume of tank (litres)	Harvested rain	Truck/ vessel	Piped water	Water never been filled	Don't know	Other	Automatic (direct from source/ pipe)	Less than a week	Weekly	Every two weeks	Monthly	Other/ don't know
National	2,967	72%	16,268	19%	4%	70%	4%	2%	1%	32%	7%	4%	20%	15%	18%
Region															
Tigray	209	85%	17,458	33%	3%	59%	0%	2%	2%	23%	13%	5%	17%	15%	27%
Afar	38	79%	12,630	0%	3%	97%	0%	0%	0%	63%	13%	3%	10%	3%	7%
Amhara	621	57%	16,218	6%	3%	82%	7%	1%	2%	42%	3%	2%	17%	15%	14%
Oromia	1,121	77%	15,494	25%	2%	65%	4%	3%	1%	26%	7%	5%	19%	17%	22%
Somali	122	80%	16,941	26%	27%	38%	1%	3%	6%	24%	8%	14%	12%	28%	12%
Benishangul-Gumuz	41	63%	32,850	23%	0%	69%	4%	0%	4%	31%	4%	0%	12%	42%	8%
SNNP	613	65%	15,242	17%	3%	73%	7%	0%	0%	32%	7%	4%	26%	10%	16%
Gambella	21	43%	5,056	0%	0%	67%	33%	0%	0%	33%	0%	11%	22%	0%	0%
Harari	13	85%	17,273	0%	9%	91%	0%	0%	0%	45%	9%	45%	0%	0%	0%
Addis Ababa	151	96%	21,086	3%	2%	94%	1%	0%	0%	42%	4%	1%	32%	14%	6%
Dire Dawa	17	94%	9,187	0%	0%	94%	0%	0%	6%	44%	31%	13%	0%	13%	0%
Facility type															
Referral/specialized hospitals	30	97%	51,752	3%	3%	93%	0%	0%	0%	38%	3%	7%	38%	3%	10%
General hospitals	99	99%	31,741	1%	6%	92%	0%	0%	1%	37%	8%	2%	35%	10%	8%
Primary hospitals	152	92%	33,151	2%	3%	93%	1%	0%	1%	41%	8%	1%	31%	11%	7%
MCH specialty centres	23	96%	16,699	0%	5%	95%	0%	0%	0%	50%	5%	5%	18%	14%	9%
Health centres	2,635	69%	13,481	22%	4%	67%	5%	2%	1%	30%	7%	5%	18%	16%	19%
MCH specialty clinics	16	100%	22,548	0%	0%	100%	0%	0%	0%	19%	6%	6%	19%	31%	19%
Higher clinics	12	100%	18,731	17%	17%	67%	0%	0%	0%	50%	17%	25%	8%	0%	0%

	Number of facilities with a water source	Among facilities with a water source		Among facilities with a water tank, primary source of water						Among facilities with a water tank, frequency of filling					
		Has water tank	Average max volume of tank (litres)	Harvested rain	Truck/ vessel	Piped water	Water never been filled	Don't know	Other	Automatic (direct from source/ pipe)	Less than a week	Weekly	Every two weeks	Monthly	Other/ don't know
Managing authority															
Public/government	2,830	71%	15,916	20%	4%	69%	5%	2%	1%	31%	7%	4%	19%	16%	18%
Private-for-profit	79	97%	23,127	1%	5%	94%	0%	0%	0%	39%	9%	3%	27%	14%	8%
Private-not-for-profit[1]	58	93%	19,500	4%	6%	91%	0%	0%	0%	39%	6%	6%	31%	13%	6%
Location															
Urban	1,382	82%	18,917	9%	3%	84%	2%	1%	1%	36%	7%	5%	26%	15%	10%
Rural	1,585	62%	13,214	31%	4%	55%	7%	2%	1%	27%	7%	4%	13%	15%	26%

[1] Includes NGO, faith-based, or mission facilities.

Table 6.4.8A: Percent of facilities with a water source in selected maternal health service areas of the facility, among those facilities with a separate room for the service,[1] by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Antenatal room	Labour and delivery room	1st stage of labour room	Delivery room	Maternity room for complications	Postnatal room	Post caesarean room	General operating theatre	Ob/gyn operating theatre	Laboratory and mini blood bank room	Separate laboratory room	Separate mini blood bank room
National	39%	49%	50%	52%	66%	42%	85%	90%	88%	84%	54%	86%
Region												
Tigray	48%	58%	49%	60%	72%	45%	92%	94%	91%	95%	60%	91%
Afar	19%	35%	31%	33%	67%	27%	67%	86%	100%	0%	32%	
Amhara	36%	40%	53%	46%	55%	37%	67%	81%	73%	71%	49%	71%
Oromia	29%	41%	40%	44%	56%	35%	88%	96%	91%	83%	46%	87%
Somali	43%	49%	42%	48%	64%	41%	63%	80%	50%	100%	54%	50%
Benishangul-Gumuz	59%	68%	67%	61%	33%	61%	100%	100%	100%	100%	64%	
SNNP	46%	61%	58%	60%	75%	52%	88%	81%	86%	78%	63%	100%
Gambella	22%	67%	0%	50%	100%	67%		100%			50%	
Harari	60%	75%	50%	29%	50%	73%	83%	100%	100%	100%	77%	
Addis Ababa	80%	93%	89%	92%	92%	84%	100%	100%	100%	92%	95%	96%
Dire Dawa	50%	60%	53%	65%		36%	80%	100%	100%	100%	59%	
Facility type												
Referral/specialized hospitals	97%	95%	93%	96%	88%	96%	89%	93%	95%	100%	100%	92%
General hospitals	92%	99%	90%	93%	96%	87%	94%	98%	98%	98%	98%	97%
Primary hospitals	61%	84%	76%	82%	77%	70%	79%	85%	77%	84%	86%	78%
MCH specialty centres	95%	100%	95%	100%	100%	100%	100%	100%	100%	91%	100%	100%
Health centres	34%	45%	43%	47%	44%	37%	68%	64%	82%	47%	50%	43%
MCH specialty clinics	85%	88%	92%	93%	100%	90%	100%	100%	100%	100%	93%	100%
Higher clinics	80%	82%	78%	75%	80%	78%	50%	100%	0%		85%	100%
Managing authority												
Public/government	36%	47%	47%	50%	60%	40%	80%	88%	85%	81%	52%	81%
Private-for-profit	89%	95%	93%	93%	98%	94%	98%	98%	97%	95%	96%	96%
Private-not-for-profit[2]	85%	89%	93%	96%	100%	91%	100%	100%	100%	100%	91%	100%
Location												
Urban	56%	69%	68%	71%	77%	58%	86%	91%	88%	91%	73%	89%
Rural	26%	37%	32%	37%	37%	29%	77%	74%	92%	44%	39%	43%

[1] Shaded cells indicate that no facilities reported having the specified area. For example, no facilities in Dire Dawa reported having a maternity room for complications.

[2] Includes NGO, faith-based, or mission facilities.

Table 6.4.9A: Percent of facilities with a water source in newborn care areas of the facility, among those facilities with a separate room for the service,[1] by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	ICU	Newborn corner	NICU	Paediatrics ward	IMNCI clinic
National	89%	61%	87%	57%	39%
Region					
Tigray	100%	55%	89%	77%	49%
Afar	100%	75%	67%	50%	23%
Amhara	79%	46%	73%	35%	34%
Oromia	90%	61%	90%	65%	32%
Somali	67%	58%	80%	47%	24%
Benishangul-Gumuz	100%	100%	100%	83%	43%
SNNP	86%	69%	91%	56%	48%
Gambella		0%		67%	50%
Harari	50%	67%	100%	100%	100%
Addis Ababa	97%	91%	96%	96%	81%
Dire Dawa	100%	50%	100%	100%	0%
Facility type					
Referral/specialized hospitals	91%	92%	96%	93%	95%
General hospitals	95%	90%	95%	92%	98%
Primary hospitals	86%	81%	83%	70%	68%
MCH specialty centres	100%	100%	100%	100%	100%
Health centres	64%	54%	61%	37%	35%
MCH specialty clinics		100%		100%	100%
Higher clinics		100%		100%	100%
Managing authority					
Public/government	87%	58%	85%	52%	38%
Private-for-profit	100%	95%	100%	98%	97%
Private-not-for-profit[2]	83%	100%	100%	100%	90%
Location					
Urban	88%	75%	89%	67%	56%
Rural	100%	42%	68%	37%	27%

ICU = intensive care unit; IMNCI = integrated management of neonatal and childhood illness; NICU = neonatal intensive care unit.

[1] Shaded cells indicate that no facilities reported having the specified area. For example, no facilities in Gambella reported having a NICU.

[2] Includes NGO, faith-based, or mission facilities.

Table 6.4.10A: Percent of facilities with functioning toilets for clients and staff, by type of toilet, region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	No functioning toilet for anyone	Has functioning toilet for staff[1]	Among facilities with a functioning toilet/latrine for staff[2]					Has functioning toilet for clients[1]	Among facilities with a functioning toilet/latrine for clients[2]				
				Flush or pour flush	VIP latrine	Pit latrine with slab	Open pit	Composite		Flush or pour flush	VIP latrine	Pit latrine with slab	Open pit	Composite
National	3,804	2%	90%	14%	29%	38%	18%	1%	96%	9%	28%	41%	20%	1%
Region														
Tigray	255	2%	93%	28%	19%	47%	6%	0%	96%	20%	17%	57%	6%	0%
Afar	77	9%	91%	7%	60%	16%	16%	0%	91%	7%	60%	17%	16%	0%
Amhara	876	1%	89%	10%	30%	40%	20%	0%	96%	6%	30%	41%	23%	0%
Oromia	1,405	2%	86%	9%	28%	37%	24%	1%	97%	6%	27%	40%	26%	1%
Somali	161	7%	88%	8%	8%	39%	45%	0%	92%	7%	7%	43%	44%	0%
Benishangul-Gumuz	43	0%	100%	7%	56%	35%	0%	2%	100%	9%	56%	33%	2%	0%
SNNP	773	2%	93%	12%	36%	39%	11%	1%	97%	8%	36%	40%	14%	2%
Gambella	27	4%	93%	4%	4%	84%	4%	4%	89%	4%	8%	79%	4%	4%
Harari	15	0%	100%	27%	7%	67%	0%	0%	100%	27%	7%	67%	0%	0%
Addis Ababa	151	1%	96%	65%	14%	20%	1%	0%	98%	54%	20%	23%	3%	0%
Dire Dawa	21	0%	100%	33%	10%	57%	0%	0%	100%	24%	5%	71%	0%	0%
Facility type														
Referral/specialized hospitals	30	0%	100%	80%	7%	10%	3%	0%	100%	73%	10%	13%	3%	0%
General hospitals	103	0%	99%	56%	10%	18%	14%	0%	100%	49%	18%	17%	12%	1%
Primary hospitals	160	1%	96%	46%	25%	23%	3%	0%	99%	26%	31%	34%	5%	0%
MCH specialty centres	23	0%	100%	83%	0%	17%	0%	0%	100%	83%	0%	17%	0%	0%
Health centres	3,459	2%	89%	9%	30%	41%	20%	1%	96%	6%	29%	43%	22%	1%
MCH specialty clinics	16	0%	100%	94%	0%	0%	6%	0%	100%	88%	6%	0%	6%	0%
Higher clinics	13	0%	92%	67%	8%	8%	17%	0%	100%	46%	8%	23%	23%	0%
Managing authority														
Public/government	3,662	2%	89%	11%	29%	39%	19%	1%	96%	7%	29%	42%	21%	1%
Private-for-profit	83	0%	100%	87%	2%	5%	4%	0%	100%	80%	5%	10%	4%	0%
Private-not-for-profit[3]	59	0%	100%	49%	15%	29%	7%	0%	100%	44%	20%	29%	7%	0%

	Number of facilities	No functioning toilet for anyone	Has functioning toilet for staff[1]	Among facilities with a functioning toilet/latrine for staff[2]					Has functioning toilet for clients[1]	Among facilities with a functioning toilet/latrine for clients[2]				
				Flush or pour flush	VIP latrine	Pit latrine with slab	Open pit	Composite		Flush or pour flush	VIP latrine	Pit latrine with slab	Open pit	Composite
Location														
Urban	1,497	1%	92%	24%	28%	34%	13%	0%	99%	17%	29%	38%	15%	0%
Rural	2,307	3%	88%	7%	29%	41%	22%	1%	95%	4%	28%	43%	24%	1%

VIP = ventilated improved pit.

[1] Toilet for staff and clients are not necessarily mutually exclusive.

[2] Percent distributions may not sum to 100 percent, as "other" and "don't know" response options are not shown in this table.

[3] Includes NGO, faith-based, or mission facilities.

Table 6.5.1A: Percent of facilities with a functional mode of communication, by type of communication, region, facility type, managing authority, and location, Ethiopia EmONC, 2016

		On-site, facility-owned communication					Other modes of communication			
	Number of facilities	Functioning landline in facility (not specifically in maternity)	Functioning landline in maternity	Functioning cell phone (owned by facility)	Functioning 2-way radio	At least 1 mode of functional communication on-site	Functioning public telephone in vicinity	Functioning cell phone owned by individual staff	Facility has computer	Facility has access to the internet
National	3,804	25%	11%	11%	0%	36%	2%	92%	70%	7%
Region										
Tigray	255	28%	15%	5%	1%	34%	3%	97%	86%	6%
Afar	77	10%	5%	6%	0%	19%	0%	40%	62%	1%
Amhara	876	28%	8%	7%	0%	36%	2%	95%	75%	7%
Oromia	1,405	26%	8%	14%	0%	40%	3%	90%	77%	5%
Somali	161	7%	4%	14%	0%	19%	2%	91%	47%	6%
Benishangul-Gumuz	43	21%	19%	7%	0%	35%	0%	84%	88%	7%
SNNP	773	14%	7%	7%	0%	22%	1%	98%	42%	5%
Gambella	27	4%	0%	7%	0%	7%	0%	96%	70%	0%
Harari	15	13%	33%	0%	0%	40%	0%	47%	100%	27%
Addis Ababa	151	84%	77%	38%	1%	97%	12%	88%	95%	38%
Dire Dawa	21	10%	14%	33%	0%	57%	0%	67%	90%	24%
Facility type										
Referral/specialized hospitals	30	80%	67%	20%	10%	93%	17%	77%	100%	83%
General hospitals	103	85%	60%	33%	1%	97%	17%	81%	97%	57%
Primary hospitals	160	60%	36%	20%	0%	77%	11%	91%	98%	38%
MCH specialty centres	23	61%	78%	52%	0%	96%	9%	78%	87%	52%
Health centres	3,459	21%	7%	10%	0%	31%	1%	93%	67%	3%
MCH specialty clinics	16	63%	56%	38%	6%	88%	0%	88%	69%	19%
Higher clinics	13	69%	15%	38%	0%	77%	0%	77%	77%	23%

		On-site, facility-owned communication					Other modes of communication			
	Number of facilities	Functioning landline in facility (not specifically in maternity)	Functioning landline in maternity	Functioning cell phone (owned by facility)	Functioning 2-way radio	At least 1 mode of functional communication on-site	Functioning public telephone in vicinity	Functioning cell phone owned by individual staff	Facility has computer	Facility has access to the internet
Managing authority										
Public/government	3,662	24%	9%	10%	0%	34%	2%	92%	69%	5%
Private-for-profit	83	77%	57%	46%	0%	95%	11%	77%	87%	45%
Private-not-for-profit[1]	59	44%	36%	27%	7%	68%	5%	90%	75%	34%
Location										
Urban	1,497	49%	23%	16%	1%	63%	5%	91%	88%	15%
Rural	2,307	9%	3%	8%	0%	18%	1%	92%	58%	1%

[1] Includes NGO, faith-based, or mission facilities.

Table 6.6.1A: Percent of facilities with a system in place to collect MNH service data and system characteristics, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	System in place to collect MNH service data	Compiles reports with MNH service data					Routinely calculates indicators				Has person responsible for MNH service data
			Weekly	Monthly	Quarterly	Other	Total	Institutional delivery	Institutional caesarean rate	Institutional stillbirth rate	Institutional low birth weight rate	
National	3,804	97%	5%	90%	1%	0%	96%	84%	7%	50%	56%	67%
Region												
Tigray	255	100%	0%	98%	1%	0%	100%	91%	16%	69%	72%	89%
Afar	77	91%	0%	87%	3%	1%	91%	57%	6%	36%	42%	56%
Amhara	876	98%	5%	92%	1%	0%	98%	83%	5%	52%	55%	73%
Oromia	1,405	98%	7%	90%	1%	1%	98%	89%	6%	49%	57%	56%
Somali	161	80%	1%	75%	4%	0%	80%	57%	7%	34%	38%	37%
Benishangul-Gumuz	43	91%	7%	84%	0%	0%	91%	91%	5%	88%	86%	56%
SNNP	773	95%	8%	86%	1%	0%	95%	88%	7%	48%	55%	79%
Gambella	27	96%	0%	96%	0%	0%	96%	41%	4%	11%	19%	59%
Harari	15	100%	0%	100%	0%	0%	100%	7%	7%	7%	7%	80%
Addis Ababa	151	99%	2%	96%	1%	0%	99%	84%	28%	62%	66%	85%
Dire Dawa	21	100%	0%	100%	0%	0%	100%	10%	0%	10%	10%	95%
Facility type												
Referral/specialized hospitals	30	100%	0%	93%	7%	0%	100%	83%	90%	80%	73%	100%
General hospitals	103	100%	2%	98%	0%	0%	100%	83%	82%	78%	77%	92%
Primary hospitals	160	98%	3%	89%	5%	1%	98%	84%	67%	75%	72%	87%
MCH specialty centres	23	96%	0%	91%	4%	0%	96%	61%	52%	43%	52%	48%
Health centres	3,459	96%	6%	89%	1%	0%	96%	85%	1%	48%	55%	66%
MCH specialty clinics	16	94%	6%	88%	0%	0%	94%	63%	19%	38%	38%	50%
Higher clinics	13	92%	0%	92%	0%	0%	92%	54%	15%	46%	46%	31%

	Number of facilities	System in place to collect MNH service data	Compiles reports with MNH service data					Routinely calculates indicators				Has person responsible for MNH service data
			Weekly	Monthly	Quarterly	Other	Total	Institutional delivery	Institutional caesarean rate	Institutional stillbirth rate	Institutional low birth weight rate	
Managing authority												
Public/government	3,662	97%	6%	89%	1%	0%	96%	85%	6%	50%	56%	68%
Private-for-profit	83	96%	1%	93%	1%	1%	96%	63%	54%	52%	57%	65%
Private-not-for-profit[1]	59	98%	0%	95%	3%	0%	98%	83%	22%	61%	64%	63%
Location												
Urban	1,497	97%	3%	92%	2%	0%	97%	85%	16%	51%	56%	80%
Rural	2,307	96%	7%	88%	1%	0%	96%	84%	2%	50%	56%	59%

[1] Includes NGO, faith-based, or mission facilities.

Table 7.1.1A: Number of health workers recommended by human resource standards, currently employed, and gaps, by health worker cadre and facility type, Ethiopia EmONC, 2016

	Minimum number of health workers required to meet standard[1,2]							Number of health workers currently employed								Number above minimum (number below minimum)[2]						
	All facilities	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	All facilities	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics	All facilities	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics
Health worker cadre																						
MD (general practitioner)	2,725	780	1,442	480	23	0	0	3,903	1,845	1,123	853	5	62	5	10	1,168	1,065	(319)	373	(18)	62	5
Obstetrician/gynaecologist	328	60	206	0	46	0	16	382	141	127	19	58	8	20	9	45	81	(79)	19	12	8	4
General surgeon	296	90	206	0	0	0	0	347	188	125	32	0	0	0	2	49	98	(81)	32	0	0	0
Paediatrician	239	90	103	0	46	0	0	246	124	74	8	33	1	2	4	3	34	(29)	8	(13)	1	2
Neonatologist	99	30	0	0	69	0	0	17	8	6	1	2	0	0	0	(82)	(22)	6	1	(67)	0	0
Emergency surgical officer	160	0	0	160	0	0	0	476	21	138	287	2	28	0	0	316	21	138	127	2	28	0
Midwife	13,161	720	1,339	640	69	10,377	16	12,153	826	1,214	1,113	101	8,819	42	38	(1,046)	106	(125)	473	32	(1,558)	26
Nurse	36,494	5,100	9,991	4,000	92	17,295	16	44,740	6,813	6,088	4,121	210	27,407	53	48	8,198	1,713	(3,903)	121	118	10,112	37
Health officer	7,238	0	0	320	0	6,918	0	7,712	225	288	408	12	6,769	6	4	470	225	288	88	12	(149)	6
Anaesthesiologist (MD)	186	60	103	0	23	0	0	37	18	19	0	0	0	0	0	(149)	(42)	(84)	0	(23)	0	0
Nurse anaesthetist	1,290	420	824	0	46	0	0	989	377	298	246	31	32	5	0	(301)	(43)	(526)	246	(15)	32	5
Laboratory technician	7,863	300	309	320	0	6,918	16	7,699	834	968	843	55	4,944	27	28	(192)	534	659	523	55	(1,974)	11
Pharmacist/druggist	12,833	420	1,030	960	46	10,377	0	7,614	1,175	960	857	43	4,562	7	10	(5,229)	755	(70)	(103)	(3)	(5,815)	7
Health information technologist	486	120	206	160	0	0	0	2,116	127	142	201	7	1,636	1	2	1,628	7	(64)	41	7	1,636	1

[1] Source: Food, Medicine and Health Care Administration and Control Authority (FMHACA), National Minimum Standard for Health Center, Primary and General Hospitals, November 2011, Addis Ababa.

[2] National standards for higher clinics was not available and complete to calculate the gaps.

[3] Health worker gaps for 'All facilities' exclude higher clinics, as standards were not available for that level of facility.

Table 7.2.2A: Percent of health workers on extended leave, providing delivery services, and trained in EmONC, by health worker cadre and managing authority, Ethiopia EmONC, 2016

	Public/government n=3,662							Private-for-profit n=83							Private-not-for-profit[1] n=59						
	Number of health workers currently employed	On extended leave	Providing obstetric/ newborn care	Trained in BEmONC	Trained in CEmONC	Trained for NICU	Trained in essential newborn care/HBB	Number of health workers currently employed	On extended leave	Providing obstetric/ newborn care	Trained in BEmONC	Trained in CEmONC	Trained for NICU	Trained in essential newborn care/HBB	Number of health workers currently employed	On extended leave	Providing obstetric/ newborn care	Trained in BEmONC	Trained in CEmONC	Trained for NICU	Trained in essential newborn care/HBB
Health worker cadre																					
MD (general practitioner)	3,513	10%	24%	3%	2%	4%	12%	340	1%	43%	25%	25%	27%	27%	50	2%	30%	8%	8%	4%	12%
Obstetrician/ gynaecologist	200	3%	89%	48%	54%	36%	42%	156	2%	99%	53%	58%	35%	42%	26	0%	96%	69%	69%	58%	65%
General surgeon	262	6%	25%	13%	16%	13%	16%	74	4%	38%	20%	26%	16%	16%	11	0%	45%	0%	0%	0%	0%
Paediatrician	150	1%	60%	13%	11%	31%	33%	89	2%	54%	17%	15%	21%	25%	7	14%	43%	14%	14%	29%	29%
Neonatologist	12	0%	50%	8%	8%	17%	17%	5	0%	40%	20%	20%	20%	20%	0						
Emergency surgical officer	459	2%	84%	22%	38%	15%	28%	13	0%	69%	62%	62%	46%	38%	4	0%	50%	0%	0%	0%	0%
Midwife	11,621	3%	40%	22%	2%	4%	16%	314	1%	52%	24%	11%	11%	27%	218	2%	43%	22%	4%	4%	11%
Nurse	42,068	3%	22%	2%	0%	1%	4%	1,795	0%	21%	6%	5%	6%	8%	877	3%	16%	3%	1%	1%	5%
Health officer	7,543	4%	61%	5%	1%	1%	8%	75	1%	31%	11%	8%	3%	13%	94	1%	50%	9%	3%	1%	11%
Anaesthesiologist (MD)	18	0%	6%	0%	0%	0%	0%	18	6%	50%	22%	22%	22%	22%	1	0%	0%	0%	0%	0%	0%
Nurse anaesthetist	835	1%	15%	1%	0%	0%	2%	119	0%	6%	0%	0%	0%	0%	35	0%	0%	0%	0%	0%	0%
Laboratory technician	7,154	16%	3%	0%	0%	1%	0%	371	1%	9%	0%	0%	0%	0%	174	2%	2%	0%	0%	0%	0%

HBB = helping babies breathe; NICU = neonatal intensive care unit.

[1] Includes NGO, faith-based, or mission facilities.

Table 7.4.1A: Regulatory policies for EmONC signal functions, by health worker cadre, Ethiopia EmONC, 2016

	Parenteral antibiotics	Parenteral uterotonics	Parenteral anti-convulsants	Manual removal of placenta	Removal of retained products		Assisted vaginal delivery		Newborn resuscitation with bag and mask	Caesarean delivery	Blood transfusion[1]	Anaesthesia adminis-tration
					MVA	E&C or D&C	Vacuum extraction	Forceps				
Health worker cadre												
MD (general practitioner)	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y
Obstetrician /gynaecologist	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
General surgeon	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Paediatrician/ neonatologist	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N
Midwife (BSc)	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	N
Midwife (Diploma)	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	N
Nurse (BSc)	Y	Y	Y	Y	Y	N	Y	N	Y	N	N	N
Nurse (Diploma)	Y	Y			Y	N	Y	N	Y	N	N	N
Health officer	Y	Y	Y	Y	Y	Y	Y	Y	Y			
Anaesthesiologist (MD)	Y	Y	Y	N	N	N	N	N	Y	N	Y	Y
Nurse anaesthetist	Y	Y	Y	N	N	N	N	N	Y	N	Y	Y

Y = Yes, the national policy stipulates that this cadre of health worker be trained in this area.

N = No, the national policy does not stipulate that this cadre of health worker be trained in this area.

Shaded cells indicate that task-shifting is occurring and that regulatory policy is unclear.

Source: FMOH, UNICEF, UNFPA, WHO, AMDD. National Baseline Assessment for Emergency Obstetric & Newborn Care, Ethiopia 2008. Addis Ababa, 2009.

[1] Blood transfusion: Y = decides transfusion is indicated; N = does not make the decision but may perform the transfusion.

Table 7.4.5A: Percent of hospitals/MCH specialty centres with at least one health worker who can provide the EmONC and EmNeC signal functions and other essential services, by region, Ethiopia EmONC, 2016

	National	Region										
		Tigray	Afar	Amhara	Oromia	Somali	Benishangul-Gumuz	SNNP	Gambella	Harari	Addis Ababa	Dire Dawa
All hospitals/MCH specialty centres	n=316	n=40	n=7	n=58	n=77	n=10	n=3	n=60	n=1	n=7	n=47	n=6
EmONC signal functions												
Parenteral antibiotics	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Parenteral uterotonics	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%	100%	100%
Parenteral anticonvulsants	99%	100%	100%	98%	100%	100%	100%	97%	100%	100%	100%	100%
Manual removal of placenta	99%	100%	100%	97%	100%	90%	100%	100%	100%	100%	100%	83%
Removal of retained products												
MVA	95%	100%	100%	93%	99%	90%	67%	92%	100%	100%	94%	83%
E&C or D&C	83%	80%	100%	72%	94%	90%	67%	78%	100%	71%	89%	67%
Medical abortion	88%	100%	100%	81%	94%	80%	67%	82%	0%	71%	94%	67%
Assisted vaginal delivery												
Vacuum extraction	95%	100%	100%	88%	99%	90%	67%	95%	100%	100%	96%	67%
Forceps	85%	83%	100%	84%	88%	90%	67%	78%	100%	71%	91%	83%
Caesarean delivery	83%	78%	86%	79%	91%	80%	67%	72%	100%	71%	96%	83%
Blood transfusion	79%	78%	86%	71%	86%	100%	67%	63%	100%	86%	94%	83%
EmNeC signal functions												
Newborn resuscitation with bag and mask	99%	100%	100%	98%	100%	100%	100%	98%	100%	100%	96%	100%
Antenatal corticosteroids	87%	88%	100%	81%	94%	90%	100%	78%	100%	100%	89%	100%
Antibiotics for pPROM	98%	98%	100%	98%	100%	100%	100%	97%	100%	100%	96%	100%
Antibiotics for neonatal sepsis	97%	95%	100%	97%	99%	100%	100%	98%	100%	100%	96%	83%
KMC for small babies	94%	95%	100%	97%	96%	90%	100%	97%	100%	100%	83%	83%
Safe administration of oxygen	95%	100%	100%	86%	100%	100%	67%	92%	100%	100%	98%	83%
IV fluids	91%	95%	100%	81%	95%	100%	100%	92%	100%	71%	91%	67%
Other essential services												
Focused ANC	98%	100%	100%	98%	100%	100%	100%	98%	100%	100%	96%	83%
Normal delivery	98%	100%	100%	98%	99%	100%	100%	98%	100%	100%	96%	100%
Fill out and use partograph	94%	100%	100%	91%	100%	100%	67%	95%	100%	71%	85%	67%
Immediate newborn care	99%	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%	83%
PMTCT	97%	98%	100%	90%	99%	90%	67%	98%	100%	100%	100%	100%
FP counselling	98%	100%	100%	98%	97%	100%	100%	98%	100%	100%	98%	100%
Temporary FP methods	98%	100%	100%	97%	99%	100%	100%	97%	100%	100%	96%	100%
Long acting reversible FP methods	93%	100%	100%	90%	92%	80%	100%	93%	100%	86%	94%	83%
Tubal ligation	67%	65%	43%	57%	77%	50%	67%	60%	100%	57%	87%	50%
Vasectomy	49%	43%	43%	47%	45%	50%	67%	45%	0%	57%	70%	50%

ANC = antenatal care; D&C = dilation and curettage; E&C = evacuation and curettage; FP = family planning; KMC = kangaroo mother care; MVA = manual vacuum aspiration; PMTCT = prevention of mother-to-child transmission (of HIV); pPROM = preterm premature rupture of membranes.

Table 7.4.6A: Percent of health centres/clinics with at least one health worker who can provide the EmONC and EmNeC signal functions and other essential services, by region, Ethiopia EmONC, 2016

	National	Region										
		Tigray	Afar	Amhara	Oromia	Somali	Benishangul-Gumuz	SNNP	Gambella	Harari	Addis Ababa	Dire Dawa
All health centres/clinics[1]	n=3,488	n=215	n=70	n=818	n=1,328	n=151	n=40	n=713	n=26	n=8	n=104	n=15
EmONC signal functions												
Parenteral antibiotics	99%	100%	100%	99%	99%	97%	100%	98%	100%	100%	99%	100%
Parenteral uterotonics	99%	100%	99%	100%	99%	96%	98%	99%	96%	100%	99%	100%
Parenteral anticonvulsants	87%	98%	83%	92%	88%	85%	90%	74%	85%	100%	95%	100%
Manual removal of placenta	97%	100%	87%	98%	98%	85%	100%	96%	100%	100%	99%	100%
Removal of retained products												
MVA	53%	82%	59%	54%	52%	23%	55%	49%	27%	63%	67%	80%
E&C or D&C	11%	25%	51%	11%	6%	5%	40%	9%	15%	0%	22%	0%
Medical abortion	38%	75%	46%	38%	34%	19%	68%	35%	19%	75%	58%	93%
Assisted vaginal delivery												
Vacuum extraction	53%	80%	60%	61%	48%	41%	58%	40%	31%	88%	82%	87%
Forceps	9%	8%	43%	7%	8%	15%	20%	8%	15%	0%	13%	0%
Caesarean delivery	1%	1%	3%	0%	1%	2%	5%	2%	4%	0%	4%	0%
Blood transfusion	1%	2%	3%	0%	1%	3%	10%	0%	0%	0%	8%	0%
EmNeC signal functions												
Newborn resuscitation with bag and mask	98%	99%	81%	99%	99%	92%	98%	99%	100%	100%	98%	100%
Antenatal corticosteroids	31%	35%	76%	26%	37%	38%	35%	18%	31%	50%	31%	7%
Antibiotics for pPROM	81%	90%	86%	85%	89%	72%	90%	57%	65%	75%	93%	67%
Antibiotics for neonatal sepsis	88%	81%	86%	92%	89%	88%	95%	84%	88%	100%	73%	93%
KMC for small babies	91%	96%	74%	97%	92%	72%	98%	90%	62%	38%	96%	73%
Safe administration of oxygen	17%	17%	47%	19%	10%	22%	38%	12%	27%	38%	87%	67%
IV fluids	33%	35%	80%	31%	30%	62%	78%	28%	42%	38%	32%	13%
Other essential services												
Focused ANC	100%	100%	96%	100%	100%	99%	100%	99%	100%	100%	100%	100%
Normal delivery	100%	100%	99%	100%	100%	98%	100%	100%	100%	100%	100%	100%
Fill out and use partograph	90%	99%	71%	97%	88%	54%	95%	92%	65%	100%	99%	100%
Immediate newborn care	100%	100%	97%	100%	100%	94%	100%	100%	100%	100%	100%	100%
PMTCT	88%	100%	84%	91%	84%	46%	95%	95%	77%	100%	98%	80%
FP counselling	99%	99%	97%	100%	100%	96%	100%	99%	100%	100%	99%	100%
Temporary FP methods	99%	99%	99%	100%	100%	95%	100%	98%	96%	100%	98%	100%
Long acting reversible FP methods	91%	97%	87%	94%	93%	49%	100%	88%	88%	100%	96%	100%
Tubal ligation	2%	2%	3%	1%	1%	1%	0%	2%	0%	0%	5%	0%
Vasectomy	1%	1%	1%	0%	1%	1%	0%	1%	0%	0%	3%	0%

ANC = antenatal care; D&C = dilation and curettage; E&C = evacuation and curettage; FP = family planning; KMC = kangaroo mother care; MVA = manual vacuum aspiration; PMTCT = prevention of mother-to-child transmission (of HIV); pPROM = preterm premature rupture of membranes.

[1] Includes MCH specialty clinics and higher clinics.

Table 7.6.1A: Percent of facilities with minimum human resource (HR) team and availability of HR performing the signal functions in 2008 and 2016, by facility type and managing authority, Ethiopia EmONC, 2016

	Facility type				Managing authority					
	Hospitals/MCH specialty centres		Health centres/clinics[1]		Public/government		Private-for-profit		Private-not-for-profit[2]	
	2008	2016	2008	2016	2008	2016	2008	2016	2008	2016
	n=112	n=316	n=685	n=3,488	n=750	n=3,662	n=27	n=83	n=20	n=59
Minimum team available (at least 1 midwife and 1 nurse)	96%	97%	64%	96%	68%	97%	94%	93%	74%	90%
Availability of at least one health worker performing the signal function (%)										
Parenteral antibiotics	100%	100%	97%	99%	97%	99%	100%	99%	95%	98%
Parenteral uterotonics	98%	100%	89%	99%	90%	99%	94%	100%	90%	95%
Parenteral anticonvulsants	96%	99%	63%	87%	67%	87%	100%	95%	84%	86%
Manual removal of placenta	100%	99%	96%	97%	96%	97%	100%	98%	100%	98%
Removal of retained products	97%	96%	49%	54%	54%	61%	100%	90%	74%	73%
Assisted vaginal delivery	98%	98%	45%	54%	51%	57%	100%	98%	84%	76%
Newborn resuscitation with bag and mask	94%	99%	64%	98%	67%	98%	100%	95%	84%	98%
Caesarean delivery	82%	83%	4%	1%	13%	6%	94%	71%	42%	27%
Blood transfusion	79%	79%	2%	1%	11%	6%	88%	86%	37%	27%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 8.2.1A: Percent of providers who provided selected services in the past 3 months and received training on the service, by health worker cadre, Ethiopia EmONC, 2016

	Total		Midwives		Nurses		Health officers	
	n=3,792		n=3,193		n=456		n=143	
	Provided the service in the past 3 months	Ever received training on the service	Provided the service in the past 3 months	Ever received training on the service	Provided the service in the past 3 months	Ever received training on the service	Provided the service in the past 3 months	Ever received training on the service
Active management of the third stage of labour (AMTSL)	98%	84%	98%	87%	93%	67%	97%	73%
Counsel women about contraception	96%	78%	96%	80%	93%	67%	94%	71%
Provide postnatal care (inpatient or outpatient)	96%	80%	97%	83%	89%	66%	87%	72%
Begin IV fluids	95%	85%	96%	87%	90%	78%	97%	78%
Provide focused antenatal care	93%	75%	94%	78%	90%	59%	93%	65%
Provide essential newborn care	92%	81%	93%	84%	90%	64%	87%	66%
Suture an episiotomy	82%	83%	84%	86%	68%	63%	71%	71%
Use the partograph	80%	84%	84%	88%	57%	60%	59%	71%
Resuscitate a newborn with bag and mask	76%	80%	77%	83%	65%	65%	75%	68%
Perform manual removal of the placenta	67%	79%	68%	82%	59%	56%	59%	66%
Suture vaginal lacerations	64%	73%	66%	76%	49%	52%	57%	64%
Provide kangaroo mother care	58%	77%	60%	80%	49%	57%	52%	61%
Perform emergency triage assessment and treatment	37%	41%	37%	42%	37%	36%	46%	49%
Administer antiretrovirals for PMTCT	35%	54%	38%	58%	22%	35%	17%	45%
Do bimanual uterine compression (external)	34%	68%	35%	73%	28%	39%	34%	52%
Provide antibiotics for neonatal infections	33%	57%	32%	58%	37%	49%	46%	66%
Perform a vacuum assisted delivery	32%	66%	35%	72%	15%	36%	20%	45%
Perform adult resuscitation	28%	59%	28%	59%	30%	55%	42%	64%
Perform manual vacuum aspiration	24%	56%	26%	60%	14%	29%	17%	45%
Administer IM or IV magnesium sulphate to treat severe PE/E	24%	70%	25%	75%	14%	38%	19%	55%
Do bimanual uterine compression (internal)	22%	62%	24%	67%	14%	31%	15%	45%
Provide antenatal corticosteroids for women at risk of preterm birth	15%	34%	15%	36%	12%	22%	13%	33%
Suture cervical lacerations	6%	26%	6%	28%	5%	17%	6%	23%
Perform a forceps assisted delivery	3%	29%	3%	30%	4%	20%	1%	29%

PE/E = pre-eclampsia/eclampsia; PMTCT = prevention of mother-to-child transmission (of HIV).

Table 8.3.1A: Provider knowledge scores and percent of providers with knowledge of aspects of antenatal care, by health worker cadre, Ethiopia EmONC, 2016

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
What are the primary aspects of focused antenatal care?				
Average knowledge score (out of 100)	57	58	50	57
Percent providing specific response:				
Prevent illness and promote health (e.g. tetanus toxoid vaccine, iron tablets, protection against malaria, eMTCT)	77%	78%	69%	79%
Teach the danger signs (of pregnancy, childbirth, and the postpartum period)	75%	77%	62%	68%
Maternal nutrition counselling	65%	67%	57%	56%
Minimum of 4 consultation visits	64%	64%	59%	62%
Detect existing illnesses and manage complications	56%	57%	48%	59%
Ensure woman has birth plan	55%	56%	47%	58%
Counselling on family planning	35%	36%	31%	36%
Promote breastfeeding	32%	32%	30%	38%
What are the elements that need to be included in a birth plan?				
Average knowledge score (out of 100)	58	59	46	53
Percent providing specific response:				
Set aside money	81%	83%	64%	72%
Decide on a place of birth	80%	80%	77%	83%
Prepare for emergency transport	62%	65%	46%	53%
Identify caregivers for children or animals	44%	46%	33%	42%
Identify potential blood donors	22%	24%	10%	16%
Which women require a special care plan?				
Average knowledge score (out of 100)	33	32	30	42
Percent providing specific response:				
History of severe obstetric complications (e.g. PE/E, gestational diabetes, DVT, APH, PPH, preterm labour, etc.)	85%	86%	79%	85%
Women who have non-communicable diseases (e.g. diabetes, cardiac disease)	61%	62%	57%	71%
Women who have had a caesarean	54%	54%	49%	66%
Previous stillbirth	33%	33%	30%	49%
Women <18 or >40 years of age	24%	24%	23%	36%
Women with ≥5 deliveries	21%	20%	21%	36%
Previous neonatal death	19%	19%	15%	31%
Previous instrumental delivery	11%	10%	12%	18%
Previous obstetric fistula repair	10%	9%	10%	17%
Interval <2 years or >5 years between pregnancies	8%	8%	7%	14%

APH = antepartum haemorrhage; DVT = deep vein thrombosis; eMTCT = elimination of mother-to-child transmission (of HIV); PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

Table 8.4.1A: Provider knowledge scores and percent of providers with knowledge of intrapartum care, by health worker cadre, Ethiopia EmONC, 2016

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
Which pregnant women require referral or admission before onset of labour?				
Average knowledge score (out of 100)	42	42	37	48
Percent providing specific response:				
Severe nausea and vomiting (hyperemesis gravidarum)	13%	12%	14%	17%
Severe pre-eclampsia/eclampsia	83%	84%	76%	88%
Premature rupture of foetal membranes (PROM)	46%	48%	32%	57%
Antepartum haemorrhage	62%	63%	58%	69%
Deep vein thrombosis	5%	5%	5%	6%
Uncontrolled chronic medical disorders (e.g. diabetes, cardiac disease, asthma)	42%	43%	39%	50%
For a woman in labour, what observations do you make as you monitor her progress?				
Average knowledge score (out of 100)	72	75	56	70
Percent providing specific response:				
Foetal heartbeat	95%	96%	89%	90%
Colour of amniotic fluid	56%	59%	33%	55%
Degree of moulding	51%	55%	23%	47%
Dilatation of the cervix	91%	92%	84%	95%
Descent of the head	67%	71%	44%	62%
Uterine contractions	80%	82%	62%	84%
Maternal blood pressure	93%	94%	87%	87%
Maternal temperature	79%	82%	63%	82%
Maternal pulse	80%	83%	62%	79%
Urine output	32%	35%	13%	17%
What are the actions taken during AMTSL?				
Average knowledge score (out of 100)	87	90	68	83
Percent providing specific response:				
Immediate uterotonic (within 1-2 mins)	93%	95%	79%	92%
Controlled cord traction	88%	91%	73%	83%
Check uterine tone and massage if soft	80%	84%	51%	73%

AMTSL = active management of the third stage of labour.

Table 8.4.2A: Provider knowledge scores and percent of providers with knowledge of selected care processes related to the management of obstetric complications, by health worker cadre, Ethiopia EmONC, 2016

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
What are the management principles for women with ≥1 previous caesarean delivery and uterine scar?				
Average knowledge score (out of 100)	48	49	42	57
Percent providing specific response:				
Refer to a higher facility with caesarean capacity	93%	93%	91%	94%
Assess eligibility or prerequisites for VBAC in hospital	28%	29%	15%	45%
Admit all women to hospital with ≥2 uterine scars	24%	24%	21%	33%
What are the management principles for women with PROM?				
Average knowledge score (out of 100)	37	38	26	47
Percent providing specific response:				
Administer antibiotics for all preterm and prolonged term PROM	76%	81%	46%	76%
Admit women to hospital and follow with PROM chart until delivery	51%	51%	45%	57%
Avoid digital pelvic examination until onset of labour, or time that delivery is planned	25%	26%	17%	33%
Plan delivery in case of chorioamnionitis/foetal distress/IUFD/anomalous baby/prolonged term PROM	19%	19%	11%	39%
Administer corticosteroids for all very preterm PROM	14%	14%	9%	32%
When a woman develops heavy bleeding after delivery, what do you do?				
Average knowledge score (out of 100)	50	52	40	50
Percent providing specific response:				
Begin IV fluids	91%	92%	86%	92%
Give ergometrine or oxytocin (IV or IM) or misoprostol or tranexamic acid	75%	76%	70%	78%
Refer	67%	66%	74%	69%
Manually remove retained products	62%	65%	42%	62%
Massage the fundus	62%	65%	41%	55%
Examine woman for lacerations	60%	62%	38%	65%
Bimanual uterine compression	55%	59%	25%	52%
Take blood for haemoglobin and cross-matching	13%	14%	9%	17%
Empty bladder	11%	12%	7%	9%
Insert balloon tamponade	6%	6%	5%	7%
When would you give a loading dose of magnesium sulphate?				
Would never give magnesium sulphate	13%	12%	20%	13%
Average knowledge score (out of 100) among those who would give magnesium sulphate	50	52	33	51
Percent providing specific response:				
When a pregnant woman or recently delivered woman shows signs of severe pre-eclampsia	79%	82%	53%	82%
When a pregnant or recently delivered woman has a seizure	67%	70%	43%	68%
When authorized by a superior	3%	3%	4%	4%

IUFD = intrauterine foetal death; PROM = premature rupture of membranes; VBAC = vaginal birth after caesarean

Table 8.4.3A: Provider knowledge scores and percent of providers who know steps of immediate newborn care and key counselling messages related to cord care and first bath, by health worker cadre, Ethiopia EmONC, 2016

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
What do you do for the newborn following delivery?				
Average knowledge score (out of 100)	67	68	60	66
Percent providing specific response:				
Deliver the baby skin-to-skin onto the mother's abdomen/chest	73%	75%	59%	65%
Dry the baby's body	84%	85%	74%	82%
Cover the baby with a dry towel	67%	67%	65%	73%
Assess the baby's breathing	63%	63%	63%	71%
Clamp cord (after 1-3 minutes)	90%	91%	83%	88%
Provide chlorhexidine gel for cord care	20%	20%	18%	24%
Ensure baby is kept warm (skin-to-skin)	62%	63%	53%	60%
Initiate breastfeeding (within 60 minutes)	71%	72%	62%	70%
Apply tetracycline eye ointment once (within 60 minutes)	83%	85%	75%	79%
Give vitamin K (after 60 minutes)	87%	89%	75%	81%
Weigh the baby (after 90 minutes)	69%	71%	55%	58%
Give BCG	50%	50%	50%	55%
Give polio 0	56%	57%	54%	57%
What are key counselling messages related to cord care?				
Average knowledge score (out of 100)	50	51	44	49
Percent providing specific response:				
Put nothing on the cord while waiting for the cord to fall off	86%	87%	78%	78%
Cord should remain dry	75%	77%	67%	73%
Give sponge baths until cord falls off	24%	25%	19%	25%
Apply chlorhexidine for cord care for 7 days	14%	14%	13%	20%
How many hours after birth would you recommend that the baby have its first bath?				
Percent who replied 24 hours	96%	97%	93%	94%

Table 8.4.4A: Provider knowledge scores and percent of providers who know signs of newborn complications and the appropriate responses, by health worker cadre, Ethiopia EmONC, 2016

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
When a newborn weighs <2,000 grams, what special care do you provide?				
Average knowledge score (out of 100)	37	38	32	39
Percent providing specific response:				
Ensure the baby is warm with skin-to-skin with mother, if stable (KMC)	85%	87%	73%	82%
Provide extra support to the mother to establish breastfeeding	55%	56%	50%	55%
Monitor ability to breastfeed	48%	48%	40%	55%
Ensure baby is warm by placing in incubator	46%	46%	43%	45%
Ensure baby is warm by placing in radiant warmer	44%	46%	36%	39%
Assess for danger signs	18%	18%	16%	24%
Assess for breathing difficulties (need for O_2 supplementation)	15%	15%	12%	23%
Ensure infection prevention	15%	16%	13%	18%
Monitor baby for first 24 hours	11%	12%	9%	14%
What are the signs and symptoms of infection, or sepsis, in the newborn?				
Average knowledge score (out of 100)	42	42	36	54
Percent providing specific response:				
Temperature ≥38º C (hyperthermia)	79%	79%	72%	92%
Poor feeding on observation	61%	62%	51%	73%
Severe chest in-drawing	31%	31%	27%	45%
Movement only with stimulation	20%	20%	16%	28%
Temperature <35.5º C (hypothermia)	17%	16%	14%	34%
What are the signs of critical illness for a newborn baby indicating referral?				
Average knowledge score (out of 100)	32	32	31	40
Percent providing specific response:				
Unable to feed	79%	80%	75%	82%
Respiratory distress	61%	61%	61%	69%
Cyanosis	30%	31%	26%	40%
Weak or absent cry	29%	30%	28%	28%
Excessive cry	28%	28%	26%	29%
Lethargic	25%	24%	25%	38%
Persistent jaundice	22%	23%	16%	35%
Seizure	22%	21%	23%	38%
Comatose	18%	17%	21%	26%
Bulging fontanelle	8%	7%	8%	18%
How would you diagnose birth asphyxia?				
Average knowledge score (out of 100)	46	46	40	51
Percent providing specific response:				
Depressed/no breathing	83%	83%	77%	90%
Cyanosis	43%	42%	40%	54%
Heart rate <100 beats per minute	30%	31%	23%	38%
Floppiness	27%	28%	19%	22%
What are the steps of neonatal resuscitation?				
Average knowledge score (out of 100)	49	51	39	46
Percent providing specific response:				
Call for help	20%	20%	17%	24%

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
Explain to mother condition of baby	16%	17%	11%	16%
Place the newborn face up	49%	51%	38%	45%
Wrap or cover baby, except for face and upper portion of chest	41%	43%	28%	38%
Position baby's head so neck is slightly extended	56%	59%	41%	44%
Clear secretions if seen	77%	79%	65%	69%
Start ventilation using bag and mask	85%	86%	75%	84%
Percent observed to mention the steps in sequential order	14%	14%	14%	18%

KMC = kangaroo mother care.

Table 8.5.1A: Provider knowledge scores and percent of providers who know components of postnatal and postpartum care, by health worker cadre, Ethiopia EmONC, 2016

	Total	Midwives	Nurses	Health officers
	n=3,792	n=3,193	n=456	n=143
What do you check for the baby during a postnatal visit?				
Average knowledge score (out of 100)	49	49	44	54
Percent providing specific response:				
Baby breastfeeding well	86%	86%	79%	86%
Umbilical cord stump	79%	81%	69%	68%
Fever of baby	48%	48%	44%	66%
Proper positioning for breastfeeding	48%	49%	44%	55%
Breathing difficulty	44%	44%	40%	59%
Skin colour of baby	43%	43%	39%	51%
Alertness of baby	25%	26%	22%	22%
Eye swelling or discharge	15%	15%	14%	23%
What do you check for the mother during a postpartum visit?				
Average knowledge score (out of 100)	40	40	32	41
Percent providing specific response:				
Vaginal bleeding	86%	85%	86%	90%
Blood pressure	82%	84%	70%	85%
Signs of infection (fever)	64%	64%	58%	80%
Assess lochia (vaginal discharge)	54%	55%	41%	51%
Size and firmness of uterus	49%	53%	24%	41%
Breast engorgement	38%	40%	27%	31%
Signs of anaemia	34%	34%	31%	45%
Abdominal tenderness	28%	29%	23%	27%
Cough or breathing difficulties	11%	11%	11%	15%
Dribbling urine/urinary incontinence	11%	12%	5%	10%
Signs of depression	10%	11%	9%	12%
Deep vein thrombosis	8%	8%	4%	6%

Table 8.6.1A: Provider knowledge scores and percent of providers with knowledge of complications of abortion, how to intervene, and what to do for victims of sexual violence, by health worker cadre, Ethiopia EmONC, 2016

	Total n=3,792	Midwives n=3,193	Nurses n=456	HOs n=143
What are the immediate complications of unsafe abortion?				
Average knowledge score (out of 100)	51	51	47	60
Percent providing specific response:				
Bleeding	85%	85%	82%	92%
Sepsis	72%	72%	63%	83%
Shock	51%	51%	47%	63%
Genital injuries	29%	29%	28%	40%
Abdominal injuries	17%	17%	13%	24%
When you see a woman with complications from an unsafe or incomplete abortion, what do you do?				
Average knowledge score (out of 100)	46	46	40	52
Percent providing specific response:				
Begin IV fluids	82%	82%	77%	88%
Begin antibiotics	73%	74%	64%	85%
Perform (manual or electric) vacuum aspiration	51%	53%	31%	49%
Assess vital signs	50%	51%	39%	59%
Assess vaginal bleeding	46%	47%	43%	56%
Refer	46%	46%	54%	44%
Do a vaginal exam	39%	39%	36%	49%
Provide counselling	30%	31%	21%	41%
Give ergometrine or oxytocin or misoprostol	26%	26%	21%	29%
Perform evacuation with curettage	13%	13%	10%	22%
What information do you give clients who were treated for an unsafe or incomplete abortion?				
Average knowledge score (out of 100)	41	42	37	46
Percent providing specific response:				
Counselling on family planning and services	85%	87%	71%	87%
Refer for family planning to receive family planning methods	53%	55%	38%	59%
About when a woman can plan to conceive again	51%	52%	42%	53%
About the consequences of an unsafe abortion	47%	46%	48%	56%
How to prevent of reproductive tract infection/HIV	30%	29%	31%	38%
Social support	17%	17%	18%	19%
Refer for precancerous cervical lesion screening	7%	6%	11%	12%
When a woman presents as a victim of rape, what do you do?				
Average knowledge score (out of 100)	35	35	33	42
Percent providing specific response:				
Provide emergency contraception	67%	69%	57%	73%
Counsel for pre- and post-HIV testing	67%	67%	63%	76%
Counsel about pregnancy prevention	51%	52%	39%	58%
Provide post-exposure prophylaxis for HIV	25%	24%	23%	42%
Refer	22%	21%	29%	22%
Encourage her to report to police	20%	19%	23%	20%
Request urine, vaginal smear/swabs, and/or blood exams	19%	19%	16%	32%
Facilitate filling out the police report	13%	12%	16%	15%

Table 8.11.1A: Percent of providers mentioning specific measures for treating heavy bleeding after delivery and signs of newborn infection in 2008 and 2016, by health worker cadre, Ethiopia EmONC, 2016

	Total		Midwives		Nurses		Health officers	
	2008	2016	2008	2016	2008	2016	2008	2016
Number of providers interviewed	730	3,792	359	3,193	352	456	19	143
When a woman develops heavy bleeding after delivery, what do you do?								
Begin IV fluids	93%	91%	94%	92%	92%	86%	90%	92%
Give ergometrine or oxytocin (IV or IM) or misoprostol or tranexamic acid	66%	75%	73%	76%	63%	70%	58%	78%
Manually remove retained products	56%	62%	67%	65%	44%	42%	63%	62%
Examine woman for lacerations	40%	60%	48%	62%	32%	38%	37%	65%
Massage the fundus	33%	62%	42%	65%	24%	41%	37%	55%
Take blood for haemoglobin and cross-matching	15%	13%	19%	14%	11%	9%	16%	17%
What are the signs and symptoms of infection, or sepsis, in the newborn?								
Temperature ≥38° C (hyperthermia)		79%		79%		72%		92%
Temperature <35.5° C (hypothermia)		17%		16%		14%		34%
Hypothermia or hyperthermia	62%		64%		58%		90%	
Poor feeding on observation	61%	61%	61%	62%	60%	51%	56%	73%
Severe chest in-drawing/difficulty or fast breathing	46%	31%	47%	31%	45%	27%	53%	45%
Movement only with stimulation	35%	20%	36%	20%	35%	16%	26%	28%

Table 9.1.1A: Percent of facilities with a pharmacy or supply of medicines, and among those, percent of facilities with drug inventory, and source of drugs and supplies, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Facility has pharmacy/drug store	99%	100%	100%	100%	91%	99%	31%	62%
Facility has no pharmacy or store but has a supply of medicines	1%	0%	0%	0%	0%	1%	6%	0%
Number of facilities with either a pharmacy/drug store or a supply of medicines	n=3,780	n=30	n=103	n=159	n=21	n=3,453	n=6	n=8
Drug inventory register								
Exists	59%	87%	93%	87%	90%	56%	67%	63%
Among those that exist, up-to-date (observed)	75%	96%	91%	84%	74%	73%	100%	80%
Primary source of medicines for facility (multiple responses possible)								
Government	98%	97%	87%	96%	90%	99%	83%	63%
Private pharmacy	32%	70%	69%	50%	76%	30%	66%	88%
NGO/mission	17%	33%	22%	24%	38%	17%	33%	13%
Other	1%	3%	0%	1%	0%	1%	0%	0%
Primary source for gloves, syringes, and medical supplies (single source response)								
Government	97%	97%	75%	94%	67%	98%	67%	50%
Private pharmacy	2%	3%	19%	6%	29%	1%	33%	50%
NGO/mission	1%	0%	6%	1%	5%	1%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Table 9.1.4A: Percent of facilities with a pharmacy or supply of medicines that reported a stock out in the last 3 months, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,780	n=30	n=103	n=159	n=21	n=3,453	n=6	n=8
Gentamicin (injection)	47%	40%	25%	26%	33%	48%	50%	13%
Magnesium sulphate	53%	20%	28%	29%	57%	55%	33%	63%
Ketamine	57%	40%	26%	29%	52%	59%	33%	63%
Dexamethasone	50%	17%	10%	12%	38%	53%	33%	25%
Antiretrovirals	39%	10%	20%	28%	19%	41%	33%	25%
Oxytocin	17%	7%	17%	13%	33%	17%	17%	38%
Stock out of oxytocin due to interruption in the cold chain (among those with oxytocin stockout)	25%	0%	12%	19%	14%	26%	0%	33%

Table 9.1.5A: Percent of facilities with a pharmacy or supply of medicines that reported having safe oxygen supply and, of those, interruption in supply in labour and delivery, neonatal, or paediatric wards in the last 12 months, and if interruption was due to electrical supply, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,780	n=30	n=103	n=159	n=21	n=3,453	n=6	n=8
Labor and delivery ward								
Has safe supply of oxygen	18%	93%	98%	89%	95%	11%	50%	63%
Of those with oxygen, has had interruption	35%	18%	11%	27%	15%	47%	0%	0%
Neonatal ward								
Has safe supply of oxygen	15%	97%	93%	83%	86%	9%	50%	38%
Of those with oxygen, has had interruption	36%	21%	11%	28%	17%	51%	0%	0%
Pediatric ward								
Has safe supply of oxygen	13%	97%	90%	79%	86%	7%	33%	38%
Of those with oxygen, has had interruption	34%	21%	13%	30%	17%	49%	0%	0%
Among those with any interruption, interruption due to electricity supply	32%	33%	54%	46%	67%	27%	-	-

Table 9.2.1A: Percent of facilities that had drugs[1] related to the signal functions and emergencies, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Antibiotics (any)	99%	100%	100%	99%	91%	100%	31%	62%
Amoxicillin (oral)	96%	100%	99%	98%	91%	97%	31%	54%
Amoxicillin (injection)	4%	10%	10%	8%	4%	4%	6%	0%
Ampicillin (injection)	69%	83%	75%	90%	61%	68%	13%	31%
Augmentin	59%	93%	87%	91%	83%	57%	13%	54%
Cephazoline sodium	10%	20%	20%	17%	9%	10%	6%	8%
Cefixime	6%	23%	32%	18%	52%	4%	6%	31%
Ceftriaxone	82%	97%	95%	96%	91%	81%	25%	54%
Cefotaxime (injection, for newborn)	7%	50%	26%	14%	22%	5%	6%	8%
Clindamycin	13%	87%	72%	39%	30%	10%	6%	8%
Cloxacillin sodium	88%	100%	96%	96%	65%	89%	13%	38%
Erythromycin	79%	97%	80%	93%	52%	78%	6%	54%
Flucloxacillin (oral, for newborn)	9%	27%	17%	13%	26%	8%	0%	0%
Gentamicin (injection)	68%	80%	88%	89%	65%	67%	13%	46%
Metronidazole (injection)	32%	93%	84%	73%	70%	27%	13%	54%
Penicillin G (benzyl)	69%	93%	77%	88%	26%	68%	0%	38%
Procaine benzylpenicillin (procaine penicillin G)	74%	57%	46%	64%	22%	76%	13%	46%
Trimethoprim/sulfamethoxazole	79%	93%	94%	90%	74%	78%	19%	46%
Tetracycline eye ointment/drops	81%	97%	92%	86%	83%	80%	31%	62%
Anticonvulsants (any)	87%	100%	100%	98%	78%	86%	25%	46%
Magnesium sulphate - 50% concentration (injection)	48%	87%	74%	76%	52%	46%	19%	8%
Magnesium sulphate - concentration other than 50% (injection)	9%	10%	21%	14%	22%	8%	6%	0%
Diazepam (injection)	68%	97%	96%	95%	78%	66%	19%	38%
Phenobarbital (injection)	19%	33%	33%	27%	4%	18%	0%	8%
Phenytoin (diphenylhydantoin)	21%	83%	63%	61%	17%	17%	0%	8%
Antihypertensives (any)	92%	97%	100%	99%	87%	92%	25%	62%
Hydralazine	60%	87%	83%	89%	65%	58%	19%	54%
Labetalol	3%	30%	9%	8%	9%	2%	6%	0%
Methyldopa	74%	87%	84%	93%	70%	73%	6%	54%
Nifedipine	61%	87%	93%	86%	65%	59%	13%	46%
Oxytocics and prostaglandins (any)	94%	97%	98%	98%	91%	94%	31%	54%
Ergometrine	50%	77%	74%	68%	78%	49%	31%	31%
Methylergometrine	18%	60%	49%	32%	43%	16%	13%	15%
Misoprostol	43%	73%	72%	71%	87%	41%	25%	31%
Oxytocin	90%	90%	93%	95%	91%	90%	31%	54%
Prostaglandin E2 (dinoprostone)	3%	23%	18%	9%	35%	2%	0%	0%
Prostaglandin F2 alpha	1%	17%	7%	4%	13%	1%	0%	0%

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Drugs used in emergencies (any)	97%	100%	99%	99%	91%	97%	31%	62%
Adrenaline (epinephrine)	84%	97%	95%	96%	83%	83%	25%	62%
Aminophylline	44%	93%	80%	74%	52%	42%	0%	23%
Atropine	45%	100%	90%	88%	70%	40%	19%	23%
Calcium gluconate	24%	100%	77%	68%	57%	20%	6%	0%
Digoxin	16%	93%	79%	59%	26%	11%	6%	23%
Diphenhydramine	58%	93%	83%	80%	48%	57%	0%	31%
Ephedrine	39%	40%	50%	53%	22%	39%	0%	15%
Frusemide	73%	100%	95%	97%	74%	71%	13%	62%
Hydrocortisone	57%	67%	85%	86%	61%	55%	19%	62%
Naloxone	2%	23%	14%	6%	9%	2%	0%	8%
Nitroglycerine	6%	43%	22%	11%	9%	5%	0%	15%
Promethazine	68%	77%	85%	79%	35%	67%	6%	38%

[1] If facility reported neither a pharmacy nor a supply of medicines, that facility was assumed not to have the drug. Missing information was also taken as not having the drug.

Table 9.2.2A: Percent of facilities that have anaesthetics and other drugs[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Anaesthetics (any)	79%	100%	100%	99%	91%	78%	25%	54%
Halothane	7%	90%	87%	76%	52%	1%	13%	15%
Isoflurane	2%	43%	25%	9%	17%	0%	0%	0%
Enflurane	1%	13%	13%	3%	9%	0%	0%	0%
Ketamine	7%	83%	86%	72%	48%	1%	13%	15%
Lidocaine (2% or 1%)	72%	97%	92%	93%	87%	71%	25%	54%
Lidocaine (4%)	8%	17%	24%	16%	17%	7%	0%	15%
Bupivacaine (0.5%)	6%	80%	78%	61%	57%	0%	13%	0%
Propofol	6%	93%	76%	54%	39%	0%	13%	0%
Succinylcholine	4%	57%	46%	29%	39%	0%	13%	0%
Pancuroium	6%	90%	77%	61%	43%	0%	6%	8%
Analgesics (any)	97%	100%	100%	99%	91%	97%	31%	62%
Acetylsalicylic acid	75%	97%	88%	88%	48%	74%	6%	31%
Indomethacin	79%	97%	91%	94%	52%	79%	6%	62%
Morphine	6%	63%	40%	24%	4%	3%	6%	15%
Paracetamol (tab)	95%	100%	98%	99%	91%	95%	31%	62%
Paracetamol (suppository)	89%	97%	93%	95%	91%	89%	13%	46%
Pethidine	13%	93%	89%	79%	65%	7%	19%	23%
Diclofenac	93%	100%	100%	99%	91%	93%	31%	62%
Tramadol	61%	93%	91%	96%	91%	58%	19%	54%
Steroids (any)	83%	100%	100%	99%	83%	82%	19%	62%
Betamethasone	13%	43%	59%	41%	13%	10%	0%	8%
Dexamethasone	47%	97%	93%	93%	61%	44%	13%	54%
Prednisone	42%	60%	70%	70%	61%	40%	0%	23%
Prednisolone corticosteroid	34%	80%	57%	55%	43%	32%	0%	38%
IV fluids (any)	98%	100%	100%	99%	91%	99%	31%	62%
Dextrose (5% with normal saline)	74%	93%	95%	95%	74%	73%	25%	54%
Dextran	12%	20%	32%	20%	26%	11%	13%	23%
Dextrose (5% in water)	67%	100%	94%	87%	83%	66%	25%	54%
Glucose (10%)	5%	10%	9%	6%	9%	5%	13%	8%
Glucose (40% or 50%)	87%	97%	92%	97%	91%	88%	31%	62%
Normal saline	89%	93%	95%	92%	91%	89%	31%	54%
Ringer's lactate	87%	97%	97%	95%	91%	87%	31%	54%
Antimalarials (any)	88%	87%	94%	95%	26%	88%	6%	38%
Chloroquine	74%	60%	71%	83%	17%	75%	6%	31%
ACT	58%	60%	74%	71%	4%	58%	0%	23%
Quinine dihydrochloride	53%	60%	72%	81%	9%	52%	0%	31%
Antiretrovirals (any)	54%	100%	96%	88%	91%	50%	13%	23%
Post-HIV exposure prophylactic treatment	36%	100%	93%	77%	61%	32%	6%	23%
Option B+ regimen (for mother)	44%	100%	94%	78%	87%	41%	13%	23%
Option B+ regimen (for newborn)	44%	100%	89%	76%	87%	41%	13%	23%

ACT = artemisinin-based combination therapy.

[1] If facility reported neither a pharmacy nor a supply of medicines, that facility was assumed not to have the drug. Missing information was also taken as not having the drug.

Table 9.4.1A: Percent of facilities that have the indicated guidelines in the maternity area[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Guidelines, protocols, or job aids								
Safe abortion technical guideline	36%	70%	60%	64%	70%	34%	75%	23%
PMTCT	65%	93%	92%	82%	91%	63%	81%	54%
Management protocol on selected obstetric topics (for health centres, for hospitals)	52%	87%	74%	68%	65%	51%	69%	38%
Infection prevention guideline	52%	90%	83%	69%	74%	49%	75%	62%
Reimbursement protocol	9%	33%	22%	13%	17%	9%	19%	8%
Integrated management for pregnancy, childbirth, postpartum, and newborn care (focus on routine care)	57%	73%	77%	62%	78%	56%	63%	31%
Care for preterm or for low birth weight babies, including KMC	48%	70%	67%	56%	65%	46%	50%	38%
Neonatal resuscitation	65%	90%	83%	66%	70%	64%	50%	54%
Treatment for infection in young infants (IMNCI)	72%	80%	66%	69%	57%	73%	44%	23%
Referral and counter-referral	26%	57%	47%	38%	39%	24%	38%	23%
Infection prevention for HIV/AIDS (universal precautions)	41%	73%	81%	54%	65%	38%	63%	38%
Family planning	78%	90%	83%	75%	87%	78%	94%	46%

IMNCI = integrated management of neonatal and childhood illness; KMC = kangaroo mother care; PMTCT = prevention of mother-to-child transmission (of HIV).

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to maternity and these questions were therefore related to whether the facility, in general, had the items available.

Table 9.4.2A: Percent of facilities with basic equipment and supplies in the maternity area[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Equipment								
Filled O_2 cylinder, carrier, and key	36%	93%	92%	88%	91%	31%	75%	69%
Ultrasound	8%	100%	95%	63%	100%	1%	94%	85%
Cardiotocography (external or internal)	3%	60%	50%	10%	61%	0%	13%	15%
Blood pressure cuff	94%	97%	98%	99%	100%	94%	100%	100%
Stethoscope (for adult)	98%	100%	100%	99%	100%	98%	100%	92%
Stethoscope (for foetus)	92%	100%	100%	96%	100%	92%	100%	100%
Doppler	15%	67%	69%	31%	87%	11%	88%	62%
Thermometer (clinical)	92%	100%	100%	98%	100%	91%	100%	100%
Thermometer (low reading)	24%	43%	49%	37%	57%	22%	38%	23%
Supplies								
Kidney basins	85%	93%	96%	93%	96%	84%	94%	100%
Sponge bowls	71%	87%	89%	87%	100%	69%	100%	100%
Scissors	99%	100%	99%	99%	100%	99%	100%	100%
Needles and syringes (10-20cc)	87%	100%	100%	97%	100%	86%	100%	92%
Syringes (1, 2, 5, 10, 15ml)	98%	100%	99%	100%	100%	98%	100%	100%
Needles (23-25 gauge)	58%	93%	80%	71%	91%	56%	63%	62%
Suture needles/suture materials	97%	100%	96%	98%	100%	97%	88%	100%
Catheter for IV line (16-18)	96%	100%	100%	99%	100%	95%	100%	100%
IV infusion stand(s)	98%	100%	100%	99%	100%	97%	100%	100%
Urinary catheters	91%	100%	100%	99%	96%	90%	94%	100%
IV cannulae (24 gauge)	81%	97%	99%	95%	96%	79%	88%	100%
Dipstick for urinalysis	55%	77%	83%	82%	100%	53%	88%	92%
Ventilator bag and mask (for adult)	65%	97%	94%	85%	83%	63%	94%	92%
Dressing forceps	92%	93%	98%	94%	96%	92%	100%	100%
Partograph form	83%	93%	93%	94%	87%	82%	75%	62%
Watch or clock with second hand that can be easily seen	37%	90%	83%	62%	96%	33%	81%	62%
Measuring tape	77%	93%	90%	86%	91%	76%	88%	92%
Obstetric wheel	22%	50%	56%	33%	61%	19%	63%	38%
Tubing for oxygen administration	15%	100%	92%	81%	91%	8%	81%	62%
Pulse oximeter	12%	90%	76%	68%	78%	6%	75%	62%
Apnoea monitor	4%	47%	35%	18%	35%	2%	13%	15%
HIV rapid test kit	75%	87%	83%	75%	74%	75%	75%	69%

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

Table 9.4.5A: Percent of facilities with sets for delivery, episiotomy/perineal repair, and cervical exploration/repair, and mean number of complete sets in the maternity area[1], by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Delivery set/pack								
Facility has at least one complete set/pack	98%	97%	100%	100%	100%	98%	100%	100%
Mean number of complete sets/packs	5	15	8	8	13	5	5	7
Episiotomy and perineal repair set								
Facility has at least one complete set	80%	87%	95%	88%	100%	79%	94%	85%
Mean number of complete sets	3	10	5	6	11	3	3	3
Cervical exploration and repair set								
Facility has at least one complete set	12%	73%	74%	49%	70%	7%	50%	31%
Mean number of complete sets	3	4	3	3	17	3	2	2

[1] For hospitals, the maternity area was likely to be a specific room and these questions were related to the items available in that specific room. Health centres may not have had a specific room devoted to a maternity and these questions were therefore related to whether the facility, in general, had the items available.

Table 9.5.1A: Percent of facilities with equipment and supplies for newborn care, by facility type, Ethiopia EmONC, 2016

	Total	Referral/ specialized hospitals	General hospitals	Primary hospitals	MCH specialty centres	Health centres	MCH specialty clinics	Higher clinics
	n=3,804	n=30	n=103	n=160	n=23	n=3,459	n=16	n=13
Basic newborn care								
Baby weighing scale	98%	100%	100%	99%	100%	98%	100%	100%
Cord ties/clips	95%	93%	91%	96%	100%	95%	100%	100%
Thermometer for newborn	55%	90%	84%	65%	91%	53%	56%	77%
Caps or hats to prevent heat loss	23%	50%	48%	32%	61%	21%	31%	31%
Towels/blankets or cloth for newborn	29%	70%	76%	49%	87%	26%	69%	54%
Newborn resuscitation								
Neonatal resuscitating table	81%	90%	95%	89%	96%	80%	88%	85%
Mucus extractor/simple suction	89%	93%	99%	95%	91%	88%	100%	100%
Neonatal face masks (size 0)	74%	90%	83%	88%	78%	73%	75%	77%
Neonatal face masks (size 1)	74%	90%	84%	88%	78%	73%	63%	69%
Neonatal size ambu (ventilatory bag)	94%	97%	99%	99%	96%	94%	88%	100%
Suction catheter (10, 12Ch)	32%	87%	82%	68%	96%	28%	75%	62%
Infant laryngoscope with spare bulb and batteries	7%	77%	54%	38%	52%	3%	50%	15%
Endotracheal tubes (3.5, 3.0, 2.5mm)	7%	80%	61%	43%	61%	3%	38%	0%
Disposable uncuffed tracheal tubes (sizes 2.0-3.5)	5%	63%	52%	34%	35%	2%	25%	8%
Suction apparatus (foot- or electrically-operated)	21%	90%	85%	75%	78%	15%	63%	31%
Mucus trap for suction	49%	87%	83%	79%	83%	45%	88%	54%
Newborn anatomical model (for practice)	11%	57%	45%	21%	26%	9%	6%	15%
Equipment for resuscitation accessible within the delivery unit	90%	100%	98%	94%	100%	90%	94%	92%
Decontamination supplies for bag and mask	88%	100%	100%	97%	100%	87%	88%	77%
Small and sick newborns								
Register for sick babies	43%	87%	60%	54%	52%	41%	13%	38%
Daily patient chart	53%	80%	80%	81%	91%	51%	69%	54%
IV fluid (neonatal giving) set	36%	90%	86%	73%	83%	32%	69%	54%
Exchange transfusion set	7%	63%	58%	33%	43%	3%	13%	23%
Umbilical catheter	8%	47%	39%	23%	26%	6%	38%	15%
Syringes (0.5, 1.0ml)	86%	80%	87%	86%	96%	86%	88%	69%
Radiant warmer	37%	97%	91%	88%	83%	33%	50%	31%
Incubator	11%	93%	78%	52%	48%	6%	25%	0%
Designated space or beds for KMC	17%	67%	49%	38%	17%	14%	13%	8%
KMC register	15%	37%	36%	28%	13%	13%	6%	8%
Nasogastric feeding tube (#4)	22%	83%	84%	70%	78%	16%	69%	38%
Cup and spoon for infant feeding	36%	80%	63%	55%	61%	34%	56%	31%
Cup for breast milk expression	33%	70%	61%	56%	61%	31%	50%	23%
Icterometer	3%	43%	26%	11%	22%	1%	13%	0%
Fluorescent tubes for phototherapy to treat jaundice	5%	70%	57%	28%	39%	1%	13%	0%
Oxygen source	15%	97%	90%	88%	96%	8%	63%	69%
Laryngoscope (newborn size)	5%	77%	53%	38%	48%	1%	31%	15%
Respirator for neonates	10%	67%	50%	36%	39%	7%	38%	8%
CPAP machine	3%	60%	35%	23%	17%	0%	13%	0%
Chlorhexidine gel (4%)[1]	11%	17%	26%	14%	22%	11%	6%	8%

CPAP = continuous positive airway pressure; KMC = kangaroo mother care.

[1] Differences in the percent of facilities with chlorhexidine gel (4%) between this table and Table 9.3.1 may be due to different physical areas under scrutiny.

Table 10.1.1A: Number of facilities where partographs were reviewed and how many were reviewed, by region, facility type, managing authority, and EmONC classification, Ethiopia EmONC, 2016

	Number of facilities	Percent of facilities where partographs were reviewed	Number of facilities where partographs were reviewed and how many were reviewed[1]		Total number of partographs reviewed
			1	2	
National	3,804	71%	162	2,545	5,252
Region					
Tigray	255	93%	12	225	462
Afar	77	35%	2	25	52
Amhara	876	88%	25	744	1,513
Oromia	1,405	62%	79	790	1,659
Somali	161	26%	5	37	79
Benishangul-Gumuz	43	42%	11	7	25
SNNP	773	77%	23	571	1,165
Gambella	27	15%	1	3	7
Harari	15	80%	0	12	24
Addis Ababa	151	78%	5	113	231
Dire Dawa	21	81%	0	17	35
Facility type					
Referral/specialized hospitals	30	87%	0	26	52
General hospitals	103	72%	1	73	147
Primary hospitals	160	89%	8	134	276
MCH specialty centres	23	57%	1	12	25
Health centres	3,459	71%	152	2,290	4,732
MCH specialty clinics	16	44%	0	7	14
Higher clinics	13	23%	0	3	6
Managing authority					
Public/government	3,662	72%	157	2,476	5,109
Private-for-profit	83	34%	2	26	54
Private-not-for-profit[2]	59	78%	3	43	89
EmONC classification					
CEmONC	148	91%	0	135	269
BEmONC	222	86%	9	182	373
Partially functioning[3]	3,395	70%	153	2,215	4,583
Non-EmONC[4]	39	36%	1	13	27

[1] Maximum number of partographs reviewed was 2 per facility.

[2] Includes NGO, faith-based, or mission facilities.

[3] Partially functioning indicates facilities missing at least one BEmONC signal function but provides at least one.

[4] Non-EmONC indicates those facilities providing no EmONC signal functions.

Table 10.1.5A: Percent distribution of partographs reviewed according to charting of delivery time, by mode of delivery, reason for instrumental or caesarean delivery, and newborn outcome, Ethiopia EmONC, 2016

		Charting of delivery time[2]				
	Number of partographs reviewed[1]	On or left of alert line	Between alert and action lines	On or right of action line	No information	Total
Total cases[1]	4,827	77%	15%	2%	6%	100%
Mode of delivery						
Vaginal	4,570	78%	15%	2%	5%	100%
Instrumental	30	57%	23%	20%	0%	100%
Caesarean	17	47%	18%	24%	12%	100%
No information	210	48%	12%	5%	35%	100%
Reason for instrumental or caesarean delivery						
Prolonged first stage of labour	8	[13%]	[25%]	[50%]	[13%]	[100%]
Prolonged second stage of labour	12	[50%]	[25%]	[25%]	[0%]	[100%]
Suspicion of or immediate foetal distress	8	[75%]	[13%]	[0%]	[13%]	[100%]
Other	7	[43%]	[43%]	[14%]	[0%]	[100%]
No information	12	[75%]	[8%]	[17%]	[0%]	[100%]
Newborn outcome						
Normal live birth	4,410	78%	15%	2%	5%	100%
Live birth with asphyxia	33	73%	18%	6%	3%	100%
Stillbirth	36	64%	17%	8%	11%	100%
No information	348	58%	13%	3%	25%	100%

[1] This table is based only on those partographs where first dilatation was charted correctly on the alert line (n=4,838), minus 11 cases that did not indicate timing of delivery.

[2] Figures in brackets indicate that analyses are based on very few cases.

Table 10.2.2A: Percent distribution of caesarean deliveries reviewed according to maternal characteristics, by managing authority, Ethiopia EmONC, 2016

	All caesareans reviewed	Managing authority		
		Public/ government	Private-for-profit	Private-not-for-profit[1]
	n=568	n=409	n=127	n=32
Age (in years)				
<18	1%	1%	0%	6%
18-24	33%	38%	20%	28%
25-29	38%	33%	54%	41%
30-34	17%	16%	17%	22%
35-39	9%	9%	9%	3%
≥40	2%	2%	1%	0%
Mean age (in years)	26	26	28	25
Parity (index pregnancy)				
Nulliparous (0 parity, 1st delivery)	41%	46%	25%	28%
Parity 1	21%	17%	30%	31%
Multiparous (2-4 parity)	24%	24%	20%	28%
Grand multiparous (≥5 parity)	7%	9%	2%	3%
No information	8%	3%	22%	9%
Gestational age				
Preterm (<37 weeks)	9%	10%	8%	9%
Term (37-42 weeks)	71%	73%	67%	72%
Post-term (>42 weeks)	6%	7%	6%	3%
No information	13%	11%	19%	16%
HIV status				
Positive	2%	2%	3%	3%
Negative	65%	63%	73%	63%
Unknown	32%	35%	24%	34%

[1] Includes NGO, faith-based, or mission facilities.

Table 10.2.4A: Percent distribution of caesarean deliveries reviewed according to indication, by managing authority, Ethiopia EmONC, 2016

	All caesareans reviewed		Managing authority		
			Public/ government	Private-for-profit	Private-not-for-profit[1]
	n	%	n=409	n=127	n=32
Indication for caesarean delivery					
Cephalo-pelvic disproportion	82	14%	16%	10%	13%
Foetal distress (persistent bradycardia, tachycardia, NRFHR)	72	13%	13%	10%	13%
Previous caesarean/uterine scar	71	13%	8%	26%	22%
Malpresentation, abnormal lies, and breech	54	10%	11%	5%	6%
Obstructed labour	40	7%	7%	6%	9%
Prolonged latent first stage	33	6%	7%	4%	3%
Prolonged/delayed second stage	32	6%	7%	1%	9%
Arrest disorder (of dilation or descent)/failure to progress	32	6%	6%	4%	3%
Uncontrolled severe pre-eclampsia/eclampsia	21	4%	4%	2%	6%
Placenta praevia	19	3%	3%	3%	3%
Placenta abruption	16	3%	4%	1%	0%
Failed induction	18	3%	2%	6%	3%
Multiple gestation	10	2%	2%	2%	0%
Cord prolapse	10	2%	2%	2%	3%
Failed vacuum extraction or forceps	6	1%	1%	1%	0%
Maternal request	5	1%	0%	4%	0%
Meconium stained amniotic fluid in early stage of labour	4	1%	1%	0%	0%
Failed trial of scar/failed VBAC	2	0%	1%	0%	0%
Other[2]	18	3%	2%	6%	6%
No information	23	4%	3%	9%	0%
Total	568	100%	100%	100%	100%

NRFHR = non-reassuring foetal heart rate pattern; VBAC = vaginal birth after caesarean.

[1] Includes NGO, faith-based, or mission facilities.

[2] Other includes 2 cases of intrauterine growth retardation, 2 cases of prevention of mother-to-child transmission of HIV, 1 case of vesico-vaginal fistula, 1 case of maternal medical disease, 4 post-term cases, 2 preterm cases, 2 cases of uterine rupture, 1 case of intrauterine foetal death, 1 case of premature rupture of membranes, 1 case of trauma, and 1 case of non-reassuring biophysical state.

Table 10.2.6A: Percent distribution of caesarean deliveries reviewed according to duration of hospital stay, mean number of days in hospital, and whether the time between decision and surgery was recorded, by referral status and type of caesarean, Ethiopia EmONC, 2016

	All caesareans reviewed	Not referred/no information[1]			Referred[1]		
		Emergency	Elective	No information	Emergency	Elective	No information
	n=566	n=299	n=57	n=28	n=165	n=10	n=7
Duration of hospital stay (in days)							
0-2.99	10%	10%	23%	14%	6%	10%	0%
3.00-8.99	54%	53%	44%	29%	63%	60%	57%
9.00-12.99	2%	2%	0%	4%	3%	10%	14%
≥13	1%	1%	0%	0%	2%	0%	0%
No information	33%	34%	33%	54%	27%	20%	29%
Mean number of days in hospital	4.4	4.9	3.6	4.2	5.2	5.0	6.2
Mean number of days in hospital by indication for caesarean delivery							
CPD/prolonged labour[2] (n=192)	4.5	4.4	3.5	4.8	4.7	5.0	5.0
Previous caesarean/uterine scar (n=44)	3.1	3.3	2.9	2.5	3.4	2.0	
Placenta praevia/abruption (n=26)	4.2	4.9	4.0	4.0	3.5		4.0
Foetal distress[3] (n=57)	4.3	4.3	2.3		4.6	3.7	
Record of time interval between decision to operate and surgery[4]	n=423	n=270			n=153		
Time recorded	34%	29%			44%		
Time not recorded/no information	66%	71%			56%		

CPD = cephalo-pelvic disproportion; PE/E = pre-eclampsia/eclampsia.

[1] Shaded cells mean that question was not administered due to skip pattern, or no cases fit the selection.

[2] CPD/prolonged labour includes CPD, malpresentations, prolonged 1st and 2nd stages of labour, arrest disorders, failure to progress, failed assisted vaginal delivery, failed induction, and uterine ruptures.

[3] Foetal distress includes distress, severe intrauterine growth restriction, and non-reassuring biophysical state.

[4] Time lapse from decision to surgery was asked only of emergency caesareans.

Table 10.2.8A: Percent distribution of caesarean deliveries reviewed according to cadre performing surgery, providing anaesthesia, and type of anaesthesia used, by managing authority, Ethiopia EmONC, 2016

	All caesareans reviewed	Managing authority		
		Public/ government	Private-for-profit	Private-not-for-profit[1]
	n=568	n=409	n=127	n=32
Clinician who performed the surgery				
Obstetrician/gynaecologist	41%	25%	88%	69%
General surgeon	31%	39%	7%	25%
Integrated emergency surgical officer	21%	29%	0%	3%
Health officer	3%	4%	0%	0%
MD (general practitioner)	1%	2%	0%	3%
Other	1%	1%	0%	0%
No information	2%	1%	5%	0%
Clinician who provided the anaesthesia				
Nurse anaesthetist	91%	91%	90%	97%
Anaesthesiologist (MD)	4%	3%	8%	3%
Other trained health workers	3%	4%	0%	0%
Same person as did the surgery	1%	1%	0%	0%
No information	2%	2%	2%	0%
Type of anaesthesia used				
Spinal	59%	60%	49%	81%
General (not ketamine)	28%	26%	36%	9%
Ketamine only	4%	5%	2%	6%
Epidural	0%	0%	0%	0%
No information	9%	8%	14%	3%

[1] Includes NGO, faith-based, or mission facilities.

Table 10.2.9A: Percent of caesarean deliveries reviewed according to source documents, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	All caesareans reviewed	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=568	n=519	n=49	n=409	n=127	n=32
Source documents						
Preoperative decision note	77%	79%	59%	81%	67%	69%
Operation note	91%	92%	76%	93%	87%	84%
Anaesthesia sheet	79%	80%	65%	80%	72%	88%
Recovery follow-up sheet	59%	59%	53%	64%	43%	50%
Progress note	77%	79%	61%	80%	75%	59%
Discharge report/death summary	47%	50%	14%	51%	38%	44%
Safe surgical check list	20%	21%	16%	23%	9%	28%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 10.3.2A: Percent distribution of reviewed maternal deaths (excluding cases with no information) according to cause of death, by facility type and managing authority, Ethiopia EmONC, 2016

	All maternal deaths reviewed	Facility type		Managing authority		
		Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=330	n=205	n=125	n=313	n=5	n=12
Direct causes	**86%**	**85%**	**87%**	**86%**	**100%**	**75%**
PPH	29%	22%	42%	29%	40%	25%
Severe PE/E	18%	24%	9%	19%	20%	8%
APH	8%	7%	10%	8%	0%	8%
Obstructed/prolonged labour	6%	3%	10%	6%	0%	0%
Retained placenta	5%	2%	9%	5%	0%	0%
Ruptured uterus	5%	7%	0%	4%	0%	17%
Postpartum sepsis	5%	5%	3%	4%	40%	0%
Severe complications of abortion	2%	3%	1%	2%	0%	0%
Ectopic pregnancy	1%	0%	1%	1%	0%	0%
Other direct causes	7%	10%	3%	7%	0%	17%
Indirect causes	**12%**	**13%**	**10%**	**12%**	**0%**	**25%**
Anaemia	3%	2%	5%	4%	0%	0%
HIV/AIDS	1%	0%	1%	1%	0%	0%
Other indirect causes	8%	11%	4%	8%	0%	25%
Unknown causes (information not missing; cause was reported as unknown)	**2%**	**1%**	**3%**	**2%**	**0%**	**0%**
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

APH = antepartum haemorrhage; PE/E = pre-eclampsia/eclampsia; PPH = postpartum haemorrhage.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 10.3.3A: Percent distribution of reviewed maternal deaths according to age, gestation, newborn outcome and cause of ndeath, AND percent distribution of reviewed maternal deaths according to cause of death, by age, gestation, and newborn outcomes, Ethiopia EmONC, 2016

	All maternal deaths reviewed		Cause of death			
	n	% distribution	Direct causes n=284	Indirect causes n=40	Unknown/no information n=285	Total n=609
Age						
<18	10	2%	30%	0%	70%	100%
18-24	175	29%	44%	6%	50%	100%
25-29	195	32%	48%	11%	42%	100%
30-34	117	19%	49%	4%	47%	100%
35-39	69	11%	48%	4%	48%	100%
≥40	20	3%	65%	5%	30%	100%
No information	23	4%	35%	0%	65%	100%
Total	609	100%				
Mean age (years)	586	27				
Gestation						
1st trimester (<16 wks)	8	1%	38%	0%	63%	100%
2nd trimester (16-27 wks)	9	1%	44%	33%	22%	100%
3rd trimester (≥28 wks)	172	28%	70%	12%	18%	100%
No information	420	69%	37%	4%	59%	100%
Total	609	100%				
Newborn outcome[1]						
Live birth	144	26%	56%	11%	33%	100%
Stillbirth	250	46%	40%	4%	56%	100%
Early neonatal death	29	5%	34%	3%	62%	100%
Multiple gestation (live birth + death)	5	1%	60%	0%	40%	100%
No information	119	22%	45%	3%	52%	100%
Total	547	100%				
Cause of newborn death						
Asphyxia	8	24%	38%	0%	63%	100%
Prematurity-related	7	21%	71%	0%	29%	100%
Infection/pneumonia	1	3%	100%	0%	0%	100%
Congenital anomalies	1	3%	0%	0%	100%	100%
Obstetric trauma	1	3%	0%	0%	100%	100%
No information	16	47%	25%	6%	69%	100%
Total	34	100%				

[1] Analysed among women who were known to have delivered.

Table 10.3.6A: Mean number of maternity beds and percent of facilities with selected characteristics among facilities with no reported maternal deaths and among those where maternal deaths were reviewed, Ethiopia EmONC, 2016

	Facilities with no reported maternal deaths n=3,332	Facilities where maternal deaths were reviewed n=423
Mean number of maternity beds	9	18
Percent of facilities with:		
Any source of electricity	88%	92%
Water source on-site/within compound	59%	69%
At least one form of communication (telephone/radio)	34%	52%
Functional motorized ambulance	13%	28%
Incinerator	83%	84%
Operating theatre	5%	32%
Laboratory	79%	84%
Blood units available for transfusion	3%	23%

Table 10.4.1A: Percent distribution of facilities where cases of maternal morbidities were reviewed according to facility type, managing authority, location, and EmONC classification, by morbidity type, Ethiopia EmONC, 2016

	Postpartum haemorrhage n=936	Severe pre-eclampsia/ eclampsia n=607	Sepsis n=252
Number of morbidities reviewed at facility			
1	375	255	120
2	561	352	132
Total number of reviewed cases	1,497	959	384
Facility type			
Hospitals/MCH specialty centres	23%	37%	53%
Health centres/clinics[1]	77%	63%	47%
Managing authority			
Public/government	95%	91%	94%
Private-for-profit	2%	6%	4%
Private-not-for-profit[2]	2%	4%	3%
Location			
Urban	56%	62%	69%
Rural	44%	38%	31%
EmONC classification			
CEmONC	14%	23%	37%
BEmONC	10%	10%	9%
Partially functioning[3]	75%	67%	54%
Non-EmONC[4]	0%	0%	0%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Partially functioning indicates those facilities providing some signal functions but missing at least one BEmONC signal function.

[4] Non-EmONC indicates those facilities providing no EmONC signal functions.

Table 10.4.4A: Percent of reviewed postpartum haemorrhage cases according to treatment and newborn outcomes, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	All PPH cases	Hospitals/ MCH specialty centres	Health centres/ clinics[1]	Public/ government	Private-for-profit	Private-not-for-profit[2]
	n=1,497	n=390	n=1,107	n=1,428	n=34	n=35
Treatment (% recorded yes)						
Uterotonic provided - IM, IV, or both (% distribution)						
None given/no information	44%	27%	50%	45%	18%	37%
Oxytocin	45%	54%	41%	45%	38%	46%
Ergometrine	3%	6%	2%	3%	24%	6%
Misoprostol	1%	2%	1%	1%	0%	0%
Both ergometrine and oxytocin	7%	12%	5%	7%	21%	11%
IV set up and fluids given	55%	84%	44%	54%	97%	63%
Haemoglobin or haematocrit assessed	33%	73%	19%	32%	82%	43%
Manual removal of placenta performed	17%	33%	12%	17%	38%	20%
Cross-matching done	17%	53%	4%	14%	79%	46%
Fluid intake/output chart documented	10%	24%	6%	9%	50%	26%
Bimanual compression performed	9%	16%	7%	9%	18%	23%
Blood transfusion performed	7%	26%	0%	6%	56%	26%
Non-pneumatic anti-shock garment used	3%	6%	3%	4%	0%	0%
Uterine curettage performed	2%	5%	1%	2%	6%	3%
Laparotomy performed	2%	7%	0%	1%	18%	6%
Uterine balloon tamponade used	1%	3%	0%	1%	9%	0%
Newborn outcomes (% distribution)						
Alive at discharge	76%	74%	77%	76%	91%	83%
Stillbirth	5%	5%	5%	5%	0%	3%
Early neonatal death	1%	1%	0%	1%	0%	0%
Multiple gestation (live birth + stillbirth)	0%	1%	0%	0%	0%	0%
No information	18%	19%	18%	18%	9%	14%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 10.5.3A: Percent distribution of cases of newborn breathing difficulties according to client status at birth/admission, treatment, and outcome, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	All cases	Hospitals/MCH specialty centres	Health centres/clinics [1]	Public/ government	Private for-profit	Private-not-for-profit[2]
	n=2,433	n=396	n=2,037	n=2,343	n=55	n=35
Client status at birth/admission						
Duration of labour						
Precipitated labour (<1 hour)	0%	1%	0%	0%	0%	0%
Normal labour (1-12 hours)	22%	24%	21%	22%	18%	23%
Prolonged labour (>12 hours)	3%	10%	2%	3%	11%	9%
No information	75%	65%	77%	75%	71%	69%
Mode of delivery						
Vaginal	88%	66%	92%	89%	47%	63%
Instrumental	3%	8%	2%	3%	4%	11%
Caesarean	3%	18%	0%	2%	47%	11%
No information	7%	8%	6%	7%	2%	14%
Mother experienced obstetric complication[3] (% yes)	6%	18%	3%	5%	16%	9%
Treatment						
Type of resuscitation used						
Stimulation	1%	1%	1%	1%	0%	0%
Bag and mask	26%	23%	27%	27%	27%	11%
Both stimulation and bag and mask	12%	22%	10%	12%	7%	26%
Intubation	1%	6%	0%	1%	5%	3%
No information/none	59%	47%	62%	59%	60%	60%
Oxygen given as needed (% yes)	18%	50%	12%	18%	42%	29%
Outcome						
Alive at discharge	46%	61%	43%	46%	55%	54%
Dead	44%	28%	47%	44%	40%	40%
No information/unknown	10%	11%	10%	10%	5%	6%

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Includes obstructed/prolonged labour (60%), pre-eclampsia/eclampsia (20%), haemorrhage (14%), and other obstetric complications (6%). Does not include 2 cases of reported abortion and 4 stillbirths.

Table 10.5.4A: Percent distribution of cases of preterm and low birth weight babies according to client status at birth/admission, treatment, and outcome, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	All cases	Hospitals/MCH specialty centres	Health centres/clinics[1]	Public/ government	Private for-profit	Private-not-for-profit[2]
	n=1,144	n=345	n=799	n=1,075	n=45	n=24
Client status at birth/admission						
Location of delivery						
Home	4%	6%	3%	4%	4%	0%
Health facility	94%	92%	95%	94%	96%	100%
No information	2%	2%	2%	2%	0%	0%
Mother received antenatal corticosteroids (% yes)	5%	12%	2%	4%	22%	4%
Breastfeeding status						
Breastfed well	20%	14%	23%	20%	9%	21%
Breastfed but having difficulty	19%	22%	17%	19%	18%	13%
Was not breastfed	18%	29%	14%	18%	13%	21%
No information	43%	34%	47%	42%	60%	46%
Treatment						
Received incubator service (% yes)	16%	47%	3%	15%	31%	8%
Initiated KMC (% yes)	46%	43%	47%	48%	18%	17%
Daily monitoring chart found in file (% yes)	19%	55%	3%	18%	47%	25%
Feeding plan described/mother counselled (% yes)	37%	53%	29%	36%	44%	33%
Outcome						
Alive at discharge	67%	70%	66%	67%	78%	88%
Dead	13%	16%	12%	13%	11%	8%
No information/unknown	19%	14%	22%	20%	11%	4%

KMC = kangaroo mother care.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

Table 10.5.5A: Percent distribution of cases of newborn/young infant infections according to client status at birth/admission, treatment, and outcome, by facility type and managing authority, Ethiopia EmONC, 2016

		Facility type		Managing authority		
	All cases	Hospitals/MCH specialty centres	Health centres/clinics[1]	Public/ government	Private for-profit	Private-not-for-profit[2]
	n=2,258	n=366	n=1,892	n=2,209	n=27	n=22
Client status at birth/admission						
Location of delivery						
Home	2%	6%	1%	2%	4%	0%
Health facility	30%	68%	23%	29%	70%	59%
No information	68%	26%	76%	69%	26%	41%
Mother/baby/young infant[3] was referred from other facility (% yes)	4%	20%	1%	4%	15%	9%
Admission/consultation						
OPD	86%	29%	97%	87%	30%	55%
In-patient	12%	62%	2%	11%	56%	45%
Both OPD and in-patient	2%	8%	1%	2%	15%	0%
Median age of babies/young infants[3] (in days)	21	3	23	21	10	5
Record-keeping						
Weight recorded (% yes)	78%	78%	78%	78%	93%	68%
Temperature recorded (% yes)	100%	100%	100%	100%	100%	100%
Heart rate recorded (% yes)	13%	56%	4%	12%	48%	27%
Respiratory rate recorded (% yes)	61%	77%	58%	61%	63%	55%
Oxygen saturation level recorded (% yes)	37%	38%	37%	38%	22%	18%
Treatment						
Antibiotics given[4] (% yes)	46%	83%	39%	45%	70%	73%
Follow-up plan described/mother counselled (% yes)	66%	64%	66%	66%	59%	36%
Outcome						
Alive at discharge	81%	81%	81%	81%	89%	77%
Dead	1%	4%	1%	1%	0%	5%
No information/unknown	18%	15%	19%	18%	11%	18%

OPD = out-patient department.

[1] Includes MCH specialty clinics and higher clinics.

[2] Includes NGO, faith-based, or mission facilities.

[3] Young infant refers to age less than 60 days.

[4] For OPD: ampicillin and gentamicin. For in-patient: injectable antibiotics. For this analysis the two groups (in-patient and outpatient) could not be separated.

Table 11.1.2A: Percent distribution of facilities according to distance to nearest facility that provided obstetric surgery, by facility type, region, and location, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres						Health centres/clinics[1]					
	Number of facilities that provided surgery in the last 3 months	Number of facilities that did not provide surgery in the last 3 months[2]	Among facilities that did not provide surgery, distance to nearest facility that provided surgery in the last 3 months				Number of facilities that provided surgery in the last 3 months	Number of facilities that did not provide surgery in the last 3 months[2]	Among facilities that did not provide surgery, distance to nearest facility that provided surgery in the last 3 months			
			≤25 kms	26-50 kms	>50 kms	Don't know/ missing			≤25 kms	26-50 kms	>50 kms	Don't know/ missing
National	253	63	30%	13%	37%	21%	20	3,468	35%	28%	37%	0%
Region												
Tigray	31	9	44%	11%	11%	33%	2	213	46%	37%	16%	1%
Afar	6	1	0%	0%	100%	0%	1	69	23%	25%	51%	1%
Amhara	45	13	15%	15%	54%	15%	1	817	29%	26%	44%	0%
Oromia	66	11	27%	0%	64%	9%	3	1,325	30%	30%	39%	0%
Somali	7	3	33%	0%	33%	33%	2	149	11%	17%	72%	0%
Benishangul-Gumuz	2	1	100%	0%	0%	0%	0	40	20%	20%	60%	0%
SNNP	42	18	22%	28%	33%	17%	7	706	44%	30%	25%	1%
Gambella	1	0					0	26	12%	23%	65%	0%
Harari	6	1	100%	0%	0%	0%	0	8	100%	0%	0%	0%
Addis Ababa	42	5	60%	0%	0%	40%	4	100	92%	0%	7%	1%
Dire Dawa	5	1	0%	0%	0%	100%	0	15	67%	33%	0%	0%
Location												
Urban	237	56	30%	13%	34%	23%	14	1,190	47%	23%	29%	0%
Rural	16	7	29%	14%	57%	0%	6	2,278	28%	30%	41%	0%

[1] Includes MCH specialty clinics and higher clinics.

Table 11.1.3A: Percent distribution of facilities according to time to nearest facility that provided obstetric surgery, by facility type, region, and location, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres						Health centres/clinics[1]					
	Number of facilities that provided surgery in the last 3 months	Number of facilities that did not provide surgery in the last 3 months[2]	Among facilities that did not provide surgery, time to nearest facility that provided surgery in the last 3 months				Number of facilities that provided surgery in the last 3 months	Number of facilities that did not provide surgery in the last 3 months[2]	Among facilities that did not provide surgery, time to nearest facility that provided surgery in the last 3 months			
			<30 min	30-59 min	≥1 hour	Don't know/ missing			<30 min	30-59 min	≥1 hour	Don't know/ missing
National	253	63	35%	19%	25%	21%	20	3,468	30%	26%	42%	1%
Region												
Tigray	31	9	44%	11%	11%	33%	2	213	37%	30%	32%	1%
Afar	6	1	0%	0%	100%	0%	1	69	30%	19%	49%	2%
Amhara	45	13	23%	38%	23%	15%	1	817	28%	24%	48%	0%
Oromia	66	11	18%	9%	64%	9%	3	1,325	23%	29%	47%	0%
Somali	7	3	33%	0%	33%	33%	2	149	15%	13%	72%	0%
B-Gumuz	2	1	100%	0%	0%	0%	0	40	30%	15%	55%	0%
SNNP	42	18	39%	28%	17%	17%	7	706	39%	30%	30%	1%
Gambella	1	0					0	26	15%	8%	77%	0%
Harari	6	1	100%	0%	0%	0%	0	8	100%	0%	0%	0%
Addis Ababa	42	5	60%	0%	0%	40%	4	100	78%	17%	4%	1%
Dire Dawa	5	1	0%	0%	0%	100%	0	15	53%	13%	33%	0%
Location												
Urban	237	56	38%	18%	21%	23%	14	1,190	45%	22%	32%	1%
Rural	16	7	14%	29%	57%	0%	6	2,278	23%	29%	47%	0%

[1] Includes MCH specialty clinics and higher clinics.

Table 11.1.4A: Percent distribution of facilities according to distance to nearest facility with special newborn care unit, by facility type, region, and location, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres						Health centres/clinics[1]					
	Number of facilities that performed all EmNeC SFs in the last 3 months[2]	Number of facilities that did not perform all EmNeC SFs in the last 3 months	Among facilities that did not perform all EmNeC SFs, distance to nearest facility that performed all EmNeC SFs in the last 3 months				Number of facilities that performed all EmNeC SFs in the last 3 months[2]	Number of facilities that did not perform all EmNeC SFs in the last 3 months	Among facilities that did not perform all EmNeC SFs, distance to nearest facility that performed all EmNeC SFs in the last 3 months			
			≤25 kms	26-50 kms	>50 kms	Don't know/ missing			≤25 kms	26-50 kms	>50 kms	Don't know/ missing
National	112	204	28%	14%	22%	36%	4	3,484	34%	27%	36%	2%
Region												
Tigray	9	31	26%	29%	13%	32%	0	215	45%	37%	18%	0%
Afar	2	5	0%	20%	80%	0%	0	70	23%	23%	53%	1%
Amhara	25	33	15%	15%	24%	45%	0	818	28%	26%	43%	2%
Oromia	31	46	24%	4%	37%	35%	0	1,328	30%	30%	38%	2%
Somali	6	4	25%	0%	25%	50%	2	149	11%	15%	70%	3%
Benishangul-Gumuz	2	1	100%	0%	0%	0%	0	40	20%	20%	58%	3%
SNNP	23	37	16%	27%	30%	27%	1	712	43%	29%	24%	3%
Gambella	0	1	0%	0%	0%	100%	0	26	15%	23%	62%	0%
Harari	1	6	67%	0%	0%	33%	0	8	100%	0%	0%	0%
Addis Ababa	10	37	51%	3%	0%	46%	1	103	90%	0%	0%	10%
Dire Dawa	3	3	100%	0%	0%	0%	0	15	67%	33%	0%	0%
Location												
Urban	107	186	30%	13%	20%	37%	3	1,201	47%	23%	28%	2%
Rural	5	18	17%	17%	44%	22%	1	2,283	28%	30%	40%	2%

SF = signal function.

[1] Includes MCH specialty clinics and higher clinics.

[2] Since we did not ask if facilities had a specialized newborn care unit, we used the provision of all 7 newborn SFs in the 3 months prior to the survey as a proxy for providing specialized newborn care.

Table 11.1.5A: Percent distribution of facilities according to time to nearest facility with special newborn care unit, by facility type, region, and location, Ethiopia EmONC, 2016

	Hospitals/MCH specialty centres						Health centres/clinics[1]					
	Number of facilities that performed all EmNeC SFs in the last 3 months[2]	Number of facilities that did not perform all EmNeC SFs in the last 3 months	Among facilities that did not perform all EmNeC SFs, time to nearest facility that performed all EmNeC SFs in the last 3 months				Number of facilities that performed all EmNeC SFs in the last 3 months[2]	Number of facilities that did not perform all EmNeC SFs in the last 3 months	Among facilities that did not perform all EmNeC SFs, time to nearest facility that performed all EmNeC SFs in the last 3 months			
			<30 min	30-59 min	≥1 hour	Don't know/ missing			<30 min	30-59 min	≥1 hour	Don't know/ missing
National	112	204	34%	12%	20%	34%	4	3,484	30%	26%	42%	2%
Region												
Tigray	9	31	29%	13%	26%	32%	0	215	36%	30%	33%	1%
Afar	2	5	60%	20%	20%	0%	0	70	30%	17%	51%	1%
Amhara	25	33	21%	18%	15%	45%	0	818	27%	24%	48%	1%
Oromia	31	46	22%	7%	37%	35%	0	1,328	23%	29%	47%	1%
Somali	6	4	25%	0%	25%	50%	2	149	17%	11%	65%	7%
B-Gumuz	2	1	100%	0%	0%	0%	0	40	30%	15%	55%	0%
SNNP	23	37	30%	24%	22%	24%	1	712	38%	30%	30%	2%
Gambella	0	1	0%	0%	0%	100%	0	26	19%	8%	73%	0%
Harari	1	6	67%	0%	0%	33%	0	8	100%	0%	0%	0%
Addis Ababa	10	37	54%	5%	0%	41%	1	103	78%	16%	0%	7%
Dire Dawa	3	3	100%	0%	0%	0%	0	15	53%	13%	33%	0%
Location												
Urban	107	186	35%	11%	18%	35%	3	1,201	44%	22%	33%	2%
Rural	5	18	22%	22%	33%	22%	1	2,283	22%	29%	47%	2%

SF = signal function.

[1] Includes MCH specialty clinics and higher clinics.

[2] Since we did not ask if facilities had a specialized newborn care unit, we used the provision of all 7 newborn SFs in the 3 months prior to the survey as a proxy for providing specialized newborn care.

Table 11.2.3A: Percent of facilities with a functional ambulance where the ambulance was equipped with selected items, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with a functional motorized ambulance[1]	Dedicated communi-cation device in vehicle (or on driver)	IV stand	Radiant heater	Stretcher	Pressure dressings	Splints	Protective wear for attendants	Oxygen	Ambu bag and mask for adults	Ambu bag and mask for newborns	Advanced life support equipment	Emergency drug and supply kit
National	661	34%	44%	9%	91%	24%	18%	25%	31%	27%	22%	20%	34%
Region													
Tigray	52	27%	29%	6%	85%	19%	19%	31%	10%	13%	13%	13%	25%
Afar	31	10%	35%	10%	84%	19%	19%	10%	29%	10%	3%	6%	10%
Amhara	149	44%	42%	4%	89%	13%	8%	14%	22%	14%	11%	17%	38%
Oromia	134	43%	50%	12%	97%	34%	19%	28%	37%	39%	30%	25%	40%
Somali	94	15%	26%	4%	86%	15%	15%	30%	15%	20%	16%	11%	24%
B-Gumuz	32	3%	28%	9%	94%	13%	13%	25%	25%	19%	19%	19%	34%
SNNP	86	32%	45%	8%	88%	27%	16%	14%	38%	29%	22%	14%	35%
Gambella	7	0%	29%	29%	86%	14%	14%	14%	0%	0%	0%	0%	14%
Harari	8	0%	63%	25%	88%	50%	50%	63%	63%	63%	63%	38%	13%
Addis Ababa	55	40%	82%	25%	95%	53%	44%	58%	79%	62%	60%	49%	56%
Dire Dawa	13	31%	62%	0%	100%	38%	15%	15%	38%	38%	38%	46%	23%
Facility type													
Referral/specialized hospitals	25	8%	48%	12%	92%	28%	28%	28%	60%	36%	36%	16%	24%
General hospitals	82	29%	68%	17%	91%	43%	34%	39%	66%	52%	44%	37%	49%
Primary hospitals	89	38%	53%	11%	97%	29%	19%	27%	43%	34%	30%	26%	33%
MCH specialty centres	20	50%	90%	25%	95%	70%	40%	55%	75%	70%	60%	65%	70%
Health centres	437	31%	34%	6%	89%	17%	13%	20%	18%	17%	14%	13%	30%
MCH specialty clinics	4	25%	50%	0%	75%	25%	25%	50%	50%	50%	50%	25%	25%
Higher clinics	4	75%	75%	0%	100%	50%	25%	75%	50%	50%	50%	50%	50%

	Number of facilities with a functional motorized ambulance[1]	Dedicated communi-cation device in vehicle (or on driver)	IV stand	Radiant heater	Stretcher	Pressure dressings	Splints	Protective wear for attendants	Oxygen	Ambu bag and mask for adults	Ambu bag and mask for newborns	Advanced life support equipment	Emergency drug and supply kit
Managing authority													
Public/government	571	30%	38%	6%	91%	19%	13%	20%	27%	20%	17%	15%	30%
Private-for-profit	57	46%	86%	35%	95%	67%	56%	63%	83%	79%	74%	61%	67%
Private-not-for-profit[2]	33	33%	61%	12%	79%	42%	24%	39%	24%	45%	33%	30%	52%
Location													
Urban	452	32%	46%	9%	92%	27%	20%	27%	37%	31%	27%	23%	35%
Rural	209	31%	39%	10%	87%	18%	12%	21%	19%	19%	13%	12%	33%

[1] Two missing responses.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.2.4A: Percent of facilities with non-ambulance transport and whether it was functional or needed repair, by type of transport, region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities	Motor vehicle non-ambulance		Motorcycle/tricycle non-ambulance		Other motorized vehicle non-ambulance		Bicycle	
		Available, functional	Available, needs repair	Available, functional	Available, needs repair	Available, functional	Available, needs repair	Available, functional	Available, needs repair
National	3,804	3%	1%	13%	6%	1%	1%	2%	2%
Region									
Tigray	255	2%	1%	15%	5%	1%	0%	0%	1%
Afar	77	1%	0%	13%	3%	0%	0%	0%	0%
Amhara	876	4%	1%	13%	6%	0%	0%	2%	1%
Oromia	1,405	3%	1%	16%	7%	1%	1%	4%	3%
Somali	161	3%	2%	6%	3%	0%	0%	0%	0%
Benishangul-Gumuz	43	9%	7%	21%	12%	5%	2%	0%	0%
SNNP	773	1%	1%	13%	8%	1%	1%	1%	1%
Gambella	27	0%	0%	0%	0%	0%	0%	0%	0%
Harari	15	27%	0%	0%	0%	0%	0%	0%	0%
Addis Ababa	151	8%	1%	3%	1%	0%	0%	1%	0%
Dire Dawa	21	38%	0%	5%	5%	0%	0%	0%	0%
Facility type									
Referral/specialized hospitals	30	13%	10%	3%	0%	3%	0%	3%	0%
General hospitals	103	20%	8%	9%	2%	1%	0%	2%	2%
Primary hospitals	160	28%	6%	9%	6%	0%	0%	2%	1%
MCH specialty centres	23	26%	4%	4%	0%	0%	0%	0%	0%
Health centres	3,459	2%	1%	14%	7%	1%	1%	2%	2%
MCH specialty clinics	16	13%	0%	0%	0%	0%	0%	6%	0%
Higher clinics	13	15%	0%	0%	0%	0%	0%	0%	0%

	Number of facilities	Motor vehicle non-ambulance		Motorcycle/tricycle non-ambulance		Other motorized vehicle non-ambulance		Bicycle	
		Available, functional	Available, needs repair	Available, functional	Available, needs repair	Available, functional	Available, needs repair	Available, functional	Available, needs repair
Managing authority									
Public/government	3,662	3%	1%	14%	7%	1%	1%	2%	2%
Private-for-profit	83	18%	0%	2%	0%	0%	0%	1%	0%
Private-not-for-profit[1]	59	15%	5%	7%	0%	2%	0%	3%	5%
Location									
Urban	1,497	7%	2%	12%	6%	1%	1%	2%	2%
Rural	2,307	1%	1%	14%	7%	1%	1%	2%	2%

[1] Includes NGO, faith-based, or mission facilities.

Table 11.3.1A: Percent distribution of facilities according to staff member in charge of managing or organizing emergency transport system, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities[1]	Nurse/ CO/ midwife	Facility adminis-trator	No one person on duty	Medical officer	Liaison officer	Transport officer	Other	Don't know/ missing	Total
National	3,798	36%	27%	23%	7%	5%	1%	2%	0%	100%
Region										
Tigray	255	44%	11%	25%	11%	6%	0%	2%	0%	100%
Afar	77	9%	16%	29%	32%	3%	0%	12%	0%	100%
Amhara	875	33%	38%	19%	5%	4%	0%	1%	0%	100%
Oromia	1,404	43%	22%	24%	3%	5%	1%	1%	0%	100%
Somali	161	25%	27%	11%	34%	2%	1%	0%	1%	100%
Benishangul-Gumuz	43	14%	47%	12%	12%	9%	0%	7%	0%	100%
SNNP	769	28%	32%	29%	4%	4%	0%	1%	0%	100%
Gambella	27	15%	67%	4%	7%	0%	4%	4%	0%	100%
Harari	15	7%	33%	0%	47%	13%	0%	0%	0%	100%
Addis Ababa	151	42%	21%	11%	6%	11%	3%	5%	1%	100%
Dire Dawa	21	57%	14%	0%	14%	14%	0%	0%	0%	100%
Facility type										
Referral/specialized hospitals	30	10%	0%	0%	3%	77%	10%	0%	0%	100%
General hospitals	103	12%	26%	7%	11%	39%	1%	5%	0%	100%
Primary hospitals	159	21%	23%	14%	13%	27%	1%	1%	1%	100%
MCH specialty centres	23	26%	48%	4%	9%	4%	0%	9%	0%	100%
Health centres	3,454	37%	28%	24%	6%	2%	1%	2%	0%	100%
MCH specialty clinics	16	38%	13%	19%	19%	0%	0%	6%	6%	100%
Higher clinics	13	46%	23%	8%	15%	0%	0%	0%	8%	100%
Managing authority										
Public/government	3,656	36%	27%	23%	6%	5%	1%	2%	0%	100%
Private-for-profit	83	25%	31%	10%	11%	11%	2%	7%	2%	100%
Private-not-for-profit[2]	59	25%	37%	10%	14%	5%	0%	7%	2%	100%
Location										
Urban	1,493	37%	26%	18%	7%	9%	1%	2%	0%	100%
Rural	2,305	35%	29%	25%	6%	2%	0%	2%	0%	100%

CO = clinical officer.

[1] Six health facilities with missing data.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.3.2A: Percent of facilities with a functional motorized ambulance that had written ambulance guidelines, and who produced the guidelines, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with a functional motorized ambulance[1]	Among facilities with ambulance guidelines							
		Ambulance use regulated by written guidelines	Guidelines were observed by data collector	Guidelines produced by:					
				Facility	Woreda/ District Health Office	Regional Health Bureau	MOH/ MCHD	Other	Don't know
National	661	26%	44%	29%	11%	21%	24%	8%	7%
Region									
Tigray	52	40%	24%	14%	10%	0%	10%	52%	14%
Afar	31	26%	50%	13%	13%	50%	25%	0%	0%
Amhara	149	17%	42%	35%	19%	23%	19%	4%	0%
Oromia	134	31%	49%	24%	10%	27%	27%	5%	7%
Somali	94	12%	27%	36%	18%	18%	18%	0%	9%
Benishangul-Gumuz	32	41%	54%	23%	8%	31%	31%	0%	8%
SNNP	86	37%	47%	22%	9%	22%	38%	0%	9%
Gambella	7	29%	50%	50%	0%	0%	50%	0%	0%
Harari	8	25%	50%	100 %	0%	0%	0%	0%	0%
Addis Ababa	55	27%	53%	67%	0%	7%	20%	0%	7%
Dire Dawa	13	8%	0%	0%	0%	100%	0%	0%	0%
Facility type									
Referral/specialized hospitals	25	36%	33%	33%	0%	11%	44%	0%	11%
General hospitals	82	37%	57%	50%	0%	13%	33%	3%	0%
Primary hospitals	89	39%	43%	23%	6%	34%	20%	9%	9%
MCH specialty centres	20	40%	63%	100%	0%	0%	0%	0%	0%
Health centres	437	20%	37%	16%	18%	22%	24%	11%	9%
MCH specialty clinics	4	0%	0%	0%	0%	0%	0%	0%	0%
Higher clinics	4	50%	100%	100%	0%	0%	0%	0%	0%
Managing authority									
Public/government	571	26%	41%	19%	12%	24%	28%	9%	8%
Private-for-profit	57	19%	45%	91%	0%	0%	9%	0%	0%
Private-not-for-profit[2]	33	36%	75%	100%	0%	0%	0%	0%	0%
Location									
Urban	452	32%	45%	28%	9%	24%	27%	6%	6%
Rural	209	12%	35%	35%	19%	4%	12%	19%	11%

MCHD = maternal and child health department of the Ministry of Health.

[1] Two health facilities with missing information.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.3.3A: Percent of facilities with a functional motorized ambulance that used the ambulance for non-emergency transport purposes, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with a functional motorized ambulance[1]	Take clients home	Immun-ization campaigns	Buy/pick up or deliver supplies or drugs	Carry corpses (dead bodies)	Community outreach	Supervision or monitoring	Pick up or take home facility employees	Travel to trainings or meetings	Other
National	661	48%	25%	23%	20%	20%	15%	11%	8%	2%
Region										
Tigray	52	46%	13%	12%	6%	10%	4%	4%	4%	2%
Afar	31	58%	26%	13%	45%	16%	6%	6%	3%	0%
Amhara	149	58%	14%	16%	10%	15%	11%	7%	2%	4%
Oromia	134	42%	28%	31%	18%	22%	19%	17%	10%	2%
Somali	94	51%	39%	28%	41%	30%	24%	7%	16%	1%
B-Gumuz	32	50%	44%	28%	38%	41%	22%	16%	9%	3%
SNNP	86	36%	28%	16%	19%	26%	16%	9%	6%	3%
Gambella	7	57%	57%	29%	0%	57%	57%	0%	57%	0%
Harari	8	25%	0%	25%	0%	0%	13%	38%	0%	0%
Addis Ababa	55	36%	11%	31%	18%	5%	7%	22%	11%	2%
Dire Dawa	13	62%	54%	38%	8%	31%	23%	15%	8%	0%
Facility type										
Referral/specialized hospitals	25	28%	4%	36%	20%	8%	8%	20%	16%	0%
General hospitals	82	39%	10%	29%	17%	12%	13%	27%	12%	0%
Primary hospitals	89	36%	12%	20%	17%	15%	7%	13%	2%	2%
MCH specialty centres	20	45%	10%	15%	25%	20%	0%	5%	0%	0%
Health centres	437	52%	33%	22%	22%	24%	19%	7%	8%	3%
MCH specialty clinics	4	75%	0%	25%	0%	0%	0%	0%	0%	1%
Higher clinics	4	75%	0%	50%	25%	25%	0%	50%	0%	1%
Managing authority										
Public/government	571	47%	26%	22%	20%	21%	16%	10%	7%	3%
Private-for-profit	57	54%	9%	30%	21%	9%	7%	26%	9%	0%
Private-not-for-profit[2]	33	45%	27%	27%	21%	30%	15%	9%	9%	0%
Location										
Urban	452	44%	20%	22%	18%	17%	12%	12%	6%	2%
Rural	209	56%	35%	24%	25%	28%	22%	10%	12%	4%

[1] Two health facilities with missing information.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.4.1A: Percent of facilities that referred out using different transport strategies,[1] by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that referred out	Facility had own means of transport	Called dispatch centre for transport	Used vehicles from District Health Office	Used vehicles from local council	Had agreements with private parties (taxis, cars, etc.)	Assumed clients would provide own transport
National	3,740	25%	31%	62%	12%	3%	33%
Region							
Tigray	251	44%	67%	47%	22%	11%	30%
Afar	76	41%	38%	18%	5%	3%	24%
Amhara	867	22%	42%	53%	10%	2%	36%
Oromia	1,386	21%	20%	73%	11%	3%	36%
Somali	154	53%	14%	35%	8%	16%	37%
Benishangul-Gumuz	43	74%	7%	40%	21%	0%	21%
SNNP	762	17%	27%	81%	17%	1%	29%
Gambella	26	27%	0%	69%	12%	0%	19%
Harari	15	53%	20%	0%	0%	0%	0%
Addis Ababa	139	39%	47%	15%	7%	3%	32%
Dire Dawa	21	62%	24%	0%	14%	0%	5%
Facility type							
Referral/specialized hospitals	20	65%	30%	20%	15%	10%	45%
General hospitals	84	79%	39%	35%	17%	5%	39%
Primary hospitals	150	56%	43%	54%	17%	3%	27%
MCH specialty centres	21	100%	14%	0%	0%	0%	29%
Health centres	3,437	21%	30%	64%	12%	3%	33%
MCH specialty clinics	16	69%	6%	0%	0%	0%	63%
Higher clinics	12	42%	25%	42%	0%	42%	50%
Managing authority							
Public/government	3,615	24%	31%	64%	13%	3%	33%
Private-for-profit	68	76%	16%	10%	3%	12%	51%
Private-not-for-profit[2]	57	63%	18%	44%	7%	2%	25%
Location							
Urban	1,449	35%	34%	54%	14%	3%	34%
Rural	2,291	19%	29%	68%	12%	3%	32%

[1] Multiple responses allowed.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.4.2A: Percent of facilities that referred out according to their most common maternal complications requiring referral,[1] by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that referred out	Prolonged/ obstructed labour	Haemor-rhage	PE/E	Malpres-entation	Foetal distress	PROM	Preterm labour	Previous caesarean delivery	Sepsis	Non-obstetric medical problems			Big baby	Teenage pregnancy	Other
											HIV	Malaria	Severe anaemia			
National	3,740	80%	50%	41%	39%	21%	19%	10%	9%	6%	2%	1%	9%	3%	1%	2%
Region																
Tigray	251	79%	54%	38%	38%	23%	28%	16%	10%	10%	1%	1%	12%	2%	1%	2%
Afar	76	79%	41%	43%	18%	22%	16%	12%	7%	22%	3%	0%	22%	4%	0%	5%
Amhara	867	83%	54%	45%	36%	19%	20%	12%	5%	6%	2%	1%	7%	4%	1%	2%
Oromia	1,386	81%	52%	42%	43%	17%	18%	7%	7%	4%	1%	0%	8%	3%	1%	1%
Somali	154	79%	64%	57%	31%	26%	12%	12%	17%	26%	8%	6%	31%	9%	5%	0%
B-Gumuz	43	91%	42%	51%	44%	30%	19%	12%	26%	9%	0%	12%	14%	7%	0%	0%
SNNP	762	79%	47%	34%	45%	27%	16%	10%	12%	4%	1%	1%	7%	2%	1%	2%
Gambella	26	85%	38%	23%	23%	23%	15%	4%	4%	12%	0%	4%	35%	0%	0%	0%
Harari	15	60%	47%	33%	40%	20%	20%	0%	0%	0%	0%	0%	33%	13%	0%	0%
Addis Ababa	139	59%	24%	39%	16%	31%	42%	16%	16%	6%	1%	1%	1%	3%	1%	4%
Dire Dawa	21	71%	5%	67%	24%	29%	57%	5%	24%	0%	0%	0%	48%	0%	0%	10%
Facility type																
Referral/specialized hospitals	20	15%	10%	25%	10%	0%	5%	10%	0%	5%	0%	0%	10%	0%	0%	25%
General hospitals	84	19%	27%	29%	11%	12%	11%	6%	6%	12%	0%	2%	19%	2%	0%	18%
Primary hospitals	150	41%	50%	39%	14%	15%	14%	10%	7%	8%	0%	1%	23%	3%	1%	14%
MCH specialty centres	21	24%	0%	29%	5%	24%	24%	24%	5%	0%	14%	5%	0%	0%	0%	5%
Health centres	3,437	84%	51%	42%	42%	22%	20%	10%	9%	6%	2%	1%	9%	3%	1%	0%
MCH specialty clinics	16	50%	31%	38%	19%	38%	25%	19%	19%	0%	0%	0%	0%	0%	0%	6%
Higher clinics	12	50%	67%	58%	33%	17%	25%	25%	25%	17%	17%	0%	0%	8%	0%	0%

	Number of facilities that referred out	Prolonged/ obstructed labour	Haemor-rhage	PE/E	Malpres-entation	Foetal distress	PROM	Preterm labour	Previous caesarean delivery	Sepsis	Non-obstetric medical problems			Big baby	Teenage pregnancy	Other
											HIV	Malaria	Severe anaemia			
Managing authority																
Public/government	3,615	81%	51%	42%	40%	21%	20%	10%	9%	6%	1%	1%	10%	3%	1%	1%
Private-for-profit	68	19%	26%	32%	10%	19%	15%	22%	12%	12%	6%	3%	0%	3%	0%	12%
Private-not-for-profit[2]	57	60%	32%	46%	28%	32%	16%	9%	12%	5%	7%	2%	5%	4%	2%	7%
Location																
Urban	1,449	75%	49%	44%	33%	22%	24%	10%	10%	7%	1%	1%	10%	3%	1%	3%
Rural	2,291	83%	50%	40%	43%	21%	16%	10%	8%	6%	2%	1%	9%	4%	1%	1%

PE/E = pre-eclampsia/eclampsia; PROM = premature rupture of membranes.

[1] Facilities were asked to provide their 3 most common indications for referral. For example, 80% of facilities mentioned prolonged/obstructed labour among their top 3 indications.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.4.3A: Percent distribution of facilities that referred out according to their most common newborn complication requiring referral, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that referred out	Asphyxia	Low birth weight	Prema-turity	Respiratory difficulties	Sepsis	Congenital abnormality	Failure to suck	Jaundice	Hypo-thermia	High fever	Other	Never refer newborns	Doesn't know, referral rare	Total
National	3,740	22%	18%	15%	11%	9%	4%	5%	1%	1%	1%	1%	4%	7%	100%
Region															
Tigray	251	14%	12%	28%	12%	15%	7%	5%	1%	1%	1%	1%	0%	2%	100%
Afar	76	17%	12%	8%	21%	13%	7%	4%	0%	0%	3%	1%	7%	8%	100%
Amhara	867	18%	23%	19%	8%	10%	3%	3%	2%	1%	0%	0%	4%	8%	100%
Oromia	1,386	25%	17%	13%	10%	11%	4%	5%	1%	1%	1%	1%	4%	7%	100%
Somali	154	26%	16%	8%	16%	6%	6%	2%	3%	1%	0%	3%	5%	8%	100%
B-Gumuz	43	28%	16%	5%	16%	9%	2%	2%	0%	2%	0%	5%	5%	9%	100%
SNNP	762	19%	17%	15%	15%	5%	4%	10%	1%	1%	1%	1%	6%	5%	100%
Gambella	26	4%	19%	0%	4%	0%	0%	8%	4%	0%	0%	0%	46%	15%	100%
Harari	15	20%	67%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	7%	100%
Addis Ababa	139	35%	14%	9%	15%	3%	6%	7%	5%	1%	0%	1%	1%	3%	100%
Dire Dawa	21	57%	29%	0%	5%	5%	5%	0%	0%	0%	0%	0%	0%	0%	100%
Facility type															
Referral/specialized hospitals	20	10%	0%	10%	0%	0%	50%	0%	0%	0%	0%	0%	15%	15%	100%
General hospitals	84	12%	11%	8%	8%	6%	31%	0%	13%	0%	0%	5%	2%	4%	100%
Primary hospitals	150	11%	9%	17%	11%	13%	14%	1%	10%	0%	1%	2%	4%	8%	100%
MCH specialty centres	21	14%	14%	5%	33%	5%	5%	0%	10%	0%	5%	0%	5%	5%	100%
Health centres	3,437	23%	19%	15%	11%	9%	3%	6%	1%	1%	1%	1%	4%	7%	100%
MCH specialty clinics	16	13%	6%	38%	19%	6%	0%	0%	0%	6%	0%	0%	0%	13%	100%
Higher clinics	12	25%	33%	17%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

	Number of facilities that referred out	Asphyxia	Low birth weight	Prema-turity	Respiratory difficulties	Sepsis	Congenital abnormality	Failure to suck	Jaundice	Hypo-thermia	High fever	Other	Never refer newborns	Doesn't know, referral rare	Total
Managing authority															
Public/government	3,615	22%	18%	15%	11%	9%	4%	6%	1%	1%	1%	1%	4%	7%	100%
Private-for-profit	68	24%	19%	13%	16%	6%	7%	0%	7%	1%	0%	3%	0%	3%	100%
Private-not-for-profit[1]	57	19%	12%	14%	23%	2%	4%	2%	2%	4%	2%	4%	9%	5%	100%
Location															
Urban	1,449	25%	17%	14%	12%	9%	6%	4%	3%	1%	1%	1%	3%	5%	100%
Rural	2,291	20%	19%	15%	11%	9%	3%	6%	1%	1%	1%	1%	5%	8%	100%

[1] Includes NGO, faith-based, or mission facilities.

Table 11.4.5A: Percent of facilities that referred out and received referrals that required certain fees for maternal and newborn referrals, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Facilities that referred out		Facilities that received referrals		
	Number of facilities that referred out	Expenses must be cleared prior to referral out	Number of facilities that received referrals	Expenses must be cleared prior to treatment	
				For a woman referred in	For a newborn referred in
National	3,740	22%	3,591	4%	6%
Region					
Tigray	251	29%	245	3%	2%
Afar	76	53%	61	0%	2%
Amhara	867	22%	846	3%	6%
Oromia	1,386	18%	1,318	3%	6%
Somali	154	37%	147	10%	8%
Benishangul-Gumuz	43	16%	41	0%	2%
SNNP	762	14%	752	2%	4%
Gambella	26	46%	17	12%	6%
Harari	15	13%	14	14%	21%
Addis Ababa	139	43%	129	21%	24%
Dire Dawa	21	24%	21	19%	19%
Facility type					
Referral/specialized hospitals	20	55%	29	14%	31%
General hospitals	84	49%	95	27%	36%
Primary hospitals	150	29%	155	7%	10%
MCH specialty centres	21	90%	20	75%	75%
Health centres	3,437	20%	3,274	2%	4%
MCH specialty clinics	16	81%	10	40%	40%
Higher clinics	12	83%	8	63%	63%
Managing authority					
Public/government	3,615	20%	3,474	2%	4%
Private-for-profit	68	88%	67	69%	73%
Private-not-for-profit[1]	57	46%	50	24%	24%
Location					
Urban	1,449	25%	1,396	6%	9%
Rural	2,291	20%	2,195	2%	4%

[1] Includes NGO, faith-based, or mission facilities.

Table 11.4.6A: Percent of facilities that referred out that required payment for fees/fuel for emergency transport to a higher level of care for certain types of clients, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that referred out	Peripartum women (in labour or postpartum)	Families of newborns with complications	Families with sick neonates	A sick adult (unrelated to pregnancy)
National	3,740	10%	9%	10%	34%
Region					
Tigray	251	14%	13%	14%	21%
Afar	76	38%	34%	39%	13%
Amhara	867	10%	9%	11%	41%
Oromia	1,386	6%	5%	6%	40%
Somali	154	19%	19%	17%	21%
Benishangul-Gumuz	43	30%	35%	35%	58%
SNNP	762	7%	3%	5%	26%
Gambella	26	42%	46%	46%	58%
Harari	15	20%	13%	13%	20%
Addis Ababa	139	24%	22%	22%	27%
Dire Dawa	21	5%	10%	10%	10%
Facility type					
Referral/specialized hospitals	20	15%	20%	20%	30%
General hospitals	84	32%	35%	37%	56%
Primary hospitals	150	13%	14%	18%	44%
MCH specialty centres	21	52%	48%	52%	57%
Health centres	3,437	9%	7%	8%	33%
MCH specialty clinics	16	38%	25%	25%	25%
Higher clinics	12	33%	33%	42%	50%
Managing authority					
Public/government	3,615	9%	8%	9%	34%
Private-for-profit	68	60%	50%	53%	59%
Private-not-for-profit[1]	57	23%	19%	19%	40%
Location					
Urban	1,449	12%	12%	13%	35%
Rural	2,291	9%	7%	8%	34%

[1] Includes NGO, faith-based, or mission facilities.

Table 11.4.7A: Percent of facilities that received referrals and provided different types of support to families accompanying referred maternity clients, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that received referrals	Food	Lodging	Other
National	3,591	26%	29%	1%
Region				
Tigray	245	11%	57%	6%
Afar	61	12%	31%	2%
Amhara	846	37%	39%	0%
Oromia	1,318	32%	25%	0%
Somali	147	7%	10%	0%
Benishangul-Gumuz	41	29%	59%	2%
SNNP	752	15%	22%	0%
Gambella	17	0%	0%	0%
Harari	14	29%	14%	0%
Addis Ababa	129	7%	16%	0%
Dire Dawa	21	14%	14%	0%
Facility type				
Referral/specialized hospitals	29	38%	41%	0%
General hospitals	95	29%	36%	3%
Primary hospitals	155	15%	31%	1%
MCH specialty centres	20	5%	10%	0%
Health centres	3,274	26%	29%	1%
MCH specialty clinics	10	0%	0%	0%
Higher clinics	8	0%	13%	0%
Managing authority				
Public/government	3,474	26%	29%	1%
Private-for-profit	67	10%	15%	0%
Private-not-for-profit[1]	50	14%	34%	2%
Location				
Urban	1,396	21%	29%	1%
Rural	2,195	29%	29%	1%

[1] Includes NGO, faith-based, or mission facilities.

Table 11.4.9A: Percent distribution of facilities that referred out according to frequency and mechanism of alerting the receiving facilities about incoming clients, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that referred out	Frequency with which staff called ahead to alert receiving facility about incoming client				How staff communicated to alert receiving facility		
		Never	Rarely	Sometimes	Usually	Phone or radio	Text message	Don't know
National	3,740	65%	5%	15%	15%	95%	1%	4%
Region								
Tigray	251	47%	14%	29%	10%	100%	0%	0%
Afar	76	61%	5%	11%	24%	87%	0%	13%
Amhara	867	69%	5%	13%	13%	97%	0%	3%
Oromia	1,386	65%	6%	15%	13%	96%	1%	3%
Somali	154	62%	4%	18%	16%	85%	2%	14%
Benishangul-Gumuz	43	58%	2%	14%	26%	78%	0%	22%
SNNP	762	76%	3%	12%	9%	92%	1%	7%
Gambella	26	69%	4%	15%	12%	75%	0%	25%
Harari	15	53%	0%	20%	27%	100%	0%	0%
Addis Ababa	139	8%	2%	7%	83%	97%	0%	3%
Dire Dawa	21	57%	14%	19%	10%	100%	0%	0%
Facility type								
Referral/specialized hospitals	20	30%	10%	15%	45%	93%	0%	7%
General hospitals	84	26%	4%	20%	50%	98%	0%	2%
Primary hospitals	150	39%	7%	31%	22%	98%	0%	2%
MCH specialty centres	21	24%	0%	10%	67%	100%	0%	0%
Health centres	3,437	67%	5%	14%	13%	95%	1%	5%
MCH specialty clinics	16	38%	13%	6%	44%	100%	0%	0%
Higher clinics	12	25%	25%	17%	33%	89%	0%	11%
Managing authority								
Public/government	3,615	66%	5%	15%	14%	95%	1%	4%
Private-for-profit	68	29%	6%	16%	49%	96%	0%	4%
Private-not-for-profit[1]	57	51%	5%	16%	28%	93%	0%	7%
Location								
Urban	1,449	53%	8%	18%	22%	95%	1%	4%
Rural	2,291	72%	4%	13%	11%	95%	0%	5%

[1] Includes NGO, faith-based, or mission facilities.

Table 11.4.10A: Percent of facilities that received referrals and had a triage system, percent distribution according to frequency of receiving advance notice about incoming clients, and percent that took action upon receiving advance notice, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that received referrals	**Had triage system**	**Frequency with which staff received advance notice about incoming clients**						**Actions taken upon receiving advance notice** (multiple choices possible)				
			Usually	Sometimes	Rarely	Never	Don't know	Total	Notify appropriate health personnel	Prepare space in admissions	Alert pharmacy	Prepare operating theatre	Alert blood bank
National	3,591	29%	22%	19%	8%	51%	0%	100%	90%	74%	51%	8%	5%
Region													
Tigray	245	27%	44%	29%	4%	22%	0%	100%	97%	93%	74%	14%	9%
Afar	61	15%	20%	15%	7%	59%	0%	100%	56%	56%	44%	20%	0%
Amhara	846	24%	22%	20%	8%	50%	1%	100%	89%	71%	52%	6%	3%
Oromia	1,318	26%	13%	16%	10%	61%	0%	100%	91%	75%	43%	7%	4%
Somali	147	33%	16%	22%	9%	52%	2%	100%	77%	61%	51%	14%	6%
Benishangul-Gumuz	41	56%	49%	12%	7%	32%	0%	100%	93%	93%	79%	4%	4%
SNNP	752	31%	30%	20%	7%	43%	0%	100%	92%	68%	51%	6%	3%
Gambella	17	18%	12%	24%	6%	59%	0%	100%	100%	57%	57%	0%	0%
Harari	14	29%	29%	36%	0%	36%	0%	100%	33%	56%	0%	0%	0%
Addis Ababa	129	80%	25%	20%	12%	42%	1%	100%	91%	87%	47%	33%	23%
Dire Dawa	21	14%	5%	19%	10%	67%	0%	100%	57%	29%	0%	0%	0%
Facility type													
Referral/specialized hospitals	29	90%	14%	38%	21%	28%	0%	100%	90%	100%	76%	86%	71%
General hospitals	95	78%	24%	28%	6%	40%	1%	100%	89%	88%	67%	77%	53%
Primary hospitals	155	79%	20%	28%	11%	41%	0%	100%	91%	90%	60%	59%	23%
MCH specialty centres	20	60%	45%	10%	10%	35%	0%	100%	77%	85%	38%	77%	62%
Health centres	3,274	24%	22%	18%	8%	52%	0%	100%	90%	72%	50%	1%	1%
MCH specialty clinics	10	30%	20%	30%	0%	40%	10%	100%	100%	50%	0%	33%	0%

	Number of facilities that received referrals	**Had triage system**	**Frequency with which staff received advance notice about incoming clients**						**Actions taken upon receiving advance notice** (multiple choices possible)				
			Usually	Sometimes	Rarely	Never	Don't know	Total	Notify appropriate health personnel	Prepare space in admissions	Alert pharmacy	Prepare operating theatre	Alert blood bank
Higher clinics	8	38%	13%	25%	38%	13%	13%	100%	57%	57%	14%	0%	0%
Managing authority													
Public/government	3,474	28%	22%	19%	8%	51%	0%	100%	90%	74%	51%	7%	4%
Private-for-profit	67	69%	24%	24%	7%	40%	4%	100%	83%	80%	45%	65%	40%
Private-not-for-profit[1]	50	34%	28%	14%	12%	46%	0%	100%	89%	56%	41%	33%	19%
Location													
Urban	1,396	39%	22%	20%	10%	47%	1%	100%	90%	77%	50%	18%	10%
Rural	2,195	23%	22%	18%	7%	53%	0%	100%	90%	72%	52%	2%	1%

[1] Includes NGO, faith-based, or mission facilities.

Table 11.4.11A: Percent distribution of facilities that referred out and received referrals according to use of referral form and feedback, and percent of facilities that received referrals from community health workers, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Facilities that referred out						Facilities that received referrals from lower level facilities[1]			Facility received women or newborns referred by Health Extension Workers[3]
	Number of facilities that referred out	Clients sent with referral form[2]		Facility used standardized referral form	Feedback received on client treatment and outcomes[1]		Number of facilities that received referrals	Clients arrived with referral form from another facility[2]		
		Usually/ sometimes	Never/ rarely		Usually/ sometimes	Never/ rarely		Usually/ sometimes	Never/ rarely	
National	3,740	96%	4%	52%	26%	74%	1,893	65%	35%	87%
Region										
Tigray	251	99%	1%	82%	60%	40%	142	82%	18%	89%
Afar	76	89%	10%	51%	14%	86%	27	70%	30%	71%
Amhara	867	98%	2%	52%	22%	78%	410	62%	37%	90%
Oromia	1,386	95%	5%	53%	19%	80%	624	63%	37%	88%
Somali	154	92%	7%	40%	21%	78%	108	48%	52%	83%
Benishangul-Gumuz	43	98%	2%	38%	37%	62%	36	47%	52%	72%
SNNP	762	95%	5%	39%	26%	74%	423	64%	37%	93%
Gambella	26	100%	0%	27%	27%	74%	8	100%	0%	59%
Harari	15	100%	0%	93%	14%	87%	6	83%	17%	60%
Addis Ababa	139	98%	2%	83%	57%	41%	102	85%	16%	52%
Dire Dawa	21	100%	0%	100%	67%	29%	7	100%	0%	81%
Facility type										
Referral/specialized hospitals	20	100%	0%	90%	30%	60%	29	100%	0%	13%
General hospitals	84	100%	0%	82%	31%	64%	95	90%	9%	18%
Primary hospitals	150	96%	4%	73%	35%	64%	154	95%	6%	44%
MCH specialty centres	21	100%	0%	67%	38%	43%	20	90%	10%	13%
Health centres	3,437	96%	4%	50%	26%	74%	1,579	59%	41%	93%
MCH specialty clinics	16	88%	13%	71%	19%	81%	9	89%	11%	13%

	Facilities that referred out						Facilities that received referrals from lower level facilities[1]			Facility received women or newborns referred by Health Extension Workers[3]
	Number of facilities that referred out	Clients sent with referral form[2]		Facility used standardized referral form	Feedback received on client treatment and outcomes[1]		Number of facilities that received referrals	Clients arrived with referral form from another facility[2]		
		Usually/ sometimes	Never/ rarely		Usually/ sometimes	Never/ rarely		Usually/ sometimes	Never/ rarely	
Higher clinics	12	92%	8%	45%	8%	92%	7	57%	29%	15%
Managing authority										
Public/government	3,615	96%	4%	52%	26%	74%	1,787	63%	36%	89%
Private-for-profit	68	96%	4%	67%	29%	68%	67	85%	13%	10%
Private-not-for-profit[4]	57	96%	4%	56%	30%	71%	39	72%	28%	54%
Location										
Urban	1,449	97%	3%	64%	32%	67%	938	77%	23%	77%
Rural	2,291	95%	5%	45%	22%	78%	955	53%	47%	94%

[1] The question about the use of a referral form from the perspective of facilities receiving referrals was administered only to facilities that affirmed they received referrals from lower level facilities; it did not include facilities that received referrals from the community.

[2] Percent distributions may not sum to 100 percent due to rounding or 'don't know' responses (not shown).

[3] Based on all facilities n=3,804.

[4] Includes NGO, faith-based, or mission facilities.

Table 11.4.12A: Percent distribution of facilities that referred out according to frequency of providing a medical escort for referred clients, and among those, percent of facilities that sent selected health workers as medical escorts, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that referred out	Frequency of medical escort for referred clients						Number of facilities that sent a medical escort[1]	Among facilities that sent a medical escort,[1] health worker sent (multiple choices possible)					
		Usually	Sometimes	Rarely	Never	Don't know	Total		Midwife	Health extension worker	Nurse	Health officer	Emergency surgical officer	Doctor
National	3,740	52%	24%	7%	17%	0%	100 %	3,101	84%	1%	69%	25%	1%	1%
Region														
Tigray	251	81%	14%	2%	3%	0%	100%	244	93%	4%	81%	38%	5%	1%
Afar	76	49%	18%	5%	28%	0%	100%	55	85%	0%	73%	22%	0%	2%
Amhara	867	50%	28%	7%	14%	0%	100%	743	95%	1%	56%	17%	0%	0%
Oromia	1,386	39%	22%	10%	29%	0%	100%	989	70%	2%	64%	15%	1%	1%
Somali	154	50%	39%	3%	7%	1%	100%	142	82%	8%	89%	27%	1%	1%
Benishangul-Gumuz	43	84%	14%	2%	0%	0%	100%	43	100%	2%	72%	47%	0%	0%
SNNP	762	66%	28%	3%	4%	0%	100%	735	91%	1%	81%	46%	1%	1%
Gambella	26	46%	42%	8%	4%	0%	100%	25	64%	0%	88%	24%	0%	0%
Harari	15	33%	20%	27%	20%	0%	100%	12	42%	0%	67%	0%	0%	0%
Addis Ababa	139	52%	14%	6%	28%	0%	100%	100	76%	0%	63%	7%	0%	3%
Dire Dawa	21	48%	10%	5%	38%	0%	100%	13	15%	0%	85%	0%	0%	0%
Facility type														
Referral/specialized hospitals	20	65%	10%	10%	15%	0%	100%	17	88%	0%	76%	12%	0%	0%
General hospitals	84	67%	21%	5%	7%	0%	100%	78	77%	1%	68%	5%	5%	9%
Primary hospitals	150	63%	22%	7%	7%	0%	100%	139	90%	0%	63%	20%	10%	3%
MCH specialty centres	21	62%	24%	14%	0%	0%	100%	21	76%	0%	76%	10%	5%	5%
Health centres	3,437	51%	25%	7%	18%	0%	100%	2,822	84%	2%	69%	27%	1%	0%

	Number of facilities that referred out	Frequency of medical escort for referred clients						Number of facilities that sent a medical escort[1]	Among facilities that sent a medical escort,[1] health worker sent (multiple choices possible)					
		Usually	Sometimes	Rarely	Never	Don't know	Total		Midwife	Health extension worker	Nurse	Health officer	Emergency surgical officer	Doctor
MCH specialty clinics	16	50%	13%	25%	13%	0%	100%	14	86%	0%	64%	0%	0%	0%
Higher clinics	12	42%	25%	17%	8%	8%	100%	10	45%	0%	73%	9%	0%	9%
Managing authority														
Public/government	3,615	52%	24%	7%	17%	0%	100%	2,989	84%	2%	69%	26%	1%	0%
Private-for-profit	68	52%	21%	16%	10%	1%	100%	60	68%	2%	72%	5%	2%	8%
Private-not-for-profit[2]	57	47%	35%	9%	9%	0%	100%	52	77%	0%	73%	17%	0%	6%
Location														
Urban	1,449	56%	22%	8%	14%	0%	100%	1,251	83%	1%	65%	23%	2%	1%
Rural	2,291	49%	26%	6%	19%	0%	100%	1,850	84%	2%	72%	27%	0%	0%

[1] Analysis conducted among facilities that referred out and reported 'usually,' 'sometimes,' or 'rarely' sent a medical escort. Two cases were missing.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.4.13A: Percent of facilities that referred out and were required to report number of referrals, had logbook for referrals only, staff recorded referrals, and average number of referrals per month, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that referred out	Required to report (monthly/quarterly) number of clients referred out	Had logbook exclusively for maternity clients referred out	Staff record referrals out in L&D or maternity ward logbooks	Average number of clients referred out per month[1]	
					Obstetric	Newborn
National	3,740	65%	53%	53%	4	2
Region						
Tigray	251	100%	91%	76%	4	2
Afar	76	83%	51%	50%	3	2
Amhara	867	73%	47%	52%	3	1
Oromia	1,386	57%	51%	53%	4	2
Somali	154	64%	27%	32%	3	2
Benishangul-Gumuz	43	70%	51%	33%	6	1
SNNP	762	56%	54%	50%	4	2
Gambella	26	54%	12%	12%	2	2
Harari	15	40%	27%	20%	3	2
Addis Ababa	139	80%	73%	77%	13	3
Dire Dawa	21	86%	86%	76%	4	1
Facility type						
Referral/specialized hospitals	20	90%	75%	65%	25	5
General hospitals	84	75%	58%	63%	5	3
Primary hospitals	150	82%	77%	71%	5	2
MCH specialty centres	21	76%	52%	62%	4	2
Health centres	3,437	64%	52%	52%	4	1
MCH specialty clinics	16	69%	44%	56%	4	2
Higher clinics	12	25%	33%	50%	7	5
Managing authority						
Public/government	3,615	65%	53%	53%	4	2
Private-for-profit	68	49%	35%	50%	4	3
Private-not-for-profit[2]	57	77%	60%	60%	5	2
Location						
Urban	1,449	67%	65%	62%	6	2
Rural	2,291	64%	46%	47%	3	1

L&D = labour and delivery.

[1] 146 facilities that referred out did not provide a response to this question.

[2] Includes NGO, faith-based, or mission facilities.

Table 11.4.14A: Percent of facilities that received referrals and were required to report number of incoming referrals, staff recorded incoming referrals in logbooks, and average number of referrals per month, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities that received referrals	Required to report (monthly/quarterly) number of clients referred in	Staff recorded incoming referrals in L&D or maternity ward logbooks	Average number of clients referred in per month	
				Obstetric	Newborn
National	3,591	42%	23%	17	3
Region					
Tigray	245	81%	44%	14	4
Afar	61	38%	23%	4	2
Amhara	846	49%	28%	16	3
Oromia	1,318	30%	17%	17	3
Somali	147	53%	22%	6	3
Benishangul-Gumuz	41	59%	15%	7	1
SNNP	752	38%	21%	21	4
Gambella	17	53%	12%	5	2
Harari	14	7%	21%	14	7
Addis Ababa	129	50%	33%	17	5
Dire Dawa	21	29%	14%	5	0
Facility type					
Referral/specialized hospitals	29	62%	48%	113	36
General hospitals	95	60%	53%	52	19
Primary hospitals	155	54%	45%	29	7
MCH specialty centres	20	40%	35%	22	14
Health centres	3,274	40%	21%	14	2
MCH specialty clinics	10	20%	20%	11	1
Higher clinics	8	0%	0%	5	1
Managing authority					
Public/government	3,474	42%	23%	17	3
Private-for-profit	67	33%	31%	12	6
Private-not-for-profit[1]	50	44%	16%	16	7
Location					
Urban	1,396	43%	29%	22	5
Rural	2,195	41%	19%	13	2

[1] Includes NGO, faith-based, or mission facilities.

Table 11.5.2A: Percent of facilities with their own functioning motorized transport that had driver(s) on staff, and whether driver maintained logbook, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with their own functional motorized transport[1]	Had driver(s) on staff	Had 1 driver per vehicle per 24 hr shift	Had ≥2 drivers per vehicle per 24 hr shift	Among facilities with driver(s), driver maintained logbook
National	1,285	53%	68%	32%	37%
Region					
Tigray	99	58%	44%	55%	50%
Afar	44	91%	65%	35%	38%
Amhara	289	54%	85%	15%	39%
Oromia	427	34%	52%	48%	37%
Somali	97	88%	87%	13%	15%
Benishangul-Gumuz	40	83%	94%	6%	39%
SNNP	194	41%	79%	21%	54%
Gambella	7	100%	100%	0%	0%
Harari	9	100%	33%	68%	11%
Addis Ababa	64	88%	29%	70%	46%
Dire Dawa	15	100%	67%	33%	13%
Facility type					
Referral/specialized hospitals	29	93%	33%	65%	48%
General hospitals	95	96%	54%	46%	45%
Primary hospitals	119	83%	66%	34%	42%
MCH specialty centres	22	95%	29%	71%	48%
Health centres	1,006	43%	76%	24%	33%
MCH specialty clinics	8	75%	17%	83%	33%
Higher clinics	6	83%	60%	40%	60%
Managing authority					
Public/government	1,175	50%	71%	29%	37%
Private-for-profit	68	88%	41%	58%	32%
Private-not-for-profit[2]	42	90%	61%	40%	55%
Location					
Urban	687	68%	64%	36%	42%
Rural	598	36%	77%	23%	27%

[1] Includes functional motorized ambulances plus other motorized transport (bicycles excluded).

[2] Includes NGO, faith-based, or mission facilities.

Table 11.5.3A: Percent of facilities where motorized transport driver maintained a logbook according to logbook maintenance (complete and up-to-date) and items in logbook, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with motorized transport driver who maintained logbook	Logbook columns completed[1]	Logbook was up-to-date[1]	Items in logbook (spontaneous responses/not observed)								
				Date and time of departure	Time of arrival at destination	Drop off location	Mileage at departure	Mileage at destination	Fuel purchase	Purpose of trip	Signature of authorizing officer	All 8 items included in log book
National	254	69%	80%	85%	80%	78%	75%	71%	45%	72%	67%	24%
Region												
Tigray	29	94%	94%	90%	72%	86%	90%	83%	52%	66%	55%	24%
Afar	15	77%	100%	93%	93%	93%	93%	93%	60%	87%	87%	47%
Amhara	61	64%	68%	79%	70%	75%	72%	69%	34%	64%	64%	18%
Oromia	53	66%	83%	91%	87%	79%	64%	57%	35%	68%	55%	9%
Somali	13	33%	50%	77%	85%	62%	38%	46%	62%	54%	69%	15%
Benishangul-Gumuz	13	29%	57%	85%	92%	92%	92%	92%	85%	100%	77%	62%
SNNP	43	71%	86%	81%	74%	65%	79%	77%	43%	72%	74%	23%
Gambella	0	-	-	-	-	-	-	-	-	-	-	-
Harari	1	0%	100%	100%	100%	100%	0%	0%	100%	100%	100%	0%
Addis Ababa	24	82%	83%	92%	92%	83%	85%	83%	58%	92%	83%	46%
Dire Dawa	2	50%	100%	100%	100%	100%	0%	0%	0%	50%	50%	0%
Facility type												
Referral/specialized hospitals	12	83%	100%	83%	83%	83%	75%	67%	46%	83%	92%	25%
General hospitals	40	78%	83%	88%	78%	80%	80%	80%	56%	73%	78%	43%
Primary hospitals	42	70%	83%	88%	69%	74%	79%	76%	42%	71%	71%	24%
MCH specialty centres	10	89%	89%	100%	100%	80%	90%	90%	60%	90%	90%	50%
Health centres	145	64%	77%	82%	82%	78%	71%	66%	43%	68%	59%	17%
MCH specialty clinics	2	0%	50%	100%	100%	50%	100%	100%	0%	100%	100%	0%
Higher clinics	3	67%	67%	100%	100%	100%	67%	67%	67%	100%	67%	67%

	Number of facilities with motorized transport driver who maintained logbook	Logbook columns completed[1]	Logbook was up-to-date[1]	**Items in logbook** (spontaneous responses/not observed)								
				Date and time of departure	Time of arrival at destination	Drop off location	Mileage at departure	Mileage at destination	Fuel purchase	Purpose of trip	Signature of authorizing officer	All 8 items included in log book
Managing authority												
Public/government	215	67%	79%	83%	77%	77%	72%	68%	43%	70%	66%	20%
Private-for-profit	18	77%	77%	94%	94%	94%	83%	83%	63%	83%	61%	50%
Private-not-for-profit[2]	21	73%	87%	100%	100%	81%	100%	95%	57%	76%	86%	43%
Location												
Urban	196	71%	83%	86%	81%	78%	73%	71%	47%	72%	70%	25%
Rural	58	61%	70%	84%	79%	79%	83%	71%	40%	69%	57%	21%

[1] Based on data collectors' observations of logbooks (n=143).

[2] Includes NGO, faith-based, or mission facilities.

Table 11.5.4A: Percent of facilities with motorized transport drivers on-staff where drivers were available and trained in first aid, and topics covered in training, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with motorized transport driver(s) on-staff	Driver(s) usually available	Driver(s) received first aid training	Number of facilities with first-aid trained drivers	Among facilities with first-aid trained drivers, percent where training included:											
					Airway manag e-ment	External bleeding control	Splinting external extremities	Principles of spinal precaution	Triage	Crash scene manage-ment	Extrica -tion	Use of fire extingu-isher	Minor mechanics for vehicle	Preventive mainten-ance	Defensive driving	How to complete logbook
National	683	93%	8%	56	75%	91%	55%	45%	45%	39%	29%	84%	39%	41%	29%	36%
Region																
Tigray	58	97%	9%	5	60%	100%	60%	80%	100%	100%	20%	100%	100%	100%	60%	60%
Afar	40	98%	3%	1	100%	100%	100 %	100 %	100%	100%	0%	100%	0%	0%	0%	0%
Amhara	157	94%	12%	19	79%	95%	68%	53%	37%	32%	42%	79%	26%	32%	21%	26%
Oromia	143	89%	10%	15	87%	93%	60%	47%	40%	33%	27%	80%	33%	40%	27%	40%
Somali	85	87%	2%	2	100%	100%	50%	0%	0%	0%	0%	100%	50%	50%	50%	100%
Benishangul-Gumuz	33	97%	0%	0												
SNNP	80	96%	8%	6	67%	100%	33%	17%	50%	33%	17%	83%	50%	33%	17%	17%
Gambella	7	100%	0%	0												
Harari	9	100%	11%	1	0%	100%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%
Addis Ababa	56	93%	9%	5	80%	80%	40%	40%	40%	60%	40%	100%	60%	60%	60%	60%
Dire Dawa	15	87%	13%	2	0%	0%	0%	0%	50%	0%	0%	50%	0%	0%	0%	0%
Facility type																
Referral/specia lized hospitals	27	92%	7%	2	0%	50%	50%	0%	0%	0%	0%	50%	50%	50%	50%	0%
General hospitals	91	92%	12%	11	91%	91%	64%	55%	55%	64%	55%	100%	64%	73%	45%	64%
Primary hospitals	99	95%	9%	9	78%	89%	56%	56%	44%	33%	22%	67%	22%	22%	22%	22%
MCH specialty centres	21	95%	14%	3	100%	100%	67%	0%	33%	0%	0%	100%	67%	67%	67%	67%
Health centres	434	93%	7%	30	70%	93%	53%	47%	47%	40%	27%	83%	30%	30%	20%	27%

	Number of facilities with motorized transport driver(s) on-staff	Driver(s) usually available	Driver(s) received first aid training	Number of facilities with first-aid trained drivers	Among facilities with first-aid trained drivers, percent where training included:											
					Airway manag e-ment	External bleeding control	Splinting external extremities	Principles of spinal precaution	Triage	Crash scene manage-ment	Extrica -tion	Use of fire extingu-isher	Minor mechanics for vehicle	Preventive mainten-ance	Defensive driving	How to complete logbook
MCH specialty clinics	6	83%	17%	1	100%	100%	0%	0%	0%	0%	0%	100%	100%	100%	0%	100%
Higher clinics	5	80%	0%	0												
Managing authority																
Public/government	586	93%	7%	41	70%	93%	54%	51%	39%	41%	27%	80%	29%	34%	22%	29%
Private-for-profit	59	95%	14%	8	88%	75%	63%	38%	50%	50%	50%	100%	50%	50%	50%	50%
Private-not-for-profit[1]	38	92%	18%	7	86%	100%	57%	14%	71%	14%	14%	86%	86%	71%	43%	57%
Location																
Urban	469	93%	9%	44	75%	89%	52%	36%	43%	39%	20%	84%	43%	46%	34%	43%
Rural	214	93%	6%	12	75%	100%	67%	75%	50%	42%	58%	83%	25%	25%	8%	8%

[1] Includes NGO, faith-based, or mission facilities.

Table 12.1.2A: Percent of facilities with a MWH/room that received support, and source and kind of support received, by facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with a MWH/room	**Any support received**	**Source of support received**					**Kind of support received**				
			Faith-based organization	Comm-unity	Facility	NGO	Other	Construction of infrastructure	Maint-enance	Furniture	Food	Other
National	2,001	99%	6%	82%	39%	63%	0%	81%	65%	83%	87%	2%
Facility type[1]												
General hospitals	15	100%	27%	20%	53%	73%	0%	87%	87%	100%	80%	0%
Primary hospitals	43	100%	16%	47%	47%	81%	0%	81%	63%	86%	70%	5%
Health centres	1,943	99%	6%	84%	39%	63%	1%	81%	65%	83%	88%	2%
Managing authority[2]												
Public/government	1,984	99%	6%	83%	39%	63%	1%	81%	65%	83%	87%	2%
Private-not-for-profit[3]	17	94%	59%	47%	24%	71%	0%	88%	75%	88%	75%	0%
Location												
Urban	724	99%	7%	79%	40%	64%	0%	81%	66%	85%	85%	2%
Rural	1,277	99%	6%	84%	39%	63%	1%	81%	65%	82%	88%	2%

MWH = maternity waiting home.

[1] No referral/specialized hospitals, MCH specialty centres, MCH specialty clinics, or higher clinics reported a MWH/room; thus, they do not appear in the table.

[2] No private-for-profit facility reported a MWH/room; thus, they do not appear in the table.

[3] Includes NGO, faith-based, or mission facilities.

Table 12.2.1A: Percent distribution of facilities with a MWH/room according to capacity and other characteristics, by facility type, managing authority, and location, Ethiopia EmONC, 2016

		Facility type[1]		Managing authority[2]		Location	
	National	General/ primary hospitals	Health centres	Public/ government	Private-not-for-profit[3]	Urban	Rural
	n=2,001	n=58	n=1,943	n=1,984	n=17	n=724	n=1,277
Number of rooms							
1	55%	43%	55%	55%	35%	52%	56%
2	25%	24%	25%	25%	41%	27%	24%
≥3	20%	33%	20%	20%	24%	21%	20%
Capacity (mean)							
Maximum number of women	7	11	7	7	13	8	7
Number of occupants at time of visit	2	5	2	2	4	2	2
Sleeping space shared (% yes)	45%	34%	46%	46%	12%	51%	42%
	n=907	n=20	n=887	n=905	n=2	n=368	n=539
Means of privacy available (% yes)	11%	5%	11%	11%	0%	11%	10%
Sleeping conditions							
Mattress on a bed	58%	74%	58%	58%	82%	60%	57%
Mattress on the floor	37%	24%	38%	38%	18%	36%	38%
Mattresses on bed and floor	2%	2%	2%	2%	0%	2%	2%
Mat on the floor	1%	0%	2%	2%	0%	2%	1%
Other	1%	0%	1%	1%	0%	1%	1%

MWH = maternity waiting home.

[1] No referral/specialized hospitals, MCH specialty centres, MCH specialty clinics, or higher clinics reported a MWH/room; thus, they do not appear in the table.

[2] No private-for-profit facility reported a MWH/room; thus, they do not appear in the table.

[3] Includes NGO, faith-based, or mission facilities.

Table 12.3.1A: Percent of facilities reporting cultural barriers to staying at a MWH/room and type of barrier, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of facilities with a MWH/ room	Facility reported that cultural barriers exist to women staying in MWHs/rooms		Cultural factors that deter women from using MWHs/rooms (among facilities reporting cultural barriers)								
		n	%	Not customary	Husband does not allow	Other family members do not allow	No one to care for children/ prepare food	Women do not perceive need	Cannot take food and facility does not provide	Transport to MWH not available	Transport to MWH is a problem	Unfamiliar environ-ment
National	2,001	1,110	55%	36%	39%	23%	55%	30%	9%	30%	25%	16%
Region												
Tigray	93	59	63%	19%	51%	32%	39%	15%	10%	37%	39%	7%
Afar	5	1	20%	100%	100%	0%	100%	0%	100%	0%	0%	0%
Amhara	631	444	70%	35%	37%	25%	64%	27%	6%	27%	23%	11%
Oromia	792	358	45%	42%	32%	19%	47%	31%	10%	36%	30%	19%
Somali	11	8	73%	50%	75%	63%	63%	50%	38%	25%	25%	38%
Benishangul-Gumuz	11	3	27%	33%	33%	0%	0%	33%	0%	33%	0%	0%
SNNP	444	233	52%	31%	49%	24%	56%	36%	12%	23%	18%	21%
Gambella	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Harari	1	0	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Addis Ababa	11	3	27%	33%	0%	0%	0%	33%	33%	0%	0%	100%
Dire Dawa	2	1	50%	0%	100%	0%	100%	100%	0%	0%	0%	0%
Facility type[1]												
General/primary hospitals	58	26	45%	23%	38%	27%	50%	8%	19%	12%	15%	12%
Health centres	1,943	1,084	56%	36%	39%	23%	55%	31%	9%	30%	25%	16%
Managing authority[2]												
Public/government	1,984	1,105	56%	36%	39%	23%	55%	30%	9%	30%	25%	16%
Private-not-for-profit[3]	17	5	29%	40%	60%	20%	60%	20%	0%	40%	20%	20%
Location												
Urban	724	388	54%	39%	39%	23%	54%	26%	10%	22%	18%	15%
Rural	1,277	722	57%	34%	39%	23%	55%	32%	8%	34%	28%	16%

MWH = maternity waiting home.

[1] No referral/specialized hospitals, MCH specialty centres, MCH specialty clinics, or higher clinics reported a MWH/room; thus, they do not appear in the table.

[2] No private-for-profit facility reported a MWH/room; thus, they do not appear in the table.

[3] Includes NGO, faith-based, or mission facilities.

Table 12.4.1A: Percent distribution of interviewed MWH/room occupants according to socio-demographic characteristics, by facility type, Ethiopia EmONC, 2016

	National		Facility type[1]			
			General/primary hospitals		Health centres	
	Number of women	Percent of women	Number of women	Percent of women	Number of women	Percent of women
Total women interviewed	993	100%	56	6%	937	94%
Age (in years)						
<18	32	3%	3	5%	29	3%
18-24	281	28%	13	23%	268	29%
25-29	240	24%	15	27%	225	24%
30-34	189	19%	14	25%	175	19%
35-39	124	12%	4	7%	120	13%
≥40	26	3%	2	4%	24	2%
No information	101	10%	5	9%	96	10%
Median age (in years)	28		28		28	
Number of living children						
0	219	22%	11	20%	208	22%
1	168	17%	10	18%	158	17%
2	153	15%	13	23%	140	15%
≥3	453	46%	22	39%	431	46%
Median number of living children	2		2		2	
Education level						
No formal education	655	66%	33	59%	622	66%
Primary (incomplete or complete)	291	29%	20	36%	271	29%
Secondary (incomplete or complete)	45	5%	3	5%	42	4%
Other	2	0%	0	0%	2	0%
Pregnancy status						
Not yet delivered	932	94%	52	93%	880	94%
Postpartum	60	6%	4	7%	56	6%

MWH = maternity waiting home.

[1] No referral/specialized hospitals, MCH specialty centres, MCH specialty clinics, or higher clinics reported a MWH/room; thus, they do not appear in the table.

Table 12.4.3A: Percent distribution of interviewed MWH/room occupants according to reason for coming to the MWH, by region, Ethiopia EmONC, 2016

	National	Region[1]				
		Tigray	Amhara	Oromia	Somali	SNNP
	n=993	n=62	n=375	n=180	n=5	n=371
Reasons for stay						
For delivery	38%	34%	34%	39%	0%	43%
Wanted to deliver in a facility or by professionals	13%	10%	7%	24%	0%	14%
To have safe, healthy delivery	10%	0%	10%	3%	40%	16%
For special help, care, or treatment	10%	18%	9%	10%	0%	9%
To prevent problems or risks	8%	13%	10%	4%	60%	5%
Wanted follow-up, check-up	7%	11%	10%	3%	0%	5%
Felt sick	4%	2%	5%	7%	0%	2%
Told to come by someone	3%	2%	2%	3%	0%	4%
For rest	3%	0%	8%	1%	0%	0%
Lived far from facility	1%	0%	1%	2%	0%	0%
Other	3%	11%	3%	2%	0%	2%

MWH = maternity waiting home.

[1] The regions of Afar, Benishangul-Gumuz, Gambella, Harari, Addis Ababa, and Dire Dawa are not included in the table as either no women from these regions were interviewed, or the region had no MWHs/rooms.

Table 12.4.4A: Percent of interviewed MWH/room occupants according to days stayed, recency of visit by a health worker, and whether she would recommend the MWH/room to others, by region, facility type, managing authority, and location, Ethiopia EmONC, 2016

	Number of women interviewed	Average number of days stayed	Recency of visit by health worker[1] (% distribution)				Recommend to others (% yes)
			Yesterday	Day before yesterday	More than 2 days ago	Never had visit	
National	993	16	74%	6%	16%	5%	97%
Region[2]							
Tigray	62	13	79%	8%	8%	5%	100%
Amhara	375	13	76%	6%	13%	4%	96%
Oromia	180	12	79%	7%	11%	3%	98%
Somali	5	28	100%	0%	0%	0%	80%
SNNP	371	20	66%	4%	24%	6%	96%
Facility type[3]							
General/primary hospitals	56	26	61%	2%	32%	5%	89%
Health centres	937	15	74%	6%	15%	5%	97%
Managing authority[4]							
Public/government	982	16	74%	6%	16%	5%	97%
Private-not-for-profit[5]	11	18	64%	0%	27%	9%	100%
Location							
Urban	342	18	68%	7%	20%	5%	96%
Rural	651	14	76%	5%	14%	5%	97%

MWH = maternity waiting home.

[1] Recency of visit was based on 974 women's responses (excluding 4 women who had arrived the day of the facility visit and 15 women who refused to answer).

[2] The regions of Afar, Benishangul-Gumuz, Gambella, Harari, Addis Ababa, and Dire Dawa are not included in the table as either no women from these regions were interviewed, or the region had no MWHs/rooms.

[3] No referral/specialized hospitals, MCH specialty centres, MCH specialty clinics, or higher clinics reported a MWH/room; thus, they do not appear in the table.

[4] No private-for-profit facility reported a MWH/room; thus, they do not appear in the table.

[5] Includes NGO, faith-based, or mission facilities.

Table 13.1.2A: Percent of woredas, zones, and regions with mechanisms for quality improvement, quality assurance, and MDSR, Ethiopia EmONC, 2016

	Woredas n=821	Zones n=72	Regions n=11
Has a quality improvement (QI) unit	52%	22%	45%
Reasons for not having a QI unit (% distribution)			n=6
No standards			50%
Not important			0%
No budget			33%
Other			17%
A quality assurance officer is available in: (% distribution)			
All facilities/woredas	28%	19%	
Some facilities/woredas	8%	14%	
No facilities/woredas	65%	67%	
Reasons why all facilities do not have a quality assurance officer	n=595		
Lack of budget	17%		
No standard for health centres	55%		
Not needed	6%		
Other	29%		
Routinely carries out quality assurance (QA) activities	84%		
Types of recognition included in QA activities	n=690		
Recognition of best performing facilities	68%		
Recognition of best performing individuals	51%		
Other	8%		
Performs QA activities related to MNH services (spontaneous responses)	n=690		
MDSR	45%		
Morbidity audit	39%		
Mother-baby friendliness of facility	31%		
Other	18%		
MDSR is implemented in: (% distribution)	n=821	n=72	n=11
All facilities/woredas/zones	71%	74%	55%
Some facilities/woredas/zones	8%	17%	27%
No facilities/woredas/zones	21%	10%	18%
How health department[1] participates in MDSR activities	n=649	n=65	n=9
Participates in maternal death reviews	66%	68%	55%
Prepares reports on death reviews	63%	71%	73%
Participates in review meetings	61%	68%	55%
Responds accordingly	55%	63%	55%
Other	3%	8%	27%
Does not participate in MDSR activities		3%	
How communities participate in QI activities in catchment facilities	n=821		
As part of community quality assurance committees	50%		
Participate in exit interviews and suggestion boxes	52%		
Other	15%		
They are not involved	9%		

MDSR = maternal death surveillance and response; QA = quality assurance; QI = quality improvement.

[1] Refers to either woreda health offices, zonal health departments, or regional health bureaus, depending on level interviewed.

Table 13.2.2A: Percent of woredas, zones, and regions with selected supervision characteristics, Ethiopia EmONC, 2016

	Woredas n=821	Zones n=72	Regions n=11
Typical composition of supervisory team for MNH services	n=803		
Nurse	91%		
Health officer	60%		
Druggist/pharmacist	33%		
Partners	20%		
Midwife	17%		
Laboratory technician/technologist	15%		
Emergency surgical officer	1%		
MD (general practitioner)	1%		
Target of supervision	n=803	n=72	n=10
Public/government facilities	96%	100%	90%
Private-for-profit facilities	14%	60%	60%
Private-not-for-profit facilities[1]	60%	79%	50%
Woreda health office			40%
Zonal health department			90%
Activities during routine supervision	n=803	n=72	n=10
Observe the work of the providers or woreda/zonal health office/department	88%	94%	70%
Discuss performance based on MNH services data	84%	81%	80%
Coach or train in identified performance gaps	62%	61%	60%
Help the facility make any decisions based on available MNH services data	63%	43%	50%
Develop a facility action plan to help improve the quality of health services	61%	47%	50%
Provide feedback to the providers	85%	76%	90%
Provide updates on administrative or technical issues related to work	58%	50%	30%
Other	5%	15%	30%
Tools used during routine supervision	n=803	n=72	n=10
Checklist to assess quality of MNH services	97%	97%	90%
Checklist to assess availability of equipment, drugs, and supplies	92%	99%	90%
	n=803	n=72	n=10
Official record of supervisory activities kept	63%	67%	80%
Average number of facilities/offices/departments visited in the last quarter	n=803	n=72	n=10
Health facilities	6	33	70
Woreda health offices		10	15
Zonal health departments			6
Provides performance-related feedback	95%	99%	73%
Method of providing performance-related feedback	n=780	n=71	n=8
Immediate (during supervisory visit)	86%	86%	100%
Written feedback via letters	92%	96%	75%
Written feedback via e-mails	2%	11%	25%
Telephone calls	28%	38%	38%
Meetings after supervisory visit	72%	63%	50%
Other	1%	7%	0%
Frequency of review meetings (% distribution)	n=780	n=71	n=8
Never	10%	13%	25%
In the last 6 months	88%	79%	63%
In the last 12 months	2%	8%	13%
More than 12 months ago	0%	0%	0%

[1] Includes NGO, faith-based, or mission facilities.

Table 13.5.2A: Percent of woredas, zones, and regions with maternity waiting home guidelines and selected characteristics for referral,[1] Ethiopia EmONC, 2016

	Woredas n=821	Zones n=72	Regions n=11
Existence of maternity waiting home guideline/policy (% distribution)			
Exists and observed by data collector	18%	15%	18%
Exists but not observed by data collector	12%	31%	27%
Does not exist	70%	54%	55%
Number of functional ambulances available in the public sector (% distribution)			
0	7%	0%	0%
1	46%	10%	0%
≥2	47%	90%	100%
Health department[2] has budget for ambulance-related costs			
Fuel for ambulances/vehicles	86%	40%	46%
Repair and maintenance for ambulances/vehicles	87%	38%	64%
Two ambulance drivers (shifting)	40%	24%	9%
Overtime fee for ambulance service (staff)	63%	43%	9%
No functional ambulances in the public sector/no information	7%	0%	0%
Direct control over ambulances			
Health department[2]	86%	28%	
Hospital liaison officer	87%	6%	
NGO/mission	40%	0%	
Other[3]	63%	67%	
No functional ambulances in the public sector/no information	7%	0%	

[1] Non-response varies across items and is less than 1%. Non-responses are excluded.

[2] Refers to either woreda health offices, zonal health departments, or regional health bureaus, depending on level interviewed.

[3] Includes Red Cross Society and health centres for both for woredas and zones.

Table 13.6.1A: Percent of woredas, zones, and regions with infrastructure and management systems for drugs and supplies, and whether and why stock outs occurred in the last 3 months,[1] Ethiopia EmONC, 2016

	Woredas n=821	Zones n=72	Regions n=11
Medical store/warehouse available	79%	68%	64%
Major supplier for drugs and supplies (% distribution)			
Regional or zonal supplier	87%	54%	64%
Private pharmacy	1%	0%	0%
NGO/mission	0%	0%	0%
Other[2]	12%	46%	36%
Alternative source of drugs and supplies exists in case of shortage from principal supplier[3]	74%	67%	78%
Reasons for no alternative source of drugs and supplies	n=211	n=24	n=2
Not allowed by system	51%	71%	50%
No known alternative supplier	33%	13%	50%
Lack of budget	22%	8%	0%
Other	4%	8%	0%
Stock outs of any essential MNH drugs occurred in last 3 months[4]	59%	57%	50%
Stock outs of selected[5] essential MNH drugs occurred in last 3 months	n=481	n=41	n=5
Magnesium sulphate	12%	22%	36%
Oxytocin	8%	4%	0%
Amoxicillin	2%	1%	9%
Primary reason for stock outs (% distribution)	n=481	n=41	n=5
Delayed request from woreda/zone/region	9%	7%	0%
Delayed delivery from supplier	79%	66%	100%
Other	13%	27%	0%
Most common cause of delay in delivery of supplies (% distribution)			
Stock out at central or regional store	41%	21%	20%
Inadequate transport	19%	15%	30%
Administrative difficulties	17%	17%	10%
Financial problems	5%	4%	0%
Other	6%	8%	10%
No delays experienced	13%	35%	30%

[1] Non-response varies across items and is less than 1% unless otherwise noted. Non-responses are excluded.

[2] Includes the Pharmaceuticals Fund and Supply Agency (PFSA), among other responses.

[3] Non-response was 18% for regions (2 regions missing). Non-responses are excluded.

[4] Non-response was 9% for regions (1 region missing). Non-response is excluded.

[5] Respondents were asked, "What were the 3 major essential MNH drugs and supplies that experienced a stock out in the last 3 months?" The 3 most frequently mentioned drugs at woreda level were selected for inclusion in this table. Depo-Provera was also in the top 3 for zones and regions, mentioned by 7% and 9% of respondents, respectively.

Appendix B: Minimum required drugs, equipment, and supplies for determining readiness to perform the signal functions

Signal Function	Minimum Required Drugs, Equipment, and Supplies
Antibiotics	*Hospitals/MCH specialty centres:* Ampicillin AND (metronidazole OR clindamycin) AND gentamicin -OR- Ceftriaxone AND (clindamycin OR metronidazole) AND gentamicin NOTE: Chloramphenicol was not asked about in the questionnaire, so a third possible combination is not included here. *Health centres/clinics:* Ampicillin AND gentamicin -OR- Ceftriaxone AND gentamicin NOTE: Ceftazidime was not asked about in the questionnaire, so a third possible combination is not included here.
Oxytocics	Oxytocin -OR- Ergometrine (injection)
Anticonvulsants	Magnesium sulphate (any concentration) -OR- Diazepam
Manual removal of placenta	Long sleeve gloves (elbow length OR disposal exam gloves)
Removal of retained products	MVA/EVA equipment: [Complete MVA kit OR (electric aspirator AND dilators) OR (vacuum aspirator AND lubricant AND various sized cannulae)] AND local anaesthesia -OR- D&C equipment: (Sharp curettes OR blunt curettes) AND uterine dilators AND local anaesthesia
Assisted vaginal delivery	Functioning vacuum extractor AND different size cups -OR- Forceps

Resuscitate newborn with bag and mask	Ambu bag and masks (0 or 1) AND suction equipment (mucus extractor OR suction aspirator OR mucus trap)
Obstetric surgery/ caesarean	Functioning anaesthesia machine AND (halothane OR ketamine) -OR- Regional anaesthesia (ligno/lido 4% OR bipuvicaine) -AND- Functioning oxygen cylinders AND operating table AND functioning adjustable light
Blood transfusion	*All facilities:* Reagents for blood typing/cross matching AND functioning refrigerator for blood bank *Facilities that indicated their source of blood is not the central blood supply (therefore it must be direct donation or a facility blood bank):* Items listed above AND empty blood bags AND microscope AND blood tests for Hep B, Hep C, HIV, and syphilis
Antibiotics for preterm premature rupture of membranes (pPROM)	Ampicillin (injection) -OR- Erythromycin AND (ampicillin OR gentamicin)
Antibiotics for neonatal infections	Gentamicin AND (ampicillin (injection) OR benzylpenicillin) AND amoxicillin (oral)
Kangaroo mother care (KMC)	KMC guidelines AND bed for KMC (designated for KMC OR for postpartum recovery)
Antenatal corticosteroids	Betamethasone -OR- Dexamethasone
Administer oxygen to newborns	Oxygen source (in maternity OR neonatal corner)
Administer IV fluids to newborns	IV giving set for newborn OR IV infusion stand -AND- Syringes (0.5/1.0) AND IV cannula (24 gauge) AND IV fluid (normal saline)

Sources:

Health centres

Drug Administration and Control Authority (DACA) of Ethiopia. (2010). Standard Treatment Guideline for Health Centers (2nd ed.). Addis Ababa: DACA.

Primary hospitals

Food, Medicine and Health Care Administration and Control Authority (FMHACA) of Ethiopia. (2014). Standard Treatment Guideline for Primary Hospital (3rd ed.). Addis Ababa: FMHACA.

Drug Administration and Control Authority (DACA) of Ethiopia. (2010). Standard Treatment Guideline for Primary Hospitals (2nd ed.). Addis Ababa: DACA.

General hospitals

Food, Medicine and Health Care Administration and Control Authority (FMHACA) of Ethiopia. (2014). Standard Treatment Guideline for General Hospital (3rd ed.). Addis Ababa: FMHACA.

Drug Administration and Control Authority (DACA) of Ethiopia. (2010). Standard Treatment Guideline for General Hospitals (2nd ed.). Addis Ababa: DACA.

Note regarding sources: For hospitals, the 2014 guidelines specify the required antibiotics for septic abortion (though not for puerperal sepsis), and this is the combination of antibiotics we use to determine hospital readiness. This combination of antibiotics includes the regimen recommended for treatment of puerperal sepsis in hospitals provided by the 2010 guidelines. Health centre guidelines in 2014 mention simply "triple antibiotic regime" for septic abortion, though do not name specific antibiotics. For health centres, therefore, we use the antibiotics included in the 2010 guidelines for treatment of sepsis at health centres. Neither the 2014 nor the 2010 guidelines for health centres provide guidance for antibiotic regimen for puerperal sepsis, specifically.

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