

Current Set of Emergency Obstetric Care (EmOC) Indicators:
From “Monitoring emergency obstetric care: A Handbook” (WHO, 2009)

Indicator Brief #4:
Met need for EmOC

INDICATOR	ACCEPTABLE LEVEL
1. Availability of EmOC: basic & comprehensive facilities	At least 5 EmOC facilities (including at least 1 comprehensive facility) for every 500,000 population
2. Geographic distribution of EmOC facilities	All subnational areas have at least 5 EmOC facilities (including at least 1 comprehensive facility) for every 500,00 population
3. Proportion of all births in EmOC facilities	Minimum acceptable level to be set locally
4. Met need for EmOC: proportion of women with major direct obstetric complications who are treated in EmOC facilities	100% of women estimated to have major direct obstetric complications are treated in EmOC facilities
5. Caesarean sections as a proportion of all births	The estimated proportion of births by caesarean section in the populations is not less than 5% or more than 15%
6. Direct obstetric case fatality rate	The case fatality rate among women with direct obstetric complications in EmOC facilities is less than 1%
7. Intrapartum and very early neonatal death rate	Standards to be determined
8. Proportion of maternal deaths due to indirect causes in EmOC facilities	No standard can be set

Indicator 4: Met Need for EmOC

Are all women with major direct obstetric complications receiving EmOC services?

Background

Direct obstetric complications cause approximately 75% of maternal deaths worldwide.¹ Providing EmOC services, or treatment for women with the major direct obstetric complications, is the key action that must be taken to prevent these maternal deaths.² The met need for EmOC indicator was therefore developed to help program planners and policymakers track to what extent EmOC services were being delivered to and used by women with obstetric complications. This indicator was included in the 1997 “Guidelines for Monitoring the Availability and Use of Obstetric Services”³ and was maintained with no changes but with additional guidance in the revised 2009 “Monitoring Emergency Obstetric Care – A Handbook.”⁴

Definition and calculation of the indicator^a

“Met need for EmOC” is an estimate of the proportion of all women with major direct obstetric complications who are treated in facilities that have achieved either basic EmOC or comprehensive EmOC classification status. The direct obstetric complications included in this indicator are: hemorrhage (antepartum and postpartum), prolonged and obstructed labor, postpartum sepsis, complications of abortion, severe pre-eclampsia and eclampsia, ectopic pregnancy and ruptured uterus.

Numerator: Number of women treated for direct obstetric complications in EmOC facilities in a specified time period and area.

Denominator: Expected number of women with direct obstetric complications (15% of expected births) in the specified period and area.

The minimum acceptable level is 100% of women with direct obstetric complications treated in EmOC facilities.

Guidance in the 2009 Handbook recommends that this indicator be calculated for EmOC facilities as well as for all facilities.

Interpreting the indicator

This indicator is used to understand whether EmOC services are being delivered to and used by women with obstetric complications. This indicator goes beyond the first indicator which tells us whether EmOC services are available and the third indicator which shows whether women are delivering in EmOC facilities; this makes the connection between the EmOC services and the women with complications who need to use the services.

This indicator was developed to raise the following red flags:

- If met need for EmOC is low (i.e., less than 100% and not meeting the benchmark), it indicates that:
 - Not enough women with obstetric complications are accessing and using EmOC services and/or
 - Not enough health facilities are providing EmOC services and/or
 - Providers are not identifying obstetric complications and/or
 - Data quality may be poor (issues around accuracy, completion, over/under-reporting)

How this indicator can be used

- Met need for EmOC is typically included in national and sub-national EmOC assessments. Results are used by governments and other implementers to identify gaps in EmOC provision and utilization, to plan and prioritize interventions, and to monitor change over time.
- Met need for EmOC can also be used to track progress of programs that are designed to improve EmOC services in specific groups of facilities, such as facilities that are part of EmOC networks.

Assumptions

- The intent of this indicator is not as a proxy for measuring maternal mortality; it is to function as a tool for identifying problems and spurring further action to improve program planning and implementation.
- Obstetric complications, which are collected for the numerator, are accurately and consistently recorded in health facility registers and/or other patient records and are easily extracted.
- The women with obstetric complications recorded in registers received definitive treatment.
- The estimated need for EmOC in all populations, the denominator of this indicator, is 15% of expected births.^a
- Met need for EmOC does not tell us about whether the woman was adequately treated. When an obstetric complication is recorded in a register, we know nothing about the quality of care the woman received or whether she was definitively treated at the facility.^b
- If more health facilities provide lifesaving services, and service data are well collected, then met need for EmOC should increase, showing that the health system is better serving women with obstetric complications.

Methodological issues

Issues related to the numerator:

- To calculate met need, information is needed on the number of women who are treated for the major obstetric complications listed above. In the 2009 Handbook, definitions of the direct obstetric complications derived from WHO^{20–22} and the International Federation of Gynaecology and Obstetrics Save the Mothers Project were included to standardize data collection (Figure 1). Yet, in many places the recording of complications is still not standardized.
- The indicator is not currently aligned with ICD-11 categories that are in use in some countries, but it would not be difficult to align them in the future (Table 1).
- Routine maternity record systems in many countries do not include a place to record maternal obstetric complications. Even when there is a place to record complications, what is written is not standardized, which can lead to undercounting of certain complications and overcounting of others.
- The way that abortion complications are recorded is highly variable, including inaccuracies regarding severity, e.g. whether the abortion was only incomplete (which could lead to a complicated abortion) or truly complicated (with hemorrhage or sepsis). In some places, there is no distinction in severity in the

^a This estimate was developed based on the best evidence available in 1997. When the indicators and accompanying guidance were revised in 2009, the technical consultation reviewed the evidence and decided to maintain 15% as a global estimate of the number of women who develop direct obstetric complications.

^b However, another indicator in the set, direct obstetric case fatality rate, is a useful companion to met need. The case fatality rate looks at the proportion of women treated for direct obstetric complications who die before discharge and can provide a crude sense of the quality of care delivered.

records and therefore severe complications of abortion may be over-reported. Because of these issues in reporting, it is important to explain what types of abortions are likely to be included in the numerator when presenting data. The 2009 Handbook recommended calculating and reporting met need with and without abortions for comparison.

- When a woman has more than one obstetric complication documented, the more serious / life-threatening direct obstetric complication is supposed to be counted (i.e., the indicator is meant to only capture whether a woman is treated for any complication, not for all complications). But, it is possible that sometimes multiple complications per woman are included.
- When women with obstetric complications receive some treatment at one facility and are referred to another facility for definitive treatment^c, the 2009 Handbook recommended that these women be counted at the facility at which the women received definitive treatment. However, sometimes referrals are difficult to track and it is possible that some women with complications are counted twice.

Figure 1: Operational definitions of major direct obstetric complications

<p>Haemorrhage <i>Antepartum</i></p> <ul style="list-style-type: none"> Severe bleeding before and during labour: placenta praevia, placental abruption <p><i>Postpartum</i> (any of the following)</p> <ul style="list-style-type: none"> Bleeding that requires treatment (e.g. provision of intravenous fluids, uterotonic drugs or blood) Retained placenta Severe bleeding from lacerations (vaginal or cervical) Vaginal bleeding in excess of 500 ml after childbirth More than one pad soaked in blood in 5 minutes
<p>Prolonged or obstructed labour (dystocia, abnormal labour) (any of the following)</p> <ul style="list-style-type: none"> Prolonged established first stage of labour (> 12 h) Prolonged second stage of labour (> 1 h) Cephalo-pelvic disproportion, including scarred uterus Malpresentation: transverse, brow, or face presentation
<p>Postpartum sepsis</p> <ul style="list-style-type: none"> A temperature of 38 °C or higher more than 24 h after delivery (with at least two readings, as labour alone can cause some fever) plus any one of the following signs and symptoms: lower abdominal pain, purulent, offensive vaginal discharge (lochia), tender uterus, uterus not well contracted, history of heavy vaginal bleeding. (Rule out malaria)
<p>Complications of abortion (spontaneous or induced)</p> <ul style="list-style-type: none"> Haemorrhage due to abortion which requires resuscitation with intravenous fluids, blood transfusion or uterotonics Sepsis due to abortion (including perforation and pelvic abscess)
<p>Severe pre-eclampsia and eclampsia <i>Severe pre-eclampsia</i></p> <ul style="list-style-type: none"> Diastolic blood pressure $\geq$ 110 mm Hg or proteinuria $\geq$ 3 after 20 weeks' gestation. Various signs and symptoms: headache, hyperflexia, blurred vision, oliguria, epigastric pain, pulmonary oedema <p><i>Eclampsia</i></p> <ul style="list-style-type: none"> Convulsions; diastolic blood pressure $\geq$ 90 mm Hg after 20 weeks' gestation or proteinuria $\geq$ 2. Signs and symptoms of severe pre-eclampsia may also be present
<p>Ectopic pregnancy</p> <ul style="list-style-type: none"> Internal bleeding from a pregnancy outside the uterus; lower abdominal pain and shock possible from internal bleeding; delayed menses or positive pregnancy test
<p>Ruptured uterus</p> <ul style="list-style-type: none"> Uterine rupture with a history of prolonged or obstructed labour when uterine contractions suddenly stopped. Painful abdomen (pain may decrease after rupture of uterus). Patient may be in shock from internal or vaginal bleeding

^c 'Definitive treatment' is defined as clinical care provided to a woman resulting in her discharge or death.

Table 1: Direct obstetric complications in the 2009 Handbook compared to the ICD-11 classifications²³

Direct obstetric complications in 2009 Handbook	ICD-11 classifications
Ectopic pregnancy	JA01 Ectopic pregnancy
Complications of abortion	JA05 Complications following abortion, ectopic or molar pregnancy
Antepartum hemorrhage	JA41 Antepartum haemorrhage
Postpartum hemorrhage	JA43 Postpartum haemorrhage
Severe pre-eclampsia	JA24.1 Severe pre-eclampsia
Eclampsia	JA25 Eclampsia
Obstructed labor	JB04 Obstructed labour due to malposition or malpresentation of fetus JB05 Obstructed labour due to maternal pelvic abnormality JB06 Obstructed labour due to other causes
Prolonged labor	JB03 Long labour
Ruptured uterus	JB0A.0 Rupture of uterus before onset of labour JB0A.1 Rupture of uterus during labour
Postpartum sepsis	JB40.0 Puerperal sepsis

Issues related to the denominator:

- There has been considerable discussion about the expected number of complications and whether 15% is too low, too high, if it varies in different parts of the world, or if it has changed over the years.
 - o New/more widely used clinical and management practices help prevent some direct obstetric complications (e.g., active management of the 3rd stage of labor, depending on clinical components used and route of oxytocin, reduced the risk of postpartum hemorrhage by 66-76%²⁴). However, the incidence of complications is still likely to be no less than 15%:
 - Few population-based studies look at the prevalence of direct obstetric complications; however, one recent study by Aftab et al (2021)⁹ estimated that 32.7% of pregnancies (n=114,050 pregnant women in eight countries in South Asia and sub-Saharan Africa) had at least one major direct maternal morbidity. However, their study excluded complications occurring in the first and second trimesters (i.e., complications of abortion, ectopic pregnancies), relied in part on women's self-report of complications (e.g., infections), included all cases of hypertension and late third trimester antepartum infections, and relied on reports of surgical procedures performed regardless of their medical necessity (e.g., cesarean section) to record obstructed labor.
 - An older study conducted by AbouZahr (2003)⁶ estimated that 37.5% of live births resulted in a complication (i.e., severe PPH, sepsis, pre-eclampsia/eclampsia, obstructed labor, abortion).
 - Other studies on the prevalence of specific obstetric complications are hospital-based and may overestimate the number of births with obstetric complications, especially in places where many births occur outside of facilities.
 - A recent umbrella review by Boychuk et. al. (unpublished, 2021)²⁵ looked at 43 systematic reviews and meta-analyses to estimate prevalence of major direct obstetric complications. The authors found that due to variations in study design and a lack of standardized, high-quality data, it was difficult to combine estimates and therefore concluded that 15% remained a reasonable estimate.
 - Table 2, below, shows the range of different estimates for specific complications and hints at the challenges of combining estimates, particularly because of differences in study samples and methodologies.

Table 2: Incidence/Prevalence of direct obstetric complications

	Incidence/ Prevalence (%)	Notes
Complications of abortion	14.8 ⁶	Global estimate; % of live births
Ectopic pregnancy	1.1 ⁷	Estimated prevalence in the UK
	1-2 ⁸	% of pregnant women
APH	2.2 ⁹	South Asia and sub-Saharan Africa; % of pregnancies
	2-5 ¹⁰	% of pregnancies progressing beyond 24 weeks
Severe PPH	1.7 ⁹	South Asia and sub-Saharan Africa; % of pregnancies
	10.5 ⁶	Global estimate; % of live births
	5 ¹¹	
Severe pre-eclampsia	4.6 ¹²	% of all deliveries
	2-8 ^{13,14}	% of all pregnancies
	1.2-9.5 ¹⁵	Pregnant women in 13 HICs & 1 LICs
	4.1 ¹⁶	Pregnant /postpartum women in sub-Saharan Africa
	2.6 ¹⁷	Pregnant women in China
Eclampsia	1.4 ¹²	% of all deliveries
	1.5 ¹⁶	Pregnant /postpartum women in sub-Saharan Africa
Pre-eclampsia/ eclampsia	1.4 ⁹	South Asia and sub-Saharan Africa; % of pregnancies
	3.2 ⁶	Global estimate; % of live births
Obstructed/ prolonged labor	11.1 ⁹	South Asia and sub-Saharan Africa; % of pregnancies
Obstructed labor	4.6 ⁶	Global estimate; % of live births
Ruptured uterus	0.053 (median), range 0.016–0.30 <i>[community-based studies]</i> 0.31 (median), range 0.012–2.9 <i>[facility-based studies]</i> 1% <i>[women with previous caesarean section]</i> ¹⁸	% of pregnant women; prevalence was higher in countries defined by the UN as 'least developed'
Postpartum sepsis	8.6 ⁹	South Asia and sub-Saharan Africa; % of pregnancies
	4.4 ⁶	Global estimate; % of live births
	.05 (sepsis) and 1.1 (maternal peripartum infection) ¹⁹	Global incidence
Total	32.7 ^{#,9}	South Asia and sub-Saharan Africa; % of pregnancies
	37.5 ^{*,6}	Global estimate; % of live births

[#] % of pregnancies with at least one major direct maternal morbidity; includes cases of hypertension only and late 3rd trimester antepartum infections; excludes ectopic pregnancies and complications of abortion.

^{*} Sum of severe PPH, sepsis, pre-eclampsia/eclampsia, obstructed labor and abortion.

- The population figures and crude birth rate used to calculate the expected number of births – the base for the expected number of complications – have their flaws (e.g., population projections based on old censuses, crude birth rate variations within countries).

Issues related to interpretation:

- Calculating met need at the national level is the most straightforward way to interpret the indicator. If you can count the complications managed at all public and private sector facilities that manage a certain number of deliveries per year and calculate the expected number of obstetric complications based on the national population and crude birth rate, assuming complications are well recorded in registers, you should have a strong national estimate of met need for EmOC. However, it can also be useful to look at met need for EmOC for certain sub-sets of the population, such as women with complications being treated only in public sector facilities or women living in specific sub-national areas. In these cases, the denominator must be adjusted to match the area in which included facilities are located and the indicator must be interpreted accordingly. Interpreting met need for EmOC can be more challenging when not all facilities in an area are included, like in a network of facilities, or for single facilities' catchment areas.
- In many places with focused EmOC implementation support, data quality often improves. So increases in met need may reflect improved recording of complications and not just higher use of EmOC services. The 2009 Handbook recommended special studies for a better understanding of what is driving the increase.

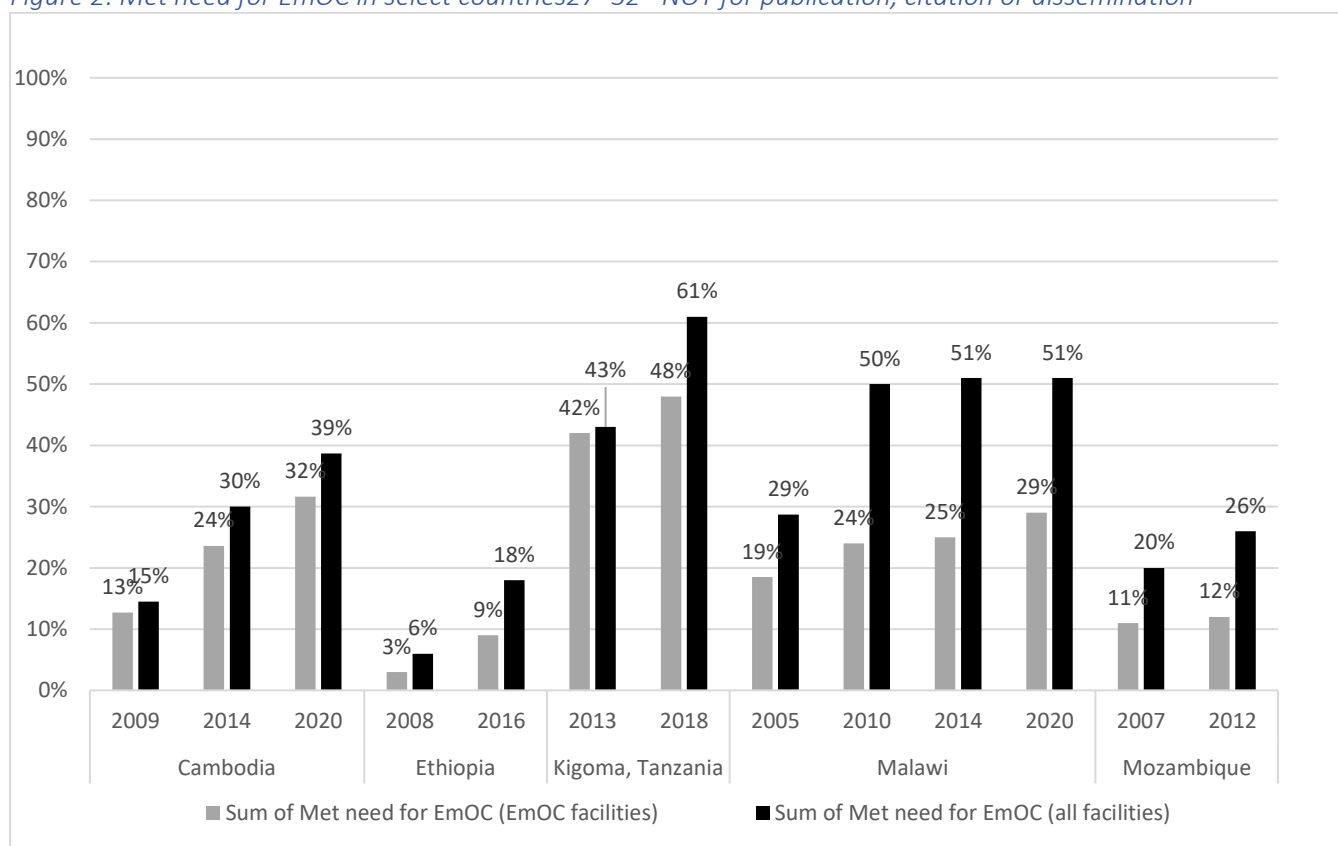
Lessons learned from experience with the indicator: EmONC assessments

- Met need for EmOC has been calculated in all EmOC assessments to date. However, it remains an underused indicator in national and global level planning and policy discussions. This is most likely because people do not have a clear understanding of its utility. When the indicator appears in reports it is often accompanied by caveats that can undermine its value and reduce people's confidence in the indicator (e.g., challenges to standardized definitions, poor quality data, complications extracted from a sample of facilities and not a census, etc.) It is, therefore, important to clearly explain what actionable information is gained when presenting met need for EmOC, such as: showing areas where few women with obstetric complications are presenting at EmOC facilities vs. non-EmOC facilities and showing if progress has been made in EmOC utilization over time. These types of findings are useful for planning and prioritization despite any measurement challenges.
- Holmer et al (2014)²⁶ extracted met need for EmOC from 51 countries and estimated that the global met need for EmOC was 45%. They found that met need for EmOC ranged by income level of countries: low-income countries had the lowest met need (21%), middle-income countries had slightly higher met need (28-51%), and high-income countries had the highest met need (99%).
- Comparisons of urban and rural regions tend to show dramatic variation in met need. For example, in Ethiopia's 2018 national assessment, Addis Ababa had a met need of 83% whereas the rural region of Gambella had a met need of only 3%. This may suggest that urban women had easier access to and higher use of services. Alternatively, it may indicate that women from more rural, underserved areas are being referred to areas that are perceived to have better health services, or that women are choosing to bypass local facilities to give birth elsewhere (probably a small % but if they have family in an urban setting?). A third possibility points to variation in the quality of complication recording.
- As discussed above, methodological issues around complications of abortion and how they are recorded in registers can impact met need. One example comes from Ethiopia. In the 2016 Ethiopia assessment, when non-severe abortion complications were included, met need increased from 18% to 29% in all facilities and from 9% to 15% in EmOC facilities. By adding all postabortion complications to the

calculation of met need we gain a fuller picture of women's use of services and the ability of the health system to respond to abortion complications.

- In a number of countries, we are able to track progress of met need for EmOC over time through repeated EmONC assessments (Figure 2):
 - o **In Cambodia** over 11 years, there was a 149% increase in met need in EmOC facilities and 167% increase in all facilities. While the sample of facilities changed between 2009 (n=347 facilities, including 40 private facilities) and 2020 (n=210 facilities that make up the EmONC network, with no private facilities), we see the public sector increasing their treatment of women with obstetric complications. However, with 39% as the met need for EmOC in all facilities in 2020, we are left to wonder what is happening with the over 60% of women with complications. Were they receiving treatment at facilities not included in the EmONC assessment, particularly private facilities, or were they not receiving any treatment at any health facility? Report authors hypothesized that met need would greatly increase if private facilities were included in the EmONC network.²⁷
 - o **In Ethiopia** over eight years, there was a 200% increase in met need in both EmOC facilities and all facilities. Despite the increase, in 2016, more than 80% of women with obstetric complications were still not receiving EmOC services in facilities.²⁸
 - o **In Kigoma, Tanzania** over 5 years, met need for EmOC increased by 14% in EmOC facilities and by 42% in all facilities. At 61%, Kigoma has the highest met need for EmOC in the group of countries presented. Study authors believe the increase in met need for EmOC was due to over a decade of investment in improving quality and access to EmOC services in the region. They also believe that recording of complications in facility registers increased over time given the heavy program monitoring that was carried out alongside program implementation.²⁹
 - o **In Malawi** over 15 years, met need for EmOC increased by 57% in EmOC facilities and by 78% in all facilities. However, progress in recent years has slowed. Between 2014 and 2020, met need in EmOC facilities only increased by 16% and stalled in all facilities. Authors of the 2020 report believe that many obstetric complications were not recorded in registers and that met need for EmOC is likely to be underestimated. But yet, at 51%, met need for EmOC in Malawi is higher than in many other countries.³⁰
 - o **In Mozambique** over five years, met need for EmOC increased by one percentage point (9%) in EmOC facilities and by 6 points (30%) in all facilities. Met need in Mozambique in 2012 was very low (26%) with nearly three-quarters of women with obstetric complications not receiving treatment in health facilities. The report authors state their concern about the quality of data recorded in facility registers and that met need is likely to be underestimated. But, with many parts of the country having poor access to EmOC services, many women with complications are probably not receiving the treatment that they require.^{31,32}
- While many countries find it challenging to reach 100% met need for EmOC, improvements in this indicator can be motivational for planners and implementers as it connects service improvements with an increasing number of women benefiting from EmOC services. At the same time, deficits in met need for EmOC point towards the need for more investment and implementation support to ensure that progress continues. It can also highlight the need to investigate why more women with complications are not reaching facilities. Perhaps more EmOC services are needed in some places or maybe women with complications are not reaching facilities. More clues about what is needed comes from looking at this indicator along with the other indicators in the set.

Figure 2: Met need for EmOC in select countries27–32– NOT for publication, citation or dissemination



Cambodia, 2020: n=181 facilities previously selected after 2009 to be part of a national EmONC network plus 29 facilities being targeted for upgrade; all public facilities.

Ethiopia, 2016: n=3,804 facilities; all facilities that provided delivery services in 2015; public and private, restricted to health centers and hospitals and their private equivalents.

Kigoma, Tanzania, 2018: n=197 facilities; all facilities conducting deliveries; public and private.

Malawi, 2020: n=482 facilities; all facilities conducting at least 15 deliveries per month; public and private.

Mozambique, 2012: all facilities with a maternity unit.

Going forward – thoughts and recommendations

- We recommend keeping this indicator in the set.
- For countries using the ICD-11 classifications in their HMIS systems, guidance should be provided on how to harmonize classifications and definitions of complications for the calculation of met need.
- In the absence of more high-quality population-based studies on the prevalence of direct obstetric complications, we recommend keeping 15% as an estimate of expected obstetric complications in the population.
- Along with updated guidance on met need for EmOC's usefulness and interpretation, better communication strategies must be developed to demonstrate the indicator's utility for planning and tracking progress.
- Since met need for EmOC does not tell us anything about the quality of clinical management, appropriateness of care or patient experiences, we hope that other new indicators in the revised set will be useful complements. For example, in the future, it will be useful to compare met need for EmOC for

facilities that provide EmONC and have high readiness scores with those that are performing EmONC but have low readiness scores.

- Stratifying met need for EmOC by various characteristics at either the facility level (e.g., ownership, geographical location) or at the individual patient level (e.g., residence, age, ethnicity, wealth quintile) may also be useful to learn more about who is using EmOC services and who is not.
- A potential new indicator that could be added to the set (as elaborated) could be the proportion of women with complications at facilities who are referred out. This would show how many women with complications are not able to receive definitive treatment at facilities where they are presenting. It would also give credit to those facilities who are identifying women with complications that are not treatable at that level who are then referring them to higher level care. The calculation of this indicator would be possible in places where maternity registers specifically indicate whether a woman with complications was definitely treated or was referred to another facility. Alternatively, to learn more about facilities that are not able to provide definitive care for women with complications, we may consider including guidance on how to conduct a special study that looks at: a) the number of women with complications that are identified and then referred; b) the number of women with complications who are stabilized and then referred; and c) the number of women who received definitive care (what is currently included in the calculation of met need).
- Finally, we recommend exploring the possibility of a parallel indicator on met need for small or sick newborn care.

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