

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

Indicator Brief #2:
Geographic distribution of EmOC facilities

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 2: Geographical Distribution of Emergency Obstetric Care (EmOC) facilities (GDEF)

This brief was written to describe the above indicator, the assumptions behind the indicator, methodological issues that have arisen since it was included in *The Handbook*¹, what we have learned in the 10+ years since the indicator was first described and a few ideas related to the indicator as we go forward.

Background

In view of the urgency of obstetric complications, EmOC services must be distributed throughout a country so that women can reach them. If facilities are clustered around a capital city or only in large urban centers, women in more remote regions risk experiencing delays in getting treatment, which might threaten their survival and the survival of their newborns, or result in morbidities (e.g., obstetric fistula).

The geographical distribution of EmOC facilities (GDEF) indicator was proposed to “[take] into consideration the geographical distribution and accessibility of facilities [and to] help programme planners to gather information about equity in access to services at subnational level.” It was intended as a way to “efficiently” check distribution of EmOC services, with a recognition that true access requires more than geographic proximity.¹

How to calculate

To calculate the GDEF indicator, one must first calculate the availability of EmOC in each subnational area (Step 1). This is done the same way as calculating the national-level EmOC availability indicator (see Indicator 1 Brief), but for subnational areas. Then, to determine the proportion of subnational areas with the minimum acceptable number of functioning EmOC facilities for their population size (Step 2), one calculates the following:

Numerator: Number of subnational areas in country meeting the minimum recommended number of EmOC facilities (at least 5 facilities per 500 000 population including at least 1 comprehensive functioning EmOC facility)

Denominator: Number of subnational areas in country

The aim is for all (100%) of the subnational areas to have the minimum acceptable numbers of functioning EmOC facilities.

Some countries choose to focus less on the aggregated indicator (Step 2), and more on the disaggregated results (Step 1), as a way to identify *which* subnational areas have deficits in EmOC availability.

Assumptions

- The density of EmOC facilities (relative to population) is correlated with maternal mortality at subnational level.

- If a subnational area has the minimum number of EmOC facilities for its population size, those facilities are well distributed within that area.
- Where the population is widely dispersed and travel difficult, it is advisable to exceed the minimum acceptable level.
- (See Indicator 1 Brief for assumptions related to calculating EmOC availability, which are also applicable to the GDEF indicator.)

Red flags that the indicator raises

The proportion of subnational areas with an adequate number of basic and comprehensive EmOC facilities provides important information on the distribution of EmOC facilities in a country. It can raise red flags with respect to geographic access and equity, which planners should take into account when determining where to situate obstetric services in the health system. If subnational geographical areas do not meet the minimum acceptable ratio, underserved areas should be targeted and resources devoted to improving the availability of services. When the value of the indicator increases, it indicates that EmOC facilities are better distributed throughout the country.

Methodological issues and critiques

(Methodological issues for determining what the minimum number of EmOC facilities should be and whether that target is met are discussed in the Indicator 1 brief.)

The GDEF indicator provides only a very basic measure of geographic distribution of facilities classified as EmOC.

The GDEF indicator measures the density of EmOC health facilities in the considered areas, but it does not provide information on their geographic distribution within the areas. They can be centralized in the same place or positioned such that they serve the majority of the population. It also does not take into account travel time, or the topology, seasonality, road networks, or modes of transportation that might affect travel time. The 2009 Handbook recognized these limitations, recommending supplementary studies using digital mapping and geographical information systems (GIS) (page 16)¹.

The indicator does not reflect geographical access to facilities across subnational areas.

Women generally go to the cheapest, nearest, or best known facility, or to one they perceive to provide good quality care, regardless of administrative boundaries. The indicator focuses on subnational administrative areas and does not reflect where women actually seek care, with some women from one subnational area seeking care or being referred to health facilities in other areas of the country.

'Equity in access' is narrowly defined.

Although the indicator's stated intent in the 2009 Handbook was to "help programme planners to gather information about equity in access to services at subnational level", "access" requires much more than geographically distributed facilities. It requires the absence of obstacles to seeking care, and the GDEF indicator does not provide any information about non-geographic barriers to seeking care, such as financial accessibility or discrimination along religious, ethnic, cultural, or other lines.

Lessons learned from the implementation of the indicator

In most high burden countries, the geographic distribution of EmOC health facilities is still inadequate. Data from EmOC assessments show that no high burden countries have reached 100% GDEF, as shown in Table 1 below.

Table 1. GDEF indicator value in a sample of country EmOC Assessments

Country	Year of EmOC Assessment	GDEF value
Ethiopia	2016	18% (analysis done at regional level)
Ghana	2011	0% (analysis done at regional and district level)
Ghana	2020	0% (analysis done at regional level)
Malawi	2020	11% (analysis done at district level)
Mozambique	2012	0% (analysis done at regional level)
South Sudan	2013	0% (analysis done at state level)
Sudan	2017	0% (analysis done at state level)
Zambia	2014-15	10% (analysis done at provincial level)

Chosen administrative units rarely align with the 500,000 population benchmark.

Despite the fact that the population scale was clearly defined (500,000 population) for measuring EmOC availability, in practice, planners in subnational areas often try to achieve the minimum recommended number of EmOC facilities regardless of their area's population size (for example, five EmOC facilities or more in districts of less than 100,000 people). This can lead to a misalignment between the administrative scale used for planning and the 500,000 population scale used for the benchmark, and can result in unrealistic EmOC planning.

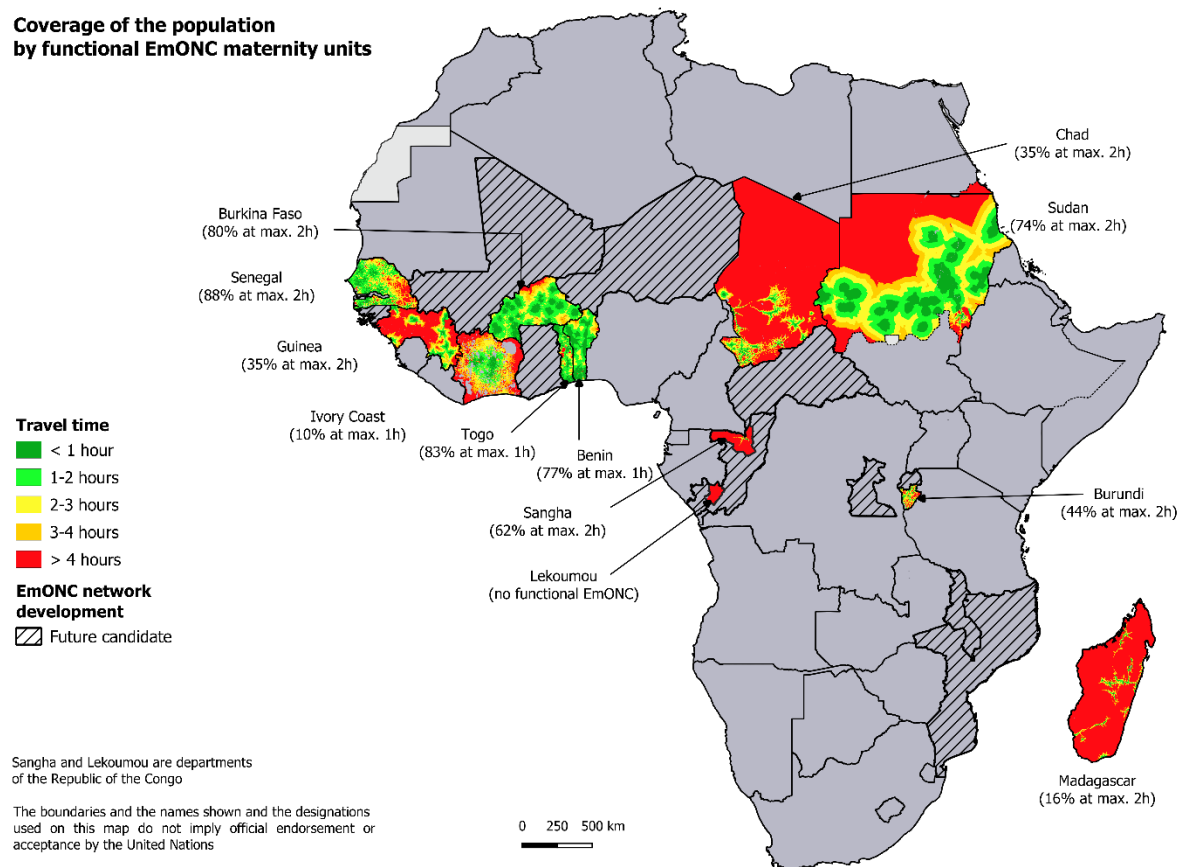
Looking forward – thoughts and recommendations

Over the last decade, the increasing use of GIS by countries has demonstrated the added value of indicators measuring the geographic accessibility to health services. Given the limitations described above, the GDEF indicator should evolve towards an EmONC population coverage indicator and measure “the proportion of population able to access an EmONC facility within X hour travel time”.

In a 2018 paper, Ebener et al⁸ propose three geographically explicit indicators to complement the standard set promoted by the international health community for monitoring timely physical access to EmONC: proportion of pregnant women able to access 1) an EmONC facility or 2) a CEmONC facility within a given travel time; or 3) an indicator to measure travel time for referrals from BEmONC to CEmONC facilities. The paper states that adopting the proposed geographically explicit measurements would allow policy makers to monitor timely physical access to essential health care, highlight inequities among the population in terms of travel time, and address system barriers on the road to reaching Universal Health Coverage and the Sustainable Development Goals.

Indicators such as these have already been implemented by 13 countries with UNFPA support. They allow the production of population coverage statistics and national physical accessibility maps, such as Map 1 below. These coverage statistics and maps have been critical to optimizing the national network of EmONC health facilities in these countries by finding a balance between a limited number of EmONC facilities while maintaining relatively high coverage of the population.

Map 1. Population access to the closest functional EmONC health facility in countries in sub-Saharan Africa



Converting the GDEF indicator to a GIS-based population coverage indicator would also align the revised EmONC framework with the EmOC coverage indicator proposed by Ending Preventable Maternal Mortality (EPMM 2025 target #4). Based on global stakeholder consultations and reflections, this has provisionally been defined as the proportion of the population covered by EmOC health facilities within two hours of travel time. EPMM is developing an operational note on its EmOC coverage target that aims to be finalized and tested in countries by Q4 2022.

More research and analysis should be conducted in the urban context, to better capture access issues in densely populated areas and slums, or access issues that are experienced by vulnerable groups. More research may also be needed in very sparsely populated areas, where low caseloads don't afford providers many opportunities to practice skills, thus threatening quality of care. Simulations or other skill-maintenance trainings may provide a solution to this problem.

More work should also be conducted to capture other access issues (financial, cultural, ethnic, and other barriers) to better measure equity in the provision of care in MNH.

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