The maternity was too far away, so I died!
The challenging role of realistic geographical mapping for reducing maternal mortality in Africa

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ESTIMATED TIME TO ARRIVAL  00:08:04
TIME LAPSED   04:51:54

THE WALK

http://bit.ly/the_walk_drc
Maternal mortality decreased by 50% since 1990

Maternal mortality ratio (MMR) = Maternal deaths per 100,000 live births

Maternal mortality rate (maternal deaths per 100'000 live births), 2017

South Sudan (1150; UI 789-1710)
Chad (1140; UI 847-1590)
Sierra Leone (1120; UI 808-1620)

Why do women die?

For more than 75% of the cases:
severe bleeding or infections (usually after childbirth), high blood pressure during pregnancy, complications from delivery, unsafe abortion

Associated factors:
No or few antenatal consultations
Delivery without being assisted by a trained midwife, doctor or nurse

Causes:
Poverty
Distance to facilities
Inadequate and poor quality services
Lack of information
Cultural beliefs and practices.

Geographical (physical) accessibility to adequate quality services

Source: WHO / Maternal mortality fact sheet
EmONC (Emergency Obstetric and Neonatal Care)

FIGURE 1. EmONC SIGNAL FUNCTIONS

**BASIC EmONC SIGNAL FUNCTIONS**
(B EmONC)

1. Administer parenteral antibiotics
2. Administer uterotonic drugs
3. Administer parenteral anticonvulsants
4. Perform Manually removal of the placenta
5. Remove retained products
6. Perform assisted vaginal delivery
7. Perform basic neonatal resuscitation (with bag and mask)

**COMPREHENSIVE EmONC SIGNAL FUNCTIONS**
(C EmONC)

7 BEmONC signal functions +
8. Perform Blood transfusion
9. Perform Caesarean section

Services available 24h/24 and 7d/7
EmONC situation in countries with a high burden of maternal and newborn mortality

Source: Adapted from 2016 unpublished graph by Lynn Freedman (AMDD, Columbia University) and Patricia Bailey (FHI360) based on EmONC Needs Assessments of 15 countries.
Tanahashi framework (1978)

Effective coverage
To what extent are services satisfactory from a safety and quality perspective?

Contact coverage
To what extent are services being used?

Acceptability coverage
To what extent are services affordable and culturally appropriate?

Accessibility coverage
To what extent are services within reasonable reach?

Availability coverage
What services are currently being provided and where, by whom (including both private and public sectors)?

Target population who do not use services

Geographical accessibility
how to model it?

Circle at a given distance

Accounting for movement facilitators/constraints (roads, forest, rivers, etc.), for a maximum travel time (ex: 60 minutes)
Overlay with population density

Zonal statistics
(e.g., percentage of the population within 2-hour travel time to the health service)
The travel scenario influences the catchment!

- **National road**: car, 80 km/h
- **Off-road**: cart/charrette, 15 km/h
- **Forest**: walking, 3 km/h

- **National road**: moto, 60 km/h
- **Off-road**: motorcycle, 20 km/h
- **Forest**: walking, 3.5 km/h
Buffer zone 5 km: 21'287 population

Catchment area at max. 30min travel: 57'690 population
Accessibility coverage at national scale in Togo

Travelling scenario:

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National population coverage at 120min: 83%
+ national and local expertise to inform about modes and speeds of transport of the population
AccessMod 5

Accessibility analysis
Catchment analysis
Zonal statistics
Scaling-up analysis

Referral analysis

accessmod.org
West of Rep. of Guinea

Before prioritization

108 designated EmONC
covering 89% of the population at 2 hours max travel time

After prioritization

59 designated EmONC
covering 83% of the population at 2 hours max travel time
Senegal

Priorisation 2017 (without GIS)

174 designated EmONC facilities
cover 87% of the population in
2 hour travel time

Priorisation 2017 (with GIS)

150 designated EmONC facilities
cover 91% of the population in
2 hour travel time
Burundi

Before prioritization

152 designated EmONC facilities cover 72% of the population in 2 hour travel time

After prioritization

112 designated EmONC facilities cover 68% of the population in 2 hour travel time
Similar work done in 11 countries, with UNFPA (2017-2021)

81% → 35% for functional EmONC

61% → 34% for functional EmONC

Travel time:
- < 1 hour
- 1-2 hours
- 2-3 hours
- 3-4 hours
- > 4 hours

* National network of EmONC facilities under validation by the Ministry of Health

Lekoumou and Sangha are departments of the Republic of the Congo

The boundaries and the names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
Madagascar
Another use case for UNICEF: access to health facilities in Mozambique

Cyclone Idai made landfall in Mozambique in March 2019
Pre-cyclone situation
Post-cyclone situation
Accessibility maps to the nearest functional health facility, post cyclone Idai in 2019

25% of target population lost timely access to care
ESTIMATED TIME TO ARRIVAL 00:07:02
TIME Lapsed 04:52:56
THE WALK
Thank you for your attention!

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