Assessing coverage of Community-based Management of Acute Malnutrition

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Outline

- What is coverage?
- Why is coverage important?
- Measuring coverage
- Coverage challenges

What is coverage?

Think of words or phrases that come to mind when you read or hear the term

coverage

$$\text{coverage} = \frac{\text{No. in the programme}}{\text{No. who should be in programme}}$$

Coverage and CMAM

Coverage estimators - old

$$\text{Point coverage} = \frac{C_{in}}{C_{in} + C_{out}}$$

$$\text{Period coverage} = \frac{C_{in} + R_{in}}{C_{in} + C_{out} + R_{in}}$$

where:

C_{in} = cases in the programme

C_{out} = cases not in the programme

R_{in} = recovering cases in the programme

Characteristics of estimators

- **Point coverage** assesses the programme's case-finding capabilities
- **Period coverage** assesses the programme's case-finding capabilities and its ability to retain a case from admission to cure. Always equal to or higher than point coverage (never lower)
- Period coverage more closely approximates treatment coverage or effective coverage

Bias and limitations of estimators

- Both estimators are unable to detect **cases who have died** and **recovering cases not in the programme**
- **Point coverage** can underestimate true coverage in settings where **case prevalence is low** and **majority of cases are in recovery**
- **Period coverage** can overestimate true coverage in settings where **length of stay** in programme is **prolonged**

Which estimators to use?

- **Early days of CMAM:** reported both point and period coverage estimators
- **Recent past:** recommendation has been made to report *only one* of the coverage estimators with the choice of estimator to report to be based on programme features such as length of stay and MUAC at admission among others

Coverage estimators - updated

$$\text{Case-finding effectiveness} = \frac{C_{in}}{C_{in} + C_{out}}$$

$$\text{Treatment coverage} = \frac{C_{in} + R_{in}}{C_{in} + C_{out} + R_{in} + R_{out}}$$

where:

C_{in} = cases in the programme

C_{out} = cases not in the programme

R_{in} = recovering cases in the programme

R_{out} = recovering cases not in the programme

What estimators to use?

- We now recommend that *both* estimators be reported as they describe different aspects of the programme relevant to coverage.
- **Case-finding effectiveness** gives an idea of how good the programme is in case-finding – a key factor in coverage
- **Treatment coverage** provides an approximation of true coverage or effective coverage

Why coverage?

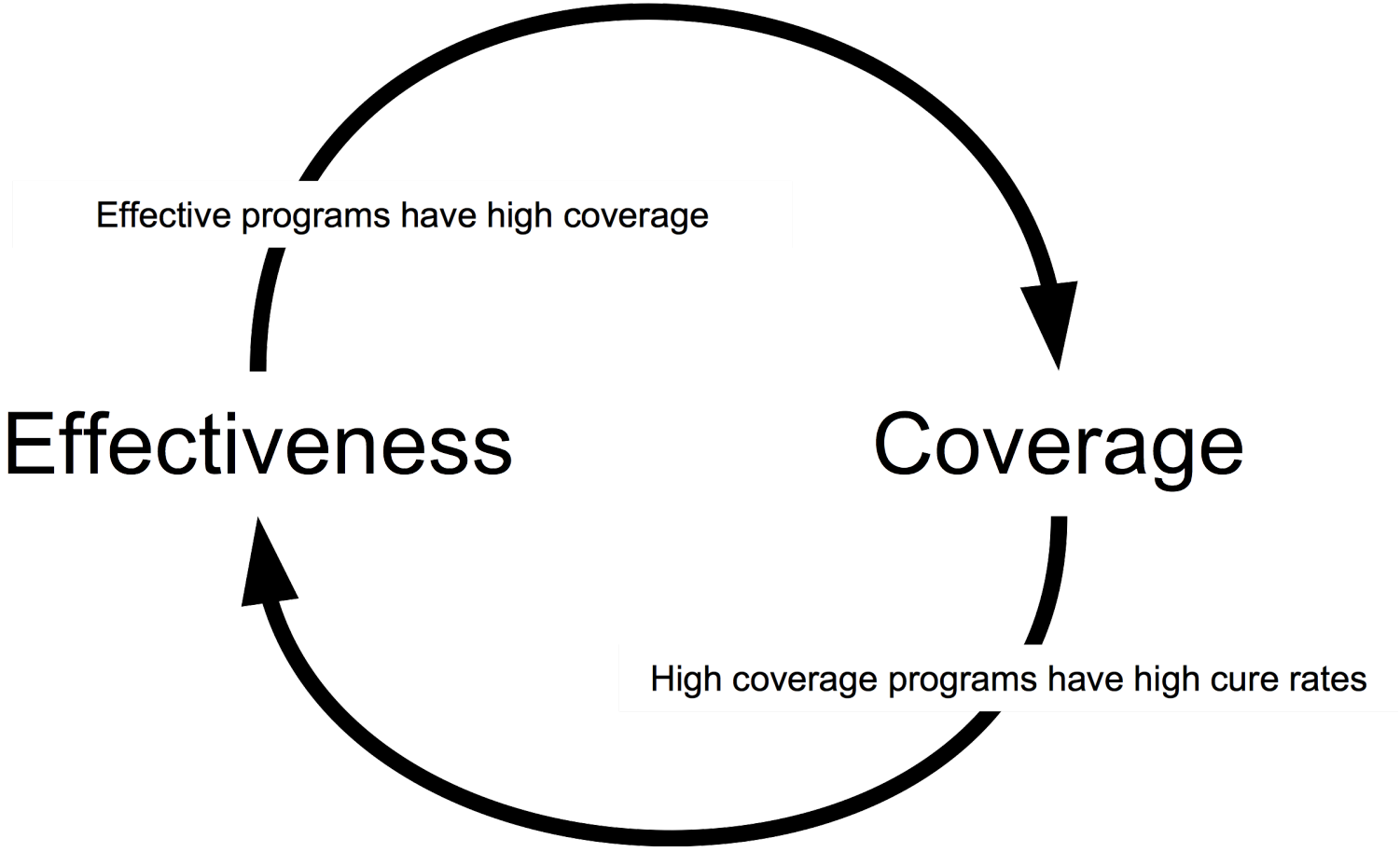
Effective CMAM meets needs

- **Efficacy** of CMAM - cure rate in ideal and controlled settings - is near 100%
- **Effectiveness** of CMAM - cure rate in programme conditions - still room for improvement
- Effectiveness depends on:

    1. Thorough case-finding and early treatment-seeking;
    2. High-level of compliance; and,
    3. Good retention from admission to cure.

High coverage CMAM meets needs

- **Coverage** of CMAM – the proportion of all children eligible to receive CMAM who actually receive it – contributes to effectiveness as well
- Coverage directly depends on:
    1. Thorough case-finding and early treatment-seeking; and,
    2. Good retention from admission to cure.
- It also indirectly depends on **compliance**.

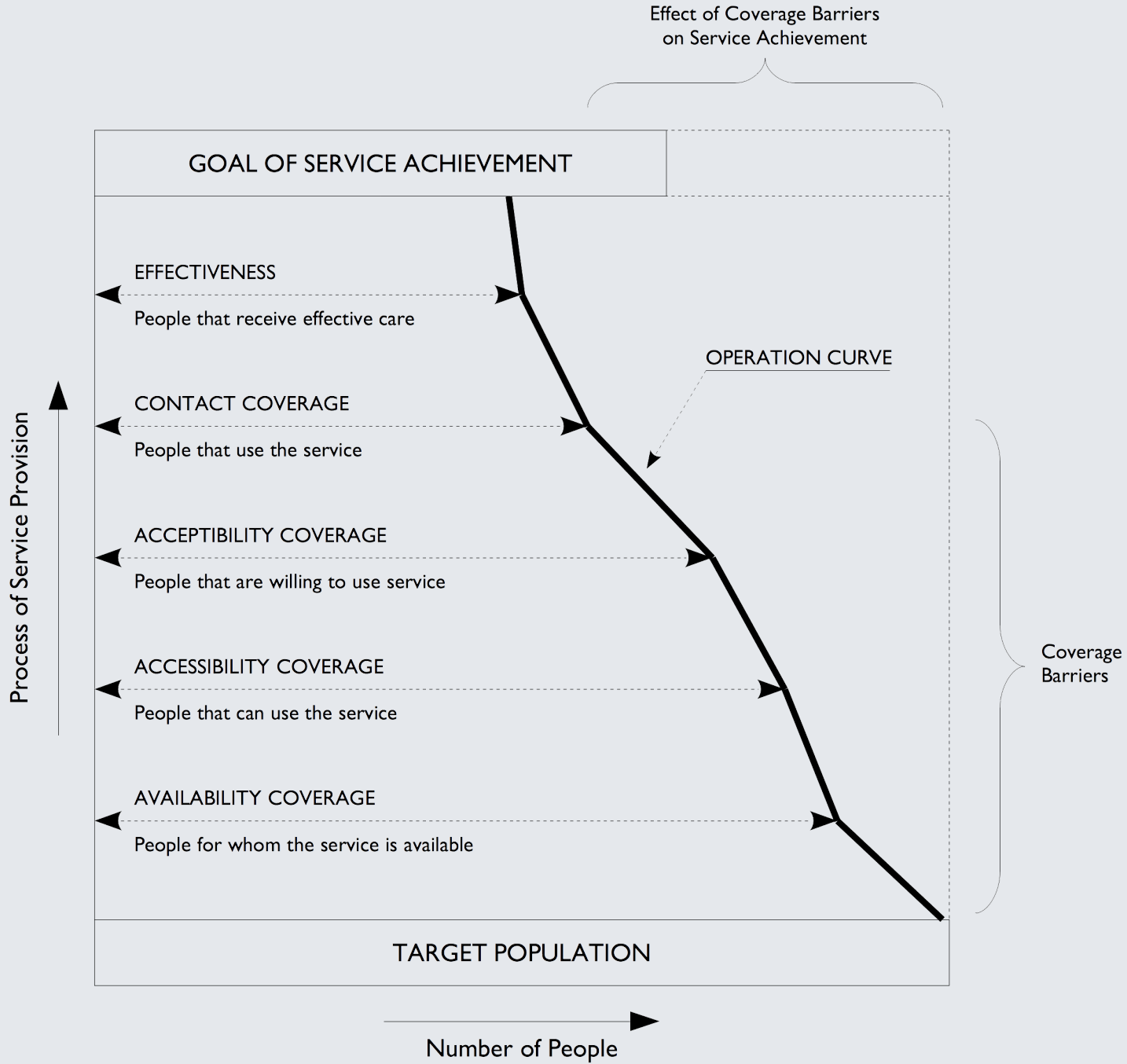


Meeting needs require both high effectiveness and high coverage

- Good coverage supports good effectiveness
- Good effectiveness supports good coverage
- Maximising coverage maximises effectiveness and met need

$$\text{Met need} = \text{effectiveness} \times \text{coverage}$$


High-Coverage Program
Need
100
80% Coverage
Recruited
80
90% Cured
Met Need
72
Low-Coverage Program
Need
100
Coverage Bottleneck
30% Coverage
Recruited
30
75% Cured
Met Need
23


Effect of Coverage Barriers
on Service Achievement
GOAL OF SERVICE ACHIEVEMENT
EFFECTIVENESS
People that receive effective care
OPERATION CURVE
CONTACT COVERAGE
People that use the service
ACCEPTIBILITY COVERAGE
People that are willing to use service
ACCESSIBILITY COVERAGE
People that can use the service
AVAILABILITY COVERAGE
People for whom the service is available
Process of Service Provision
Coverage
Barriers
TARGET POPULATION
Number of People

How to measure coverage?

Indirect estimation of coverage

$$\text{coverage} = \frac{\text{Total cases admitted in programme}}{\text{Estimated number of cases}}$$

- **Numerator** is based on programme data
- **Denominator** is a caseload estimation based on total population in programme area and known prevalence estimate and known incidence
- Issues mainly stem from estimation of denominator

Direct estimation of coverage

- Coverage estimation through a survey.
- Old approach: include coverage indicator in nutrition surveys that assess prevalence of undernutrition (SMART surveys)
- Issues with old approach: sample size
- Current approaches: surveys specifically assessing coverage

History of methods development

- Coverage and its assessment was an integral component of the development process of CMAM (then called CTC)
- **Centric Systematic Area Sampling (CSAS)** was the first coverage assessment method developed
- However, **CSAS** was not as commonly used as it was deemed too costly and hard to implement

History of methods development

- **SQUEAC** and **SLEAC** were then developed as quick and easy (hence less costly) methods to assess coverage
- **SQUEAC** and to some extent **SLEAC** now widely used and considered the standard, off-the-shelf methods
- With CMAM programmes getting scaled up to national scope, a wide area/large scale method such as **S3M** has been recently developed

CSAS: Design

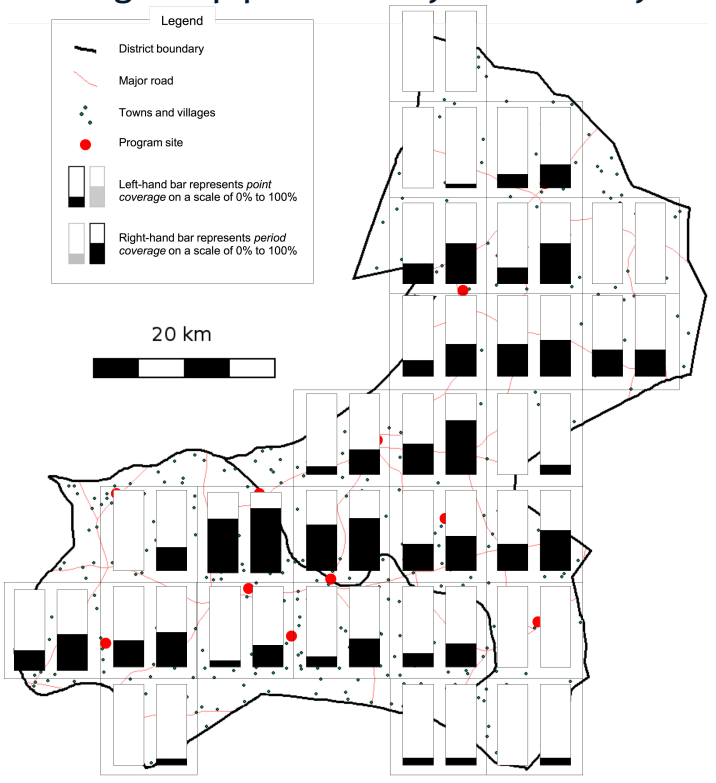
- **CSAS** uses a two-stage sampling design
- The first stage is a **systematic spatial sample** of the entire service area to select the communities to survey.
- The second stage is an **active and adaptive case-finding method** that finds all or nearly all cases in the communities being surveyed.

CSAS: Results

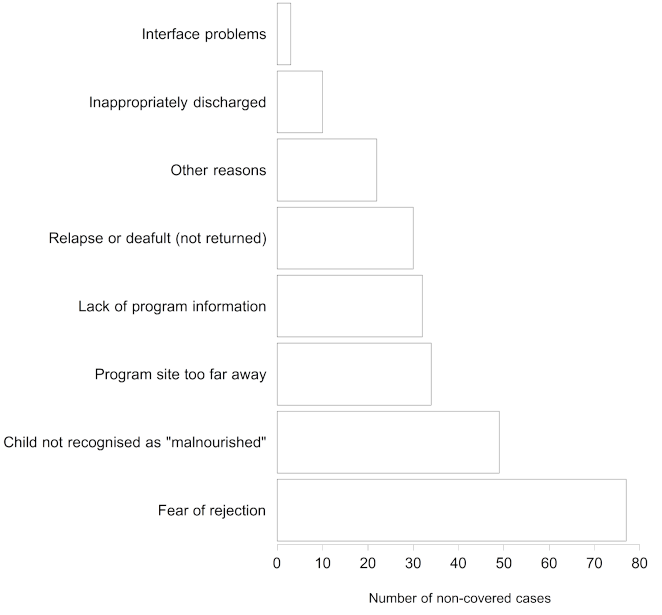
- Overall coverage estimate
- Local coverage estimates which can be represented as a coverage map
- Ranked list of barriers

CSAS: Results

Coverage map produced by CSAS surveys



Ranked list of barriers from a CSAS survey

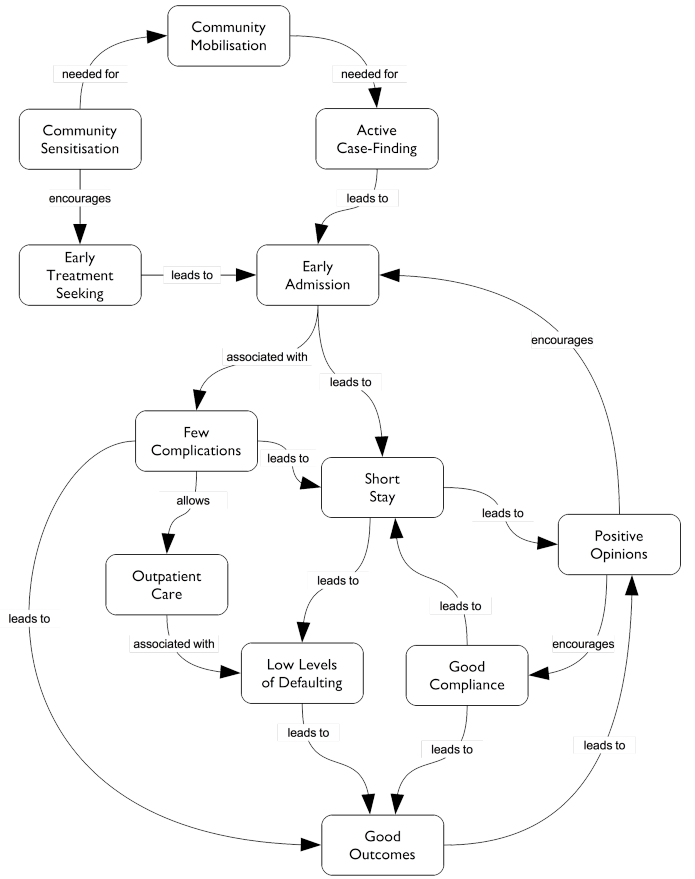


SQUEAC: Design

- **Semi-quantitative Evaluation of Access and Coverage** or **SQUEAC** is more an investigation than a survey
- **Stage 1:** Semi-quantitative investigation into factors affecting coverage using the **SQUEAC** toolkit, which is a set of simple and rapid tools and methods for collecting and analysing data related to coverage.
- **Stage 2:** Confirm areas of high and low coverage and other hypotheses relating to coverage identified in stage 1 through small studies, small surveys, and small-area surveys.
- **Stage 3:** Estimate overall coverage using Bayesian techniques. A likelihood survey is conducted as part of this stage. This two-stage sampling design is the same as with all other coverage survey methods.
    - This stage is optional. Should be done if the reporting of an overall coverage estimate is a key information requirement in addition to the rich information on barriers and boosters to coverage already gained from stages 1 and 2.

SQUEAC: Results

- Concept map of barriers and boosters to coverage
- Coverage map using small area surveys through a “risk mapping” approach
- Estimation of coverage proportion using Bayesian techniques



SLEAC

- **Simplified Lot Quality Assurance Evaluation of Access and Coverage (SLEAC)** is a rapid low-resource survey method that classifies coverage at the service delivery unit (SDU) level.
- Identifies the category of coverage (e.g. **"low"**, **"moderate"** or **"high"**) achieved by the service delivery unit being assessed.
- Relatively small sample sizes (e.g. $n \geq 40$) are required in order to make an accurate and reliable classification.
- Can also estimate coverage over several service delivery units and is suited to wide-area use.
- Coverage is still classified for the individual service delivery units, then, data from individual service delivery units are combined and overall coverage for the wide area is estimated.

SLEAC: Design

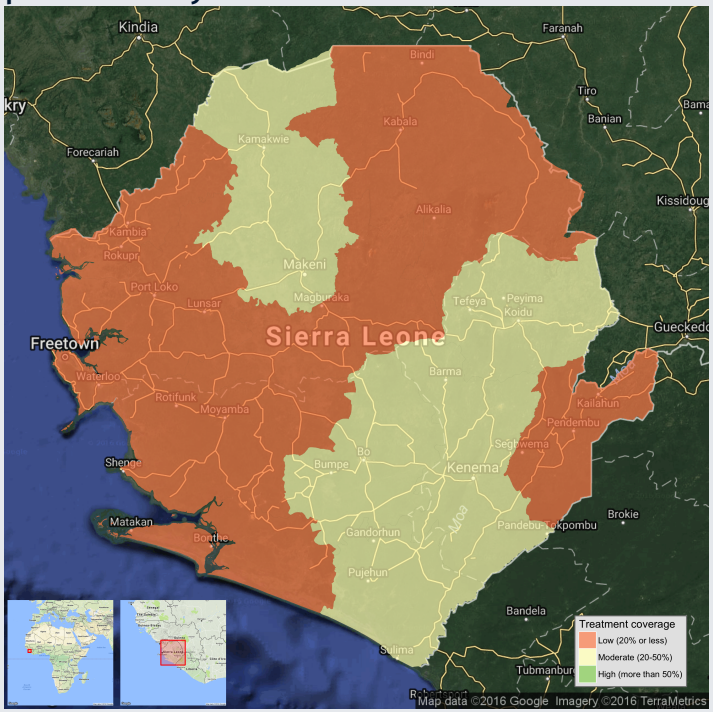
- First stage systematic spatial sample similar to that used in CSAS. Only small sample sizes ($n \geq 40$) are required for each service delivery unit in which coverage is being classified.
- Second stage sample is an active and adaptive case-finding method as with the other coverage survey methods.

SLEAC: Results

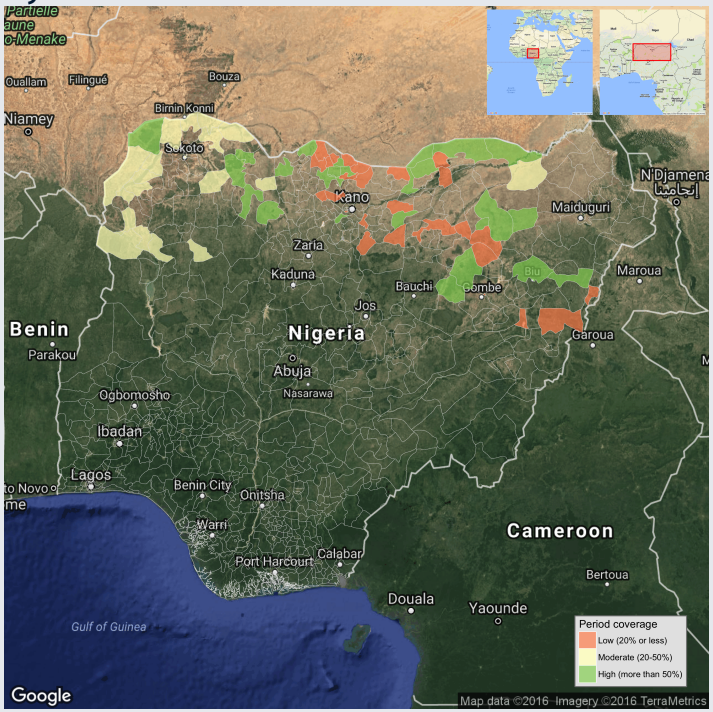
- Indicator classifications
- Can be used over wide areas to provide local indicators classifications with a map and a wide area estimate
- Ranked list of barriers

SLEAC: Results

Sierra Leone National Coverage Map produced by SLEAC



Northern Nigeria coverage map produced by SLEAC

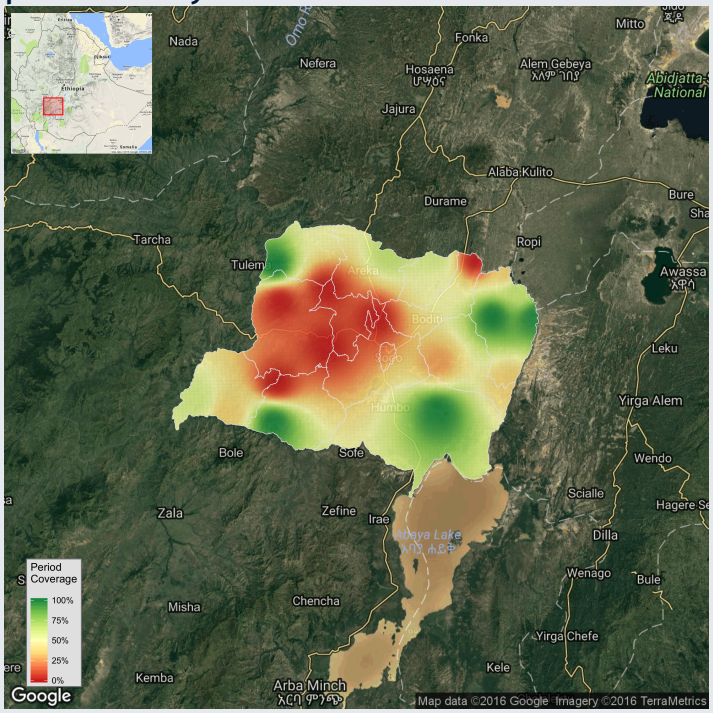


S3M

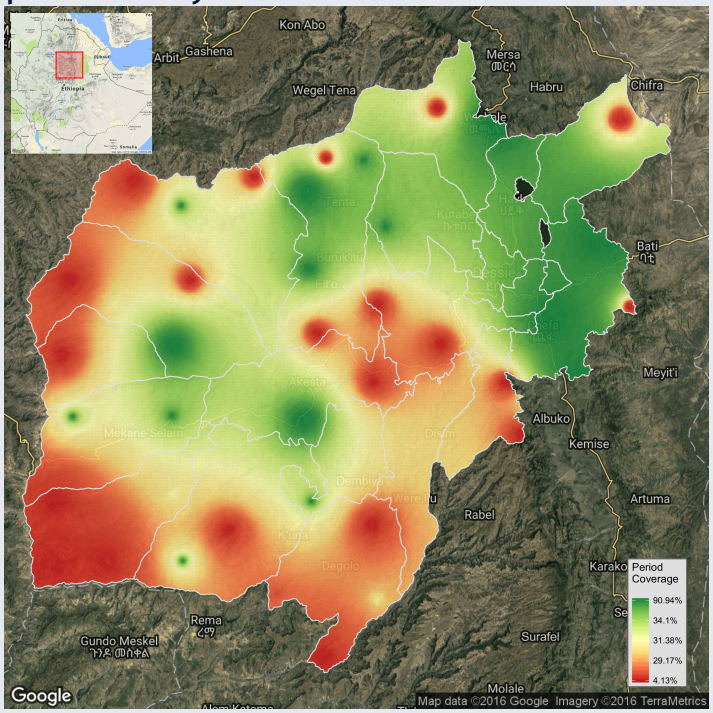
- **Simple spatial sampling method (S3M)** is a development of **CSAS** and uses a similar sampling design.
- The main difference is **S3M** uses a hexagonal grid (as compared to a square grid for **CSAS**).
- Hexagonal grids address the issue of unevenness of spatial sampling created by square grids particularly at scale

S3M: Results

Coverage map of Wolayita Zone, Ethiopia produced by S3M



Coverage map of Wollo Zone, Ethiopia produced by S3M



Coverage challenges

- Global CMAM coverage average is about 30%
- Coverage assessment fatigue (?)
    - Same barriers and boosters are being identified
    - Same low levels of coverage being achieved
    - Better to act on what the current coverage assessments are saying about coverage to try to improve things before more coverage assessments are done
- Which barriers to focus on? Is there a **"magic bullet"**?