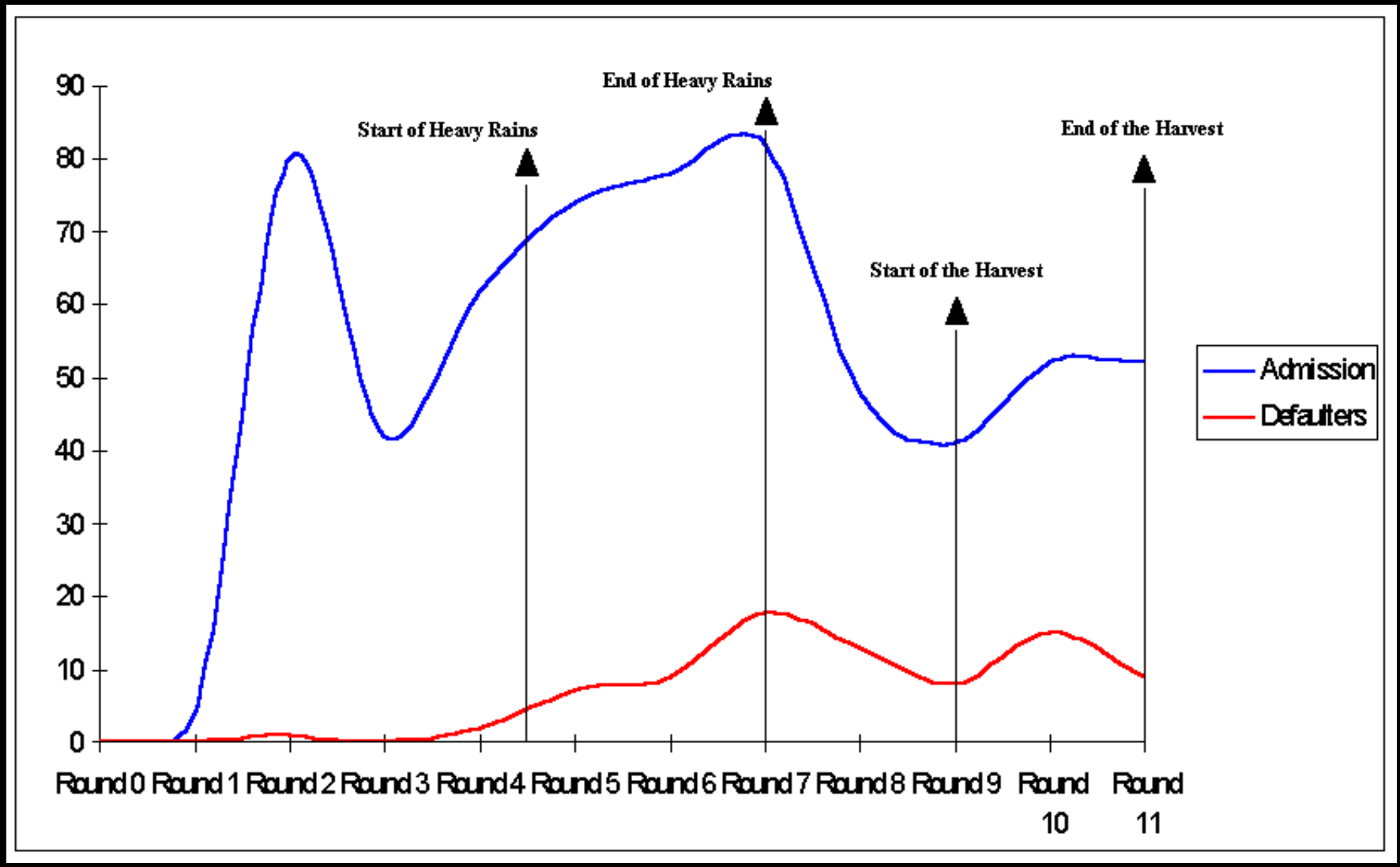
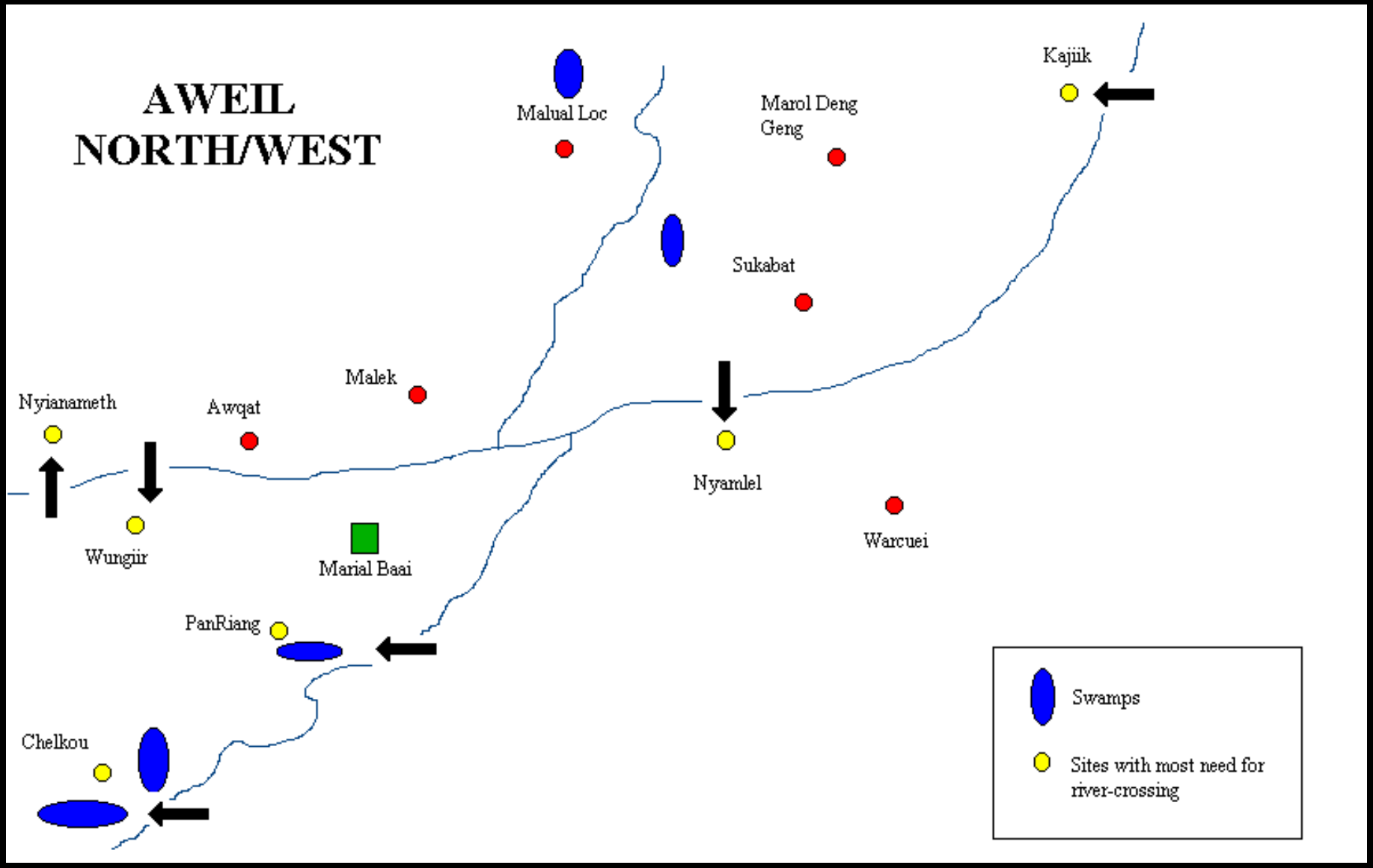
SQUEAC

Semi-Quantitative Evaluation of Access & Coverage

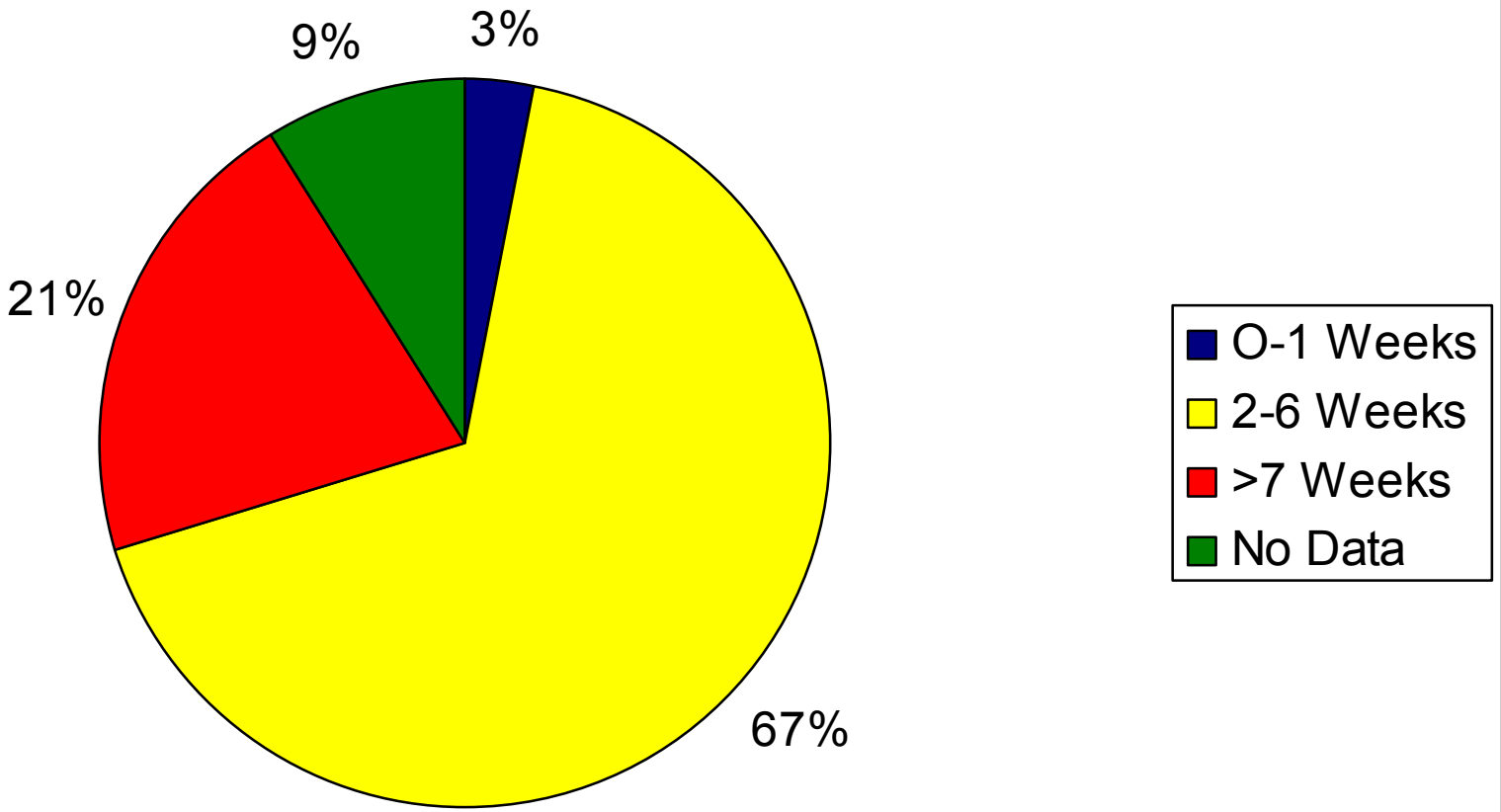
Figure 1. OTP Defaulters and Admissions (South Sudan 2003)



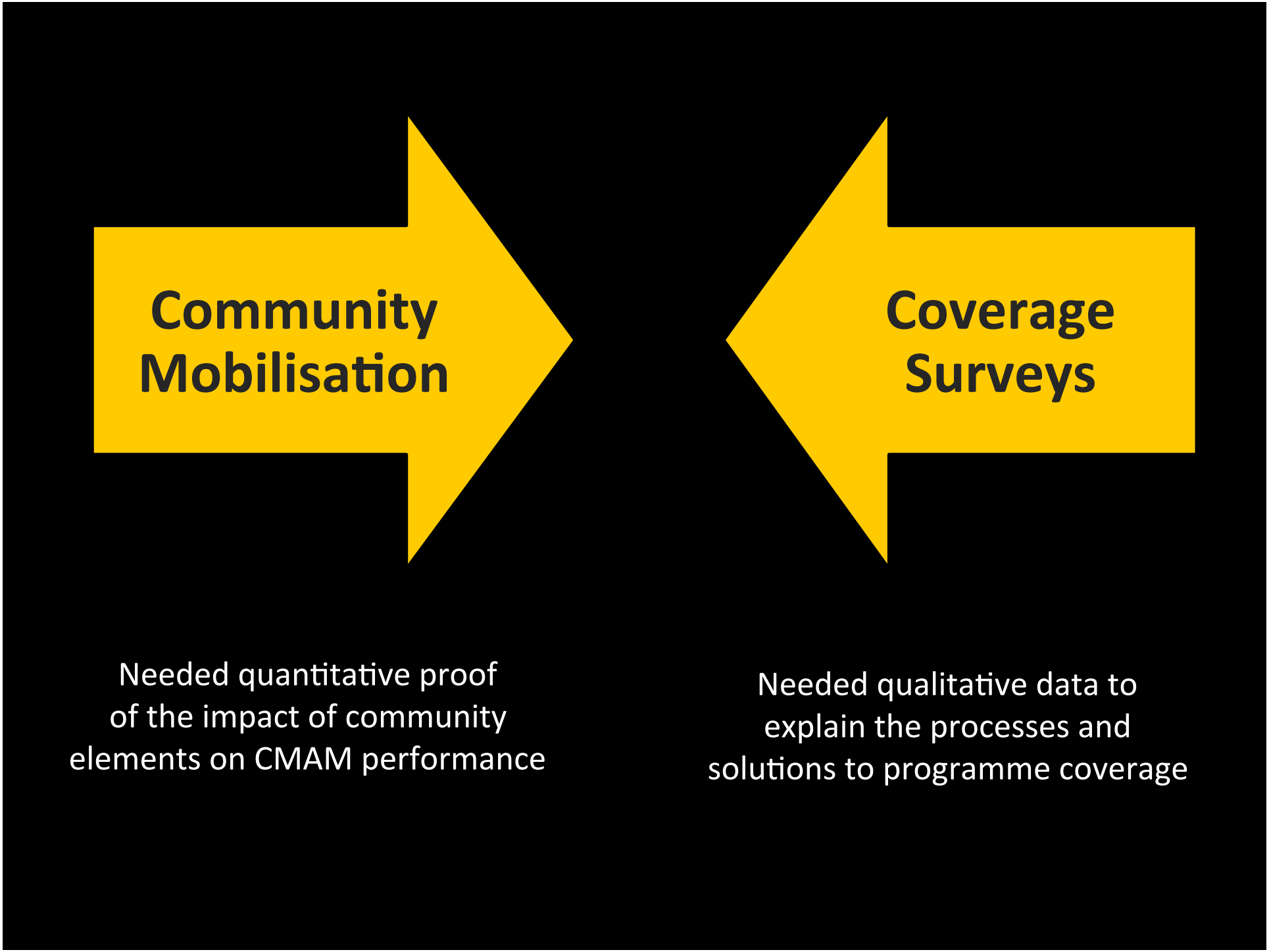
(South Sudan 2003)



OTP Defaulters by Length of Stay in the Programme (South Sudan 2003)



The process of developing SQUEAC came from two sides


Community Mobilisation
Coverage Surveys
Needed quantitative proof of the impact of community elements on CMAM performance
Needed qualitative data to explain the processes and solutions to programme coverage

Understanding this is essential to understanding the rationale, framework and potential of SQUEAC

SQUEAC is an investigation, not a survey methodology

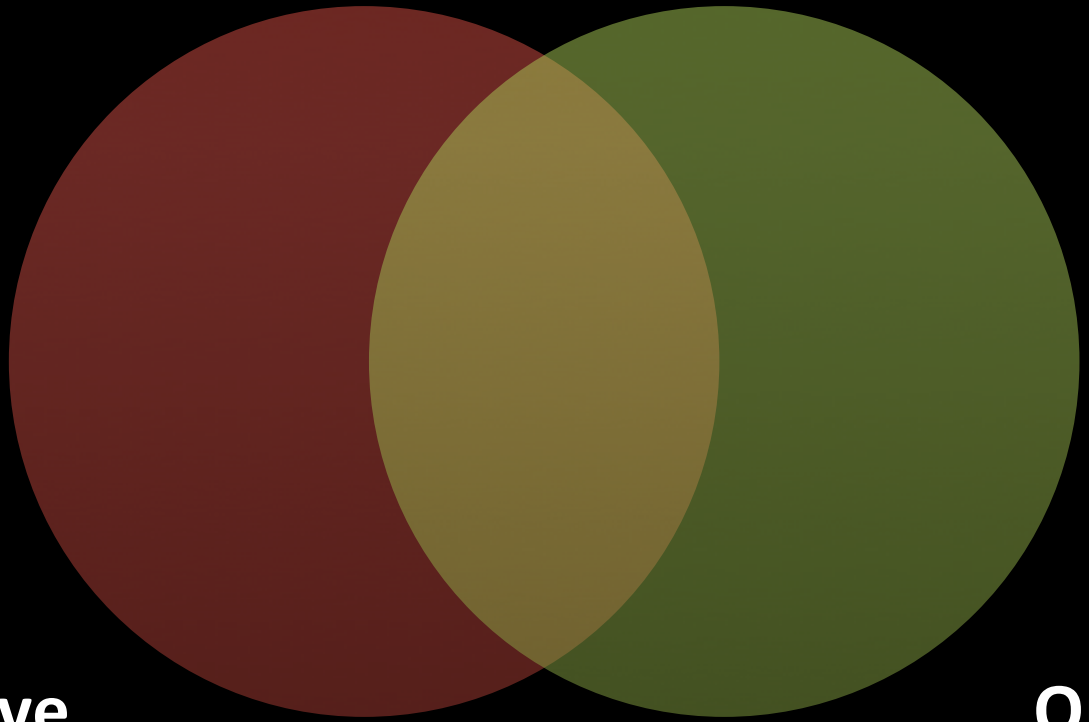
It contains survey elements, but its semi-quantitative precisely because it goes further and brings qualitative and quantitative evidence together to produce a comprehensive understanding of coverage and the dynamics associated with it.

The lack of a rigid method, however, does not mean that there is no specific process, it means that we cannot pre-empt all aspects of the process nor the result

All investigations must be adapted as new evidence comes to light

But equally, there are steps that all investigations take – mostly because we know that we are likely to identify valuable information in following these

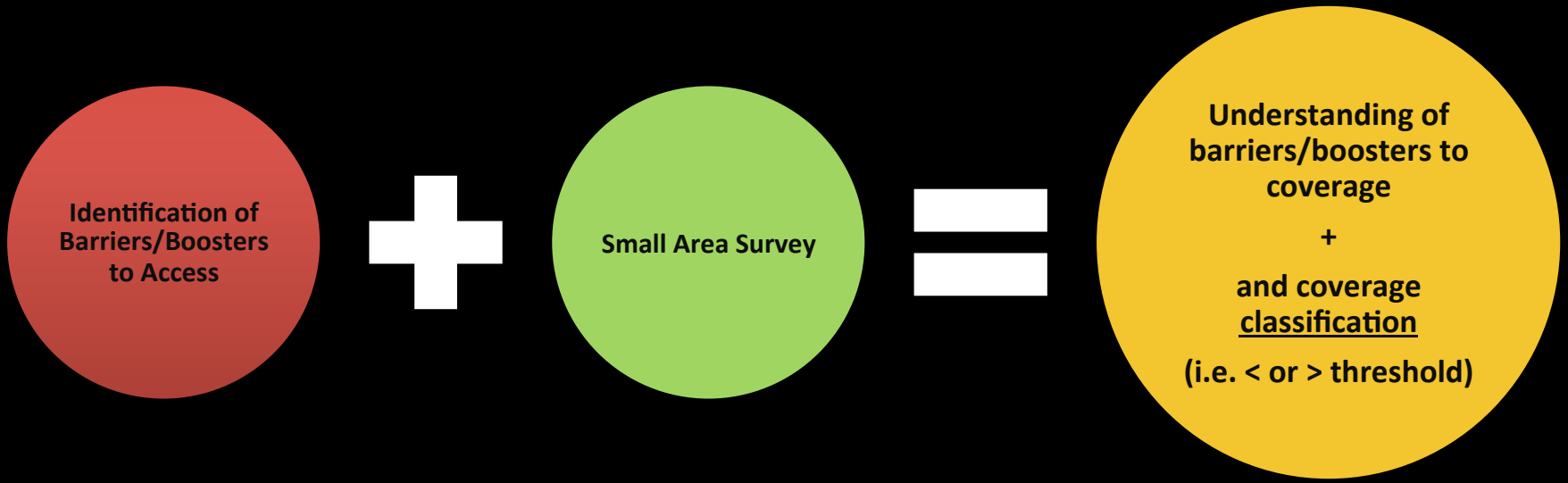
But how can we bring these two data-sets together?



Qualitative

Quantitative

Preliminary Version developed based on two stages



Pros

Fast tool highlighting barriers/boosters to access and some degree of understanding of coverage performance

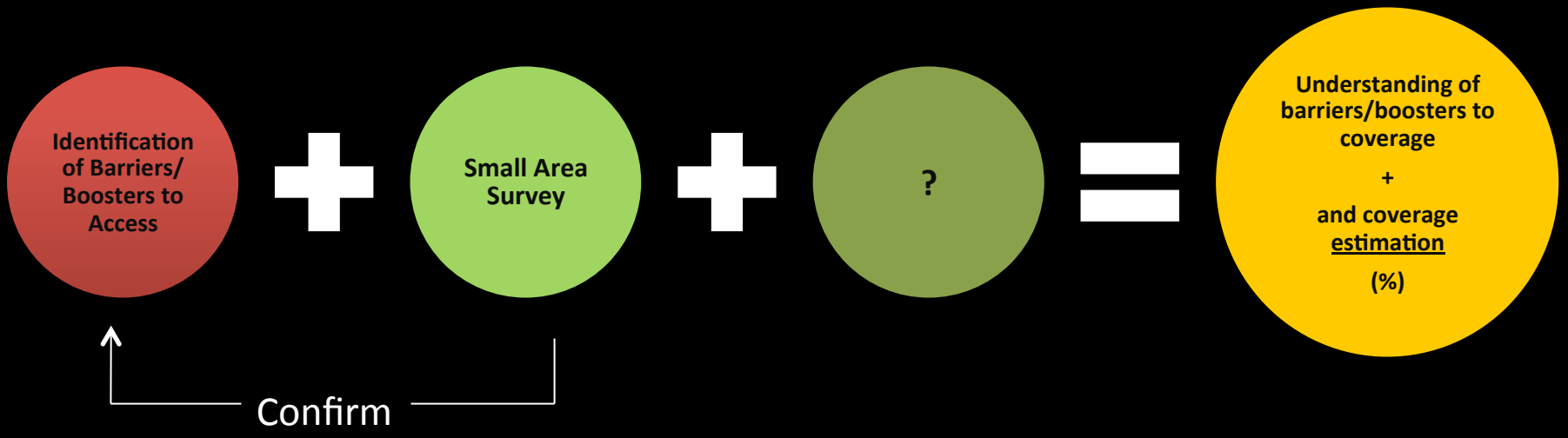
Cons

No coverage estimation

Getting the sample size necessary to produce a reliable estimation of coverage had traditionally required a large sample size

It was this need that had contributed to CSAS becoming resource-intensive

Ideally….


Identification of Barriers/ Boosters to Access
Small Area Survey
?
Understanding of barriers/boosters to coverage
+
and coverage estimation
(%)
Confirm

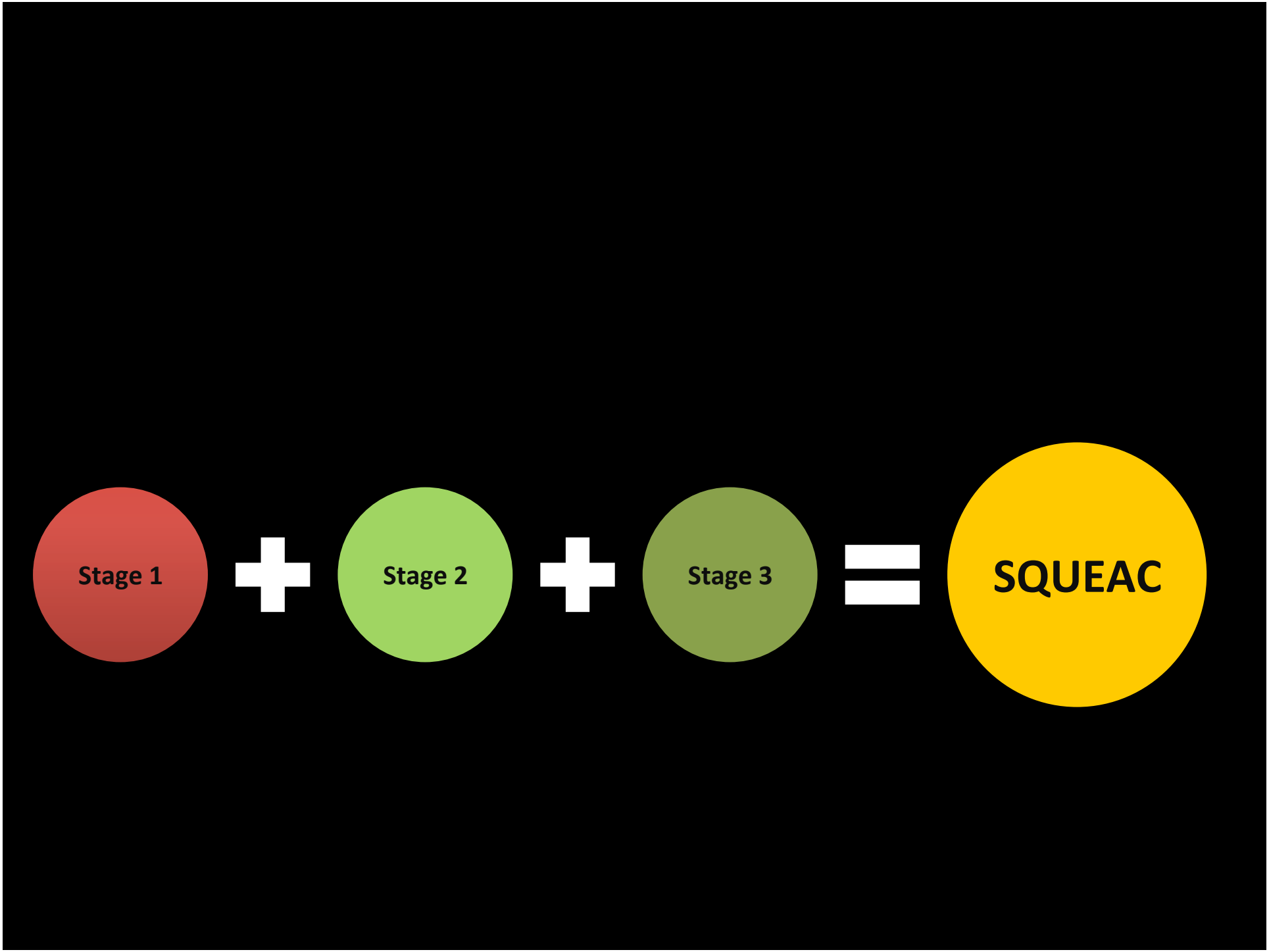
What could SQUEAC use to obtain a reliable coverage estimation without the need for a large sample size?

We turned to Bayesian statistics

We turned to Bayesian statistics

And this gave us the equivalent of a large sample size, in a much shorter timeframe

Together, these three element are now known as SQUEAC


Stage 1
Stage 2
Stage 3
SQUEAC

How can Bayesian statistics do this?

Thomas Bayes (c. 1701 – 7 April 1761)

To evaluate the probability of a hypothesis, the Bayesian probabilist specifies some prior probability, which is then updated in the light of new relevant data

We will deal with the practical implications of Bayesian probabilities later

The key is to understand that Bayesian probability allows us to do calculations when time is limited...

Proceedings of the 18th Conference on Behavior Representation in Modeling and Simulation, Sundance, UT, 31 March - 2 April 2009
[paper: 09-BRIMS-012, pp. 49-56]

A Bayesian approach to modeling lost person behaviors based on terrain features in Wilderness Search and Rescue

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ABSTRACT: *In Wilderness Search and Rescue (WiSAR), the incident commander (IC) creates a probability distribution map of the likely location of the missing person. This map is important because it guides the IC in allocating search resources and coordinating efforts, but it often depends almost exclusively on prior experience and subjective judgment. We propose a Bayesian model that utilizes publicly available terrain features data to help model lost person behaviors. This approach enables domain experts to encode uncertainty in their prior estimations and also make it possible to incorporate human behavior data collected in the form of posterior distributions, which are used to build a first-order Markov transition matrix for generating a temporal, posterior predictive probability distribution map. The map can work as a base to be augmented by search and rescue workers to incorporate additional information. Using a Bayes χ^2 test for goodness-of-fit, we show that the model fits a synthetic dataset well. This model also serves as a foundation of a larger framework that allows for easy expansion to incorporate additional factors such as season and weather conditions that affect the lost person's behaviors.*

1. Introduction

In the priority search phase of the Wilderness Search and Rescue (WiSAR), a probability distribution map for the likely place to find the missing person is created based upon terrain features, profile of the missing person, weather conditions and subjective judgment of expert searchers. The incident commander uses this map to allocate resources, to direct search, and to coordinate rescue workers. Areas with high probabilities are searched first in hope of finding the missing person quickly. Such a probability distribution map can also be used by manned or unmanned aerial vehicles for path planning purposes, thus facilitating effective aerial search.

In this paper, we propose a Bayesian approach in modeling lost person behaviors in order to generate such a probability distribution map automatically. The search and rescue workers can then augment this base map to incorporate their own beliefs to generate the final probability distribution map. We argue that using the Bayesian approach to automatically generate the map can be beneficial in the following ways:

1) The Bayesian approach allows the search and rescue workers to naturally incorporate their uncertainty by specifying a mean and a variance with a continuous Beta distribution.

2) This approach allows the incorporation of actual human behavior data collected in order to generate posterior beliefs.

3) The map generated using the Bayesian model means that the search and rescue workers do not have to build the probability distribution map from scratch and it reduces the chance that the search and rescue workers might overlook a certain area that should have been allocated higher probabilities.

4) As time progresses, the probability distribution map can be dynamically updated. Assuming a first-order Markov process, the Bayesian model can easily incorporate the time element into the equation and allow the search and rescue workers to observe how the proposed probability distribution map changes over time especially as information is collected. This can become very useful if the search and rescue operation takes an extended period of time.

Many factors affect how the probability distribution map might turn out. Examples include season of the year, the weather conditions, the profile of the missing person (age, gender, professions, intention, etc.), and the terrain features of the area. The Bayesian model proposed in this paper mainly focuses on the terrain features, specifically, the topology type, vegetation coverage, and elevation. However, the model is designed so that it can be easily extended to take other factors into consideration.

...and that Bayesian probability is founded on a very simple, and very intuitive concept

When we set out to find something, we already have a rough idea of where it is

In the case of programme coverage, we already have a sense of what coverage is likely to be and the reasons that will influence it

Practical Exercise

Identify the key elements determining programme coverage and rank them according to comparative impact

How do the results compare with available evidence on the subject?

doi:10.1111/j.0361-3666.2009.01144.x

Determinants of coverage in Community-based Therapeutic Care programmes: towards a joint quantitative and qualitative analysis

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One of the most important elements behind the success of Community-based Therapeutic Care (CTC) programmes for the treatment of severe acute malnutrition has been their ability to achieve high levels of coverage. In CTC, coverage is measured using the Centric System Area Sampling (CSAS) method, which provides accurate and reliable estimates of programme coverage as well as information on the primary reasons for non-attendance. Another important feature of CTC programmes is their use of socio-cultural assessments to determine potential barriers to access and to develop context-specific responses. By analysing data on non-attendance provided by CSAS surveys, in conjunction with data from socio-cultural assessments, it is possible to identify common factors responsible for failures in programme coverage. This paper focuses on an analysis of data from 12 CTC programmes across five African countries. It pinpoints three common factors (distance to sites, community awareness of the programme, and the way in which rejections are handled at the sites) that, together, account for approximately 75 per cent of non-attendance.

Keywords: barriers to access, Centric System Area Sampling, Community-based Therapeutic Care, coverage, socio-cultural assessments

Introduction

The Community-based Therapeutic Care (CTC) approach to the treatment of severe acute malnutrition (SAM) has been shown to be a high impact, cost-effective model of nutrition intervention (Tekeste, 2007; Collins et al., 2006a; Collins, 2007; ENN, 2003, 2005) and has been accepted as the basis of current United Nations (UN) recommendations for the management of SAM (United Nations, 2007). Important factors contributing to positive programme outcomes are the decentralisation of services, the use of simple protocols including Ready-to-Use Therapeutic Foods (RUTFs) (Briend et al., 1999; Briend, 1997; Henry et al., 2003; Ciliberto et al., 2005; Diop et al., 2003), working with mothers as primary caretakers of malnourished children, and the active participation of community figures (such as religious and socio-political leaders, community-based volunteers and civil society groups) to ensure early presentation of cases (Collins, 2007; ENN, 2005). These features

Published by Blackwell Publishing, 9600 Garsington Road, Oxford, OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA

Top 3 Reasons for Non-Attendance

1. Rejection
2. Lack of Awareness
3. Distance

SQUEAC in routine monitoring of CMAM programme coverage in Ethiopia

By Lily Schofield, Selome Gizaw Lalcha and Terefe Getachew

Lily Schofield has worked in many countries in Africa and Asia as a nutrition consultant. She has been involved in many coverage assessments of selective feeding programmes since 2007. She is currently working as the Evaluation and Research Support Advisor, Concern Worldwide Kenya.

Selome Gizaw Balcha has a BA in Sociology and Social Anthropology and works as a Senior Social Development Officer for the national CMAM programme, Concern Worldwide Ethiopia.

Terefe Getachew has an extensive background in community mobilization and has participated in multiple nutrition surveys and assessments. He is currently working as a Senior Social Development Officer for the national CMAM programme, Concern Worldwide Ethiopia.

The authors would like to thank the Woreda Health Offices and Health Centre Staff and all Health Extension Workers and Community Volunteers who took part in the survey, as well as the mothers and caregivers who participated as respondents.

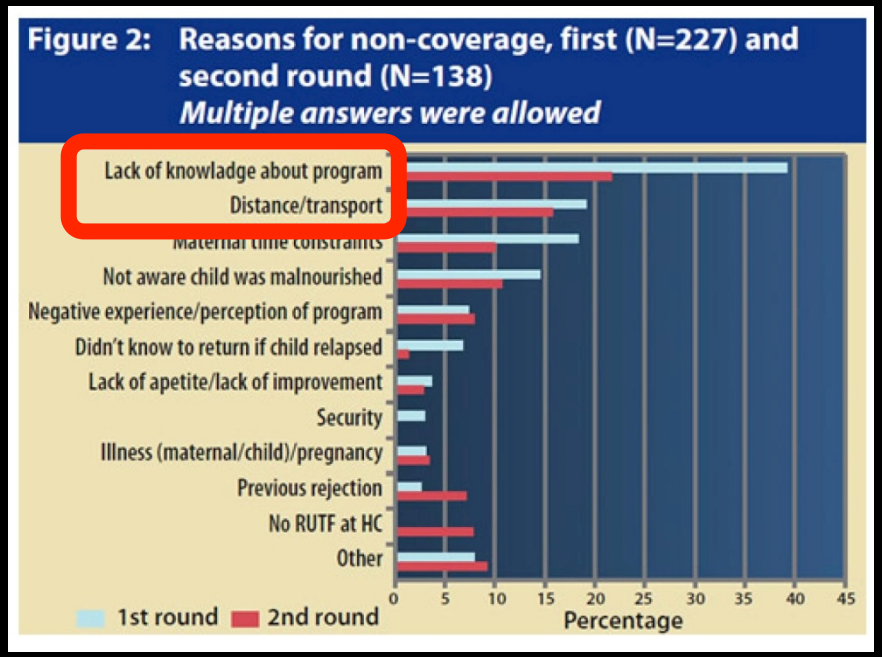
The development of community-based management of acute malnutrition (CMAM) was a significant advance in the treatment of severe acute malnutrition and associated child mortality. One of its primary innovations was the decentralization of services closer to beneficiary homes by treating children through out-patient therapeutic programmes (OTPs) rather than as inpatients. This translated into the potential for significantly higher coverage because travel time for beneficiaries was shortened and community mobilization improved[1]. However, in order to achieve this potential, regular monitoring of coverage levels and barriers to coverage are needed so that community outreach and mobilization strategies can be adapted accordingly.

The challenges of monitoring programme coverage

Measuring coverage of CMAM programmes presents special challenges when compared with other health services. Even during acute food emergencies, severe acute malnutrition (SAM) only afflicts a small percentage of the total under 5 population. Therefore, a random sample of all children under 5 is unlikely to include enough SAM children to estimate CMAM coverage with any precision. Secondly, traditional survey methods that rely on sampling proportional to population size may bias coverage estimates upwards, as areas of high population are more likely to be close to main roads and health centres (HCs)[2]. In response to these challenges, an alternative survey method based on area sampling was developed for assessment of CMAM coverage. This method, called Centric Systematic Area sampling (CSAS), overcomes the biases described above. However it remains a resource and time intensive methodology, typically requiring 12 to 18 enumerators for 7 to 10 days of data collection and significant logistical support. It is therefore a poor tool for routine monitoring of coverage, as only the most well resourced programmes can afford to conduct regular CSAS surveys.

The challenge of monitoring coverage becomes more acute when an integrated CMAM programme is considered. While many of the early CMAM programmes were implemented by non-governmental organisations (NGOs) in emergency settings, more and more countries are beginning to integrate the treatment of SAM into basic preventative and curative health services offered through Ministry of Health (MoH) facilities[3]. These programmes possess a high potential for sustainability, but are also resource constrained both in terms of staff and finances. The result is that in most integrated CMAM programmes, coverage is never assessed and so the proportion of SAM children being missed is never known. This also means the community mobilization cannot be evaluated and improved.

Valid International and partners recently developed a new methodology (SQUEAC) aimed at integrated CMAM programmes that is less resource intensive and requires only basic technical skills. This methodology is based



Using SLEAC as a wide-area survey method

By Ernest Guevarra, Saul Guerrero, and Mark Myatt

The authors would like to thank the Sierra Leone Ministry of Health and Sanitation for managing the survey and for allocating key ministry personnel to conduct the survey; Statistics Sierra Leone for providing relevant data and appropriate maps used during the survey; and UNICEF Sierra Leone for funding the survey. The authors' appreciation also goes to the people of Sierra Leone, without whose support and assistance this survey would not have been possible.

SLEAC stands for Simplified LQAS Evaluation of Access and Coverage. It is a quick and simple method for assessing coverage in a programme area such as a health district.

In 2010, UNICEF approached VALID International Ltd. to design and conduct a national coverage survey of the government-run community based management of acute malnutrition (CMAM) programme in Sierra Leone. Discussions with UNICEF and the Sierra Leone Ministry of Health indicated that a spatially exhaustive set of SLEAC surveys (i.e. a SLEAC survey performed in every health district) augmented by one or two targeted SQUEAC investigations would provide the information needed by both UNICEF and the Sierra Leone Ministry of Health. The idea of using the two methods together in this way is to use SLEAC to identify district programmes achieving low and high coverage and to use SQUEAC to investigate the reasons for the observed levels of coverage. Two variants of this model are outlined in Figure 1 and Figure 2.

This article describes how we used the SLEAC method to perform a wide-area coverage survey of the national CMAM programme in Sierra Leone. It also describes the SLEAC method in general terms.

The SLEAC method described: The simplified LQAS classifier

The SLEAC method classifies programme coverage for a service delivery unit such as a health district. A SLEAC survey does not provide an estimate of overall coverage with a confidence interval for a single service delivery unit. Instead, a SLEAC survey identifies the category of coverage (e.g. low, moderate, or high) that best describes the coverage of the service delivery unit being assessed. The advantage of this approach is that relatively small sample sizes (e.g. $n = 60$) are required in order to make accurate and reliable classifications.

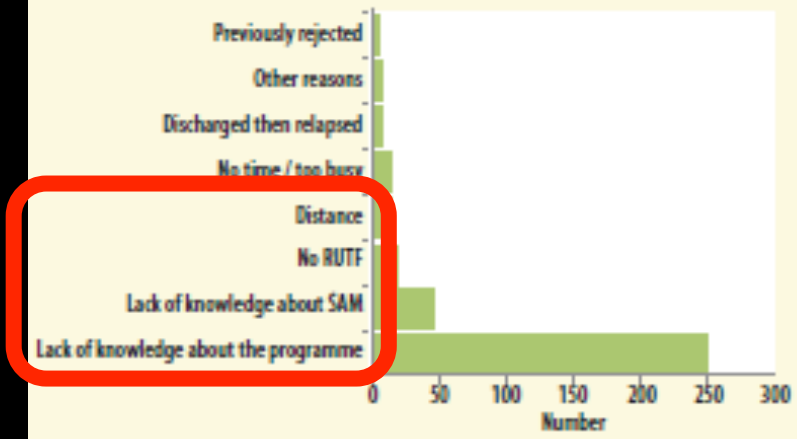
SLEAC uses the same simplified LQAS (Lot Quality Assurance Sampling) classification technique that is used in SQUEAC small-area surveys. The differences between how the simplified LQAS classification technique is used in SQUEAC and SLEAC are:

- The SLEAC survey sample is designed to represent an entire district rather than a small area.
- SLEAC surveys have no prior hypothesis regarding coverage. This means that SLEAC surveys require larger sample sizes than SQUEAC small-area surveys.
- A target sample size for SLEAC surveys is decided in advance of data-collection. This is usually about $n = 60$ severe acute malnutrition (SAM) cases.
- SLEAC surveys may classify coverage into three (or more) classes.

Analysis of data using the simplified LQAS classification technique involves examining the number of cases found in the survey sample (X) and the number of covered cases found:

- If the number of covered cases found exceeds a threshold value (d) then coverage is classified as being satisfactory.
- If the number of covered cases found does not exceed this threshold value (d) then coverage is classified as being unsatisfactory.

Figure 12B: Barriers to service uptake and access (national tallies from all SLEAC surveys)



Abstract

Session VIII: Promotion of Health in the Community

Title: Use of Semi-Quantitative Evaluation of Access and Coverage (SQUEAC) in Routine Monitoring of the CMAM Program Coverage in Kirehe and Ngoma District, Eastern Province, Rwanda

Authors: Dr Saleh Niyonzima[1], Pascal Nkuru and Eliane Ndererimana[2]

Institutions:
1. Rwanda MoH
2. Expanded Impact Child Survival Programme (EIP).

Background: EIP, in collaboration with the MoH, has been integrating the Community Based Management of Acute Malnutrition (CMAM) into the primary health care services in Kirehe and Ngoma district since January 2009. Severe acute malnutrition (SAM) is treated at hospital and health centres while Community Kitchens are used to manage moderate acute malnutrition at community. Community health workers, local authorities and model parents are trained to raise awareness on the danger signs of malnutrition, screen children and refer malnourished children for appropriate care.

A coverage survey was conducted in six health centres in the two districts to estimate the coverage of the CMAM program and identify barriers to accessing care using SQUEAC methodology.

Methods: The SQUEAC assessment was based on a two stage sampling method. First, routine programme data (admissions, recovery rates, defaults) were used to identify villages in each of the HC catchment areas that were likely to have low coverage. Reasons for low coverage were generated and qualitative information from key informants on perceptions of the program, causes of malnutrition and reasons for nonattendance were collected. Secondly, from both districts, 30 randomly selected villages were surveyed through active case finding.

Results: 16 out of 94 children screened were identified. Five were found to be in the programme at the time of the survey. The coverage was estimated at 44.5%, which is below the 50% minimum SPHERE Standards for rural areas. Major barriers identified were distances of travel to health centres, seasonal food availability, childhood diseases, Influence of traditional health practitioners and attitudes/ practices of some HC staff.

Conclusions: The sur
performance, althou
Further investigatio
recommended.

yed through active case finding.

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bility, childhood diseases, Influence of traditional health practitioners and attitudes/ practices
staff.

Country	Date	Awareness about the programme	Awareness about malnutrition	Distance	SFP-OTP Interface	Rejection	Carer Busy	Waiting Times at OTP	RUTF Stock-Outs	Husband's Refusal
Burkina Faso	Feb 2010	•			•	•				
Chad	De 2010	•	•	•						
Burkina Faso	Mar - Apr 2011	•	•		•					
Mauritania	Mar - Apr 2011		•							
Liberia	Feb - Apr 2011	•	•				•			
Mali	Jul 2011	•	•						•	
Nigeria	Aug 2011	•		•		•				
Chad	Sep 2011	•		•				•		
Chad	Oct 2011	•	•	•						
South Sudan	Oct 2011	•	•			•				
South Sudan	Nov 2011	•		•		•				
South Sudan	Dec 2011	•	•	•						
Myanmar	Nov - Dec 2011			•		•				•
Haiti	Jan 2012	•	•	•						

If there are issues that consistently define programme coverage, why do we need to carry out investigations?

The answer is that we need to understand how these issues manifest locally (concept map), and their relative impact on the programmes evaluated

This is essential if programme implementers are to utilise the findings of coverage assessments to improve performance

Some Examples…

Awareness about Malnutrition

Recognising Cause & Effect

SAM cases seen as "sick" or suffering from the effects of malaria/diarrhea/ARIs

↓

Do sensitisation strategies acknowledge and reflect local understandings in a way that facilitate linkages between cases and programmes?

Awareness about Malnutrition

Links with Behaviour

Kwashiorkor in northern Mozambique is known as the "child who was jumped over"

↓

Do sensitisation strategies alienate potential beneficiaries?

Awareness about the Programme

Communication in urban environments

Information flows differently in urban environments, saturated with information, and with limited inter-household communication

↓

Are sensitisation strategies based on the opportunities and challenges posed by each context?

Awareness about the Programme

No Information vs. Misinformation

In many contexts, including Darfur and DRC, CMAM programmes are seen as catering for specific religious or ethnic groups

↓

Are programmes conscious about community perceptions and actively addressing misconceptions?

Distance

How far is too far?

Perceptions of distance vary significantly from one context to another. In Banda Aceh (Indonesia) an hour walk is seen as far, whilst in Ethiopia is common to see mothers travel for up to 9 hours to reach programmes

↓

Are programmes designed with local perceptions of acceptable distance (time to travel) in mind, or on absolute values of permissible distance?

Distance

How much does 1km cost?

In many contexts, distances are measured not in terms of kms, but of price of local transport.

Are programmes aware of how people access services and the costs involved? Are programmes proactively seeking ways of reducing these costs?

Programme – Beneficiary Interface

RUTF Stock-Outs

Nothing changes beneficiaries trust in a programme more (or more often) than RUTF stock-outs.

How often are stockouts occurring? Are programmes taking active measures to avoid this? Do they affect all sites equally?

Programme – Beneficiary Interface

Rejection

Using a common criteria for referral and admission (e.g. MUAC) is essential to minimise rejection

↓

Are programmes using a common referral and admission criteria – in theory (e.g. protocols) and in practice (e.g. at facility level)?

Programme – Beneficiary Interface

Waiting Times

The amount of time that caretakers are expected to spend waiting at health facilities can make or break a programme. This is particularly problematic in high prevalence areas.

Are programmes monitoring and addressing issues relating to waiting times? Do they have strategies in place to maintain waiting times low in the face of high admissions?

Question & Answers

(10 minutes)