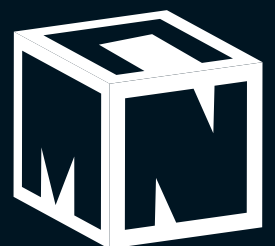

ACCESS FOR ALL

VOLUME 1:

Is community-based treatment of severe acute malnutrition (SAM) at scale capable of meeting global needs?

SAUL GUERRERO & ELLIE ROGERS



COVERAGE MONITORING NETWORK

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In little over four decades, SAM treatment has gone from a small-scale clinical endeavour to a global public health service reaching over two million cases a year. Much of this scale-up has occurred in the last decade following the introduction of community-based SAM treatment approaches. Since the rapid-scale up of such community-based approaches, however, there have been few overarching reviews of their performance over time.

This report, the first in a three part series, offers a comparative assessment of the performance and effectiveness of the model during two distinct periods of its development: from 2001-2006 when the majority of community-based treatment projects were implemented by NGOs; and from 2007-2013 when many community-based treatment programmes were integrated by ministries of health into regular health services. For each period, three components of the community-based treatment model are assessed: the capacity of treatment services to successfully cure SAM cases, their capacity to reach the highest proportion of the affected population (coverage) and their cost-effectiveness.

THE REPORT HAS THREE MAIN CONCLUSIONS:

1 *Community-based treatment models deliver exceptional clinical outcomes. The median cure rates of community-based models in the 2001-2006 and 2007-2013 periods were 80% and 84% respectively. **SAM cases admitted into treatment services today are as likely to be successfully cured today as they were a decade ago.***

2 *In areas where SAM services are available, only a third of affected cases actually access treatment. The analysis shows that whilst high coverage can be achieved by community-based SAM treatment, the conditions necessary to do so are seldom met. **The capacity of treatment services to meet global SAM needs depends on coverage being significantly and consistently improved.***

3 *Community-based models are more cost-effective than in-patient models. Cost-effectiveness analyses show that some community-based models were two times more cost-effective than in-patient models. **In spite of their dependency on context-specific operational factors, recent evidence suggests that MoH delivered community-based SAM treatment services continue to be cost-effective interventions.***

VOLUME TWO of this three-part series will look more closely at the issues affecting the coverage of community-based SAM treatment services and will ask, what prevents SAM cases from reaching treatment services? **VOLUME THREE** will explore possible programmatic and policy changes to make SAM treatment more accessible and will ask, what can we learn from other public health interventions about overcoming these barriers?

The CMN project is an inter-agency initiative to improve nutrition programmes through the promotion of quality coverage assessment tools, capacity building and information sharing



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Today, a child suffering from severe acute malnutrition (SAM) is more likely to receive lifesaving treatment than at any previous point in history. Advances in the clinical understanding of SAM and the transition from inpatient to community-based care have been pivotal in making this possible. These advances have also facilitated the incorporation of SAM treatment into health systems in over 60 countries, turning what was once conceived as a humanitarian intervention into a feature of national health services worldwide. However, since the rapid scale-up of community-based SAM treatment, there have been few overarching reviews offering a comparative assessment of the performance and effectiveness of the community-based treatment model.

The first volume of this three-part series aims to provide this review.¹ It focuses on three key components of the model; 1) The capacity of treatment services to successfully cure SAM cases; 2) The capacity to reach the highest proportion of the affected population (coverage) and; 3) Its cost-effectiveness. It reviews performance during two distinct phases: the period of NGO-implemented programmes (2001-2006) and the period of integrated, Ministry of Health (MoH) -implemented services (2007-2013). This classification is not without its problems; many

programmes implemented between 2001 and 2006 had strong MoH involvement, whilst some programmes implemented after 2007 have had varying levels of NGO support. What is certain is that the implementation of community-based SAM treatment has gone from geographically-smaller, resource-heavy programmes to its delivery as part of broader national health services with decreasing levels of support and supervision. The essence of the model (e.g. promoting early identification and the treatment of most SAM cases on an outpatient basis) has remained the same, but the changes provide valuable evidence about the effectiveness of the model at scale.

The need to understand the opportunities and challenges of delivering SAM treatment at scale is rapidly growing. The recently published Lancet series on Maternal and Child Nutrition has made the scale up of SAM treatment services (at 90% coverage) a key feature of the proposed child survival framework. (1) UNICEF's most recent estimates, however, suggest that less than 15% of the current SAM caseload around the world is accessing treatment. (2) Increasing the proportion of SAM cases that access treatment is essential, and this publication aims to contribute to the evidence-based analysis and action necessary to bring this about.



¹ The authors recognise that the CTC/CMAM model was designed to provide treatment for both severe and moderate acute malnutrition and an analysis of its performance requires a review of both treatment components. This review focuses exclusively on SAM treatment, so whenever possible, the terms Community-based Therapeutic Care (CTC) and/or Community-based Management of Acute Malnutrition (CMAM) have been avoided.

The identification of the current treatment protocol for SAM began with the work of JC Waterlow in the Tropical Metabolism Research Unit in Jamaica in the 1960s. (3) Their extensive research on kwashiorkor and marasmus in hospitalised children enabled the creation of more appropriate diets for nutritional rehabilitation which are the basis of treatment used today. (3-7)

As the number of humanitarian emergencies increased in the last decades of the 20th century, (8) the operationalisation of SAM treatment became increasingly important. The first service delivery model, introduced in the mid-1970s, (9) was the Therapeutic Feeding Centre (TFCs). This model replicated in the field the type of clinical care previously delivered in hospitals, providing inpatient care with medical equipment and trained medical staff. (10) These temporary structures were often set up, funded and run by international non-governmental organisations (INGOs) in parallel to the local health system.

By 1993 a specific diet to treat SAM in TFCs had been formalised. (11) The formula was primarily based on M Golden's work and led to the commercial production of therapeutic milks F75® and F100® by Nutriset. (12,13) These milk-formulas, combined with the routine use of antibiotics, treatment for dehydration and the routine provision of measles vaccines and vitamin A, provided the first treatment protocol (11) and resulted in the first detailed manual to successfully rehabilitate SAM children. (14)

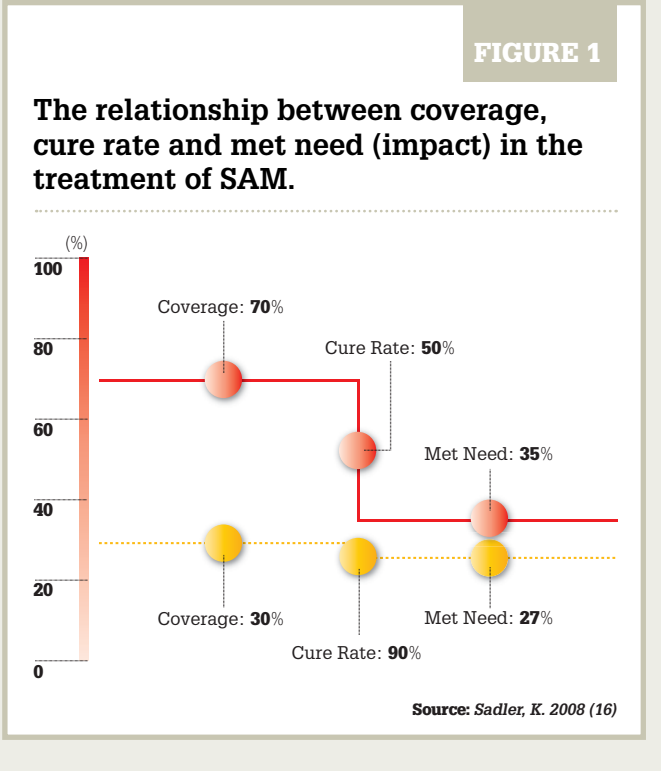
In spite of these significant clinical advances, major limitations affected the service delivery model. TFCs were considered efficacious, as the model could deliver acceptable results under ideal conditions, but in practice, they proved ineffective because these results were rarely achieved at scale. (15) Limited access to treatment, resulting in low coverage was the single biggest limitation of the TFC model (see box 1). Reliable and comparable data on TFC coverage is largely unavailable, but they are estimated to have reached between 4% (16) and 10% (17) of the affected population in their programme areas. TFCs could cure most of the SAM cases it admitted, but the majority of SAM cases could not access TFCs.

There were six key factors limiting access to TFCs and keeping coverage low: limited case finding, distance to services, (18) high opportunity costs for carers, (20,21) increased risk of cross-infection, (22) fixed capacity of TFCs and increased security risks attached to seeking care. (23) Many of the limitations were linked to intrinsic features of the treatment protocol;

SAM rehabilitation required trained medical personnel, and the use of F75® and F100® milk which in turn required clean, safe water for its preparation. But whatever the cause, the effects were clear; by ignoring the 'economic, psychological and social elements' of SAM, (10) treatment services were inaccessible to many, resulting in late presentation and low coverage. To break away from this, a definitive move from the dependency on

BOX 1 » What is Coverage

Coverage is commonly defined as the proportion of all people needing or eligible to receive a service who actually receive that service. It is considered a vital indicator of programme success and impact. (16) Together with programme efficacy, coverage determines the proportion of needs met by an intervention. (18) Lower cure rates and high coverage can actually lead to greater met needs than high cure rates and low coverage (see figure 1). Coverage is also used as a reliable proxy indicator of the level of accessibility of a given service. The lower the coverage, the less accessible a health programme



therapeutic milks was required as part of a model that would put access at its core.

S Collins was the first to publicly address these issues and to develop a viable, alternative service delivery model. To do this the first issue to tackle was the limitations of therapeutic milks themselves. Led by A Briend, in 1996 the first Ready-to-use Therapeutic Foods (RUTFs) to treat SAM were developed (19,24-27). RUTFs gave those working on an alternative delivery model a product that was fit-for-purpose. What was now needed was a quick and reliable method to identify SAM cases. By the early 2000s, sufficient evidence had been collected on the Mid-Upper Arm Circumference (MUAC) to demonstrate arm muscle mass alone as the most sensitive predictor of mortality at high specificity levels, and better than weight-for-height, weight-for-age and height-for-age. (28-30) MUAC measuring tapes were shown to be easy, simple and accurate enough to be used by non-medical volunteers. (30,31) If RUTF offered a way of successfully treating SAM at home, MUAC offered a simple and transparent way of identifying them in the communities.

Using these tools, a new community-based model was piloted (by S Collins, his team and partners) in Ethiopia and then Sudan, providing the basis of what would eventually become the Community Therapeutic Care (CTC) model. (32-33) CTC relied on the severity of malnutrition being classified in a way that was more appropriate (Annex 1). This public health model, based on the premise that the majority of cases could be treated as outpatients, involved a ‘fundamental reorientation of [the] way relief agencies view and respond to malnutrition during disaster.’ (34) The decentralised, outpatient model was designed to expand or retract to meet demand, it could operate in hard-to-reach areas and multiply its service delivery points to ensure homogenous geographical coverage (rather than simply favouring large population centres). (36) But perhaps the greatest change was for the caretakers of SAM children themselves, who went from passive observers to active participants in the rehabilitation of SAM children. (37) CTC made SAM treatment a public endeavour; communities took on the task of detecting cases and caretakers became the primary treatment providers. By shifting these responsibilities back to the community, CTC helped reshape the

BOX 2 » CTC Guiding Principles

‘[CTC] aims to provide rapid, effective, low cost assistance that is least disruptive to affected communities and builds a foundation to link relief and development interventions for long-term solutions to food insecurity and threats to public health’ (18).

- 1

MAXIMUM ACCESS AND COVERAGE
Decentralised centres and community participation allowed treatment to reach the highest proportion of the population in need. (35)
- 2

TIMELINESS
The limited resources needed for start-up allows it to be quick, thus meeting the need at the peak of the crisis.
- 3

SECTORAL INTEGRATION
The programme does not standalone but aims to work alongside health, food security and conflict resolution programs as well as provide nutrition and health education for carers. Another component is the local production of RUTF. Working with other sectors will help to increase the coverage and simultaneously strengthen all of the programmes involved. (35)
- 4

CAPACITY BUILDING
Where possible existing health system structures are used and developed instead of operating in parallel to the local health system.

way SAM treatment was understood not only by NGOs but also by national health authorities.

By 2007 it had become clear that the key questions about community-based SAM treatment were how to ensure greater involvement of national governments and the sustainability of treatment services. Official endorsement of the model would be key, and in 2007 the World Health Organisation (WHO), the World Food Programme (WFP), the UNSCN and UNICEF issued a joint statement supporting the implementation of (the newly labelled) Community-based Management of Acute Malnutrition (CMAM). (38) By the end of 2007, the number of countries

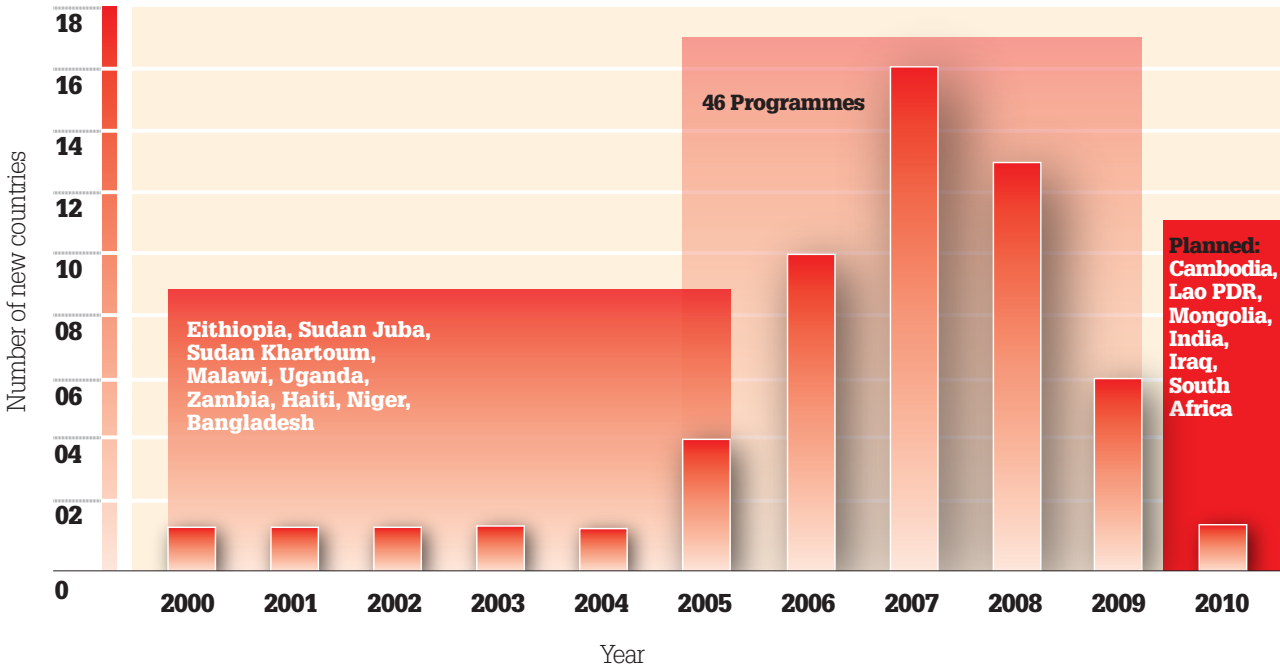
offering these services had quadrupled compared to just two years prior (see Figure 2). In 2008, the Lancet published the first of its Maternal and Child Nutrition series. The series focused global attention on SAM, by recognising it as a major public health issue responsible for a high proportion of child deaths. (39) It prompted the inclusion of SAM treatment in the package of interventions promoted by the SUN movement, (40) the

UN’s REACH initiative (41) and a World Bank analysis of the costs of scaling-up nutrition. (42)

In little over four decades, SAM treatment went from a small-scale clinical endeavour to a public health service reaching over two million cases a year around the world. The size and quantity of services available has grown exponentially throughout this period, but how has the quality of treatment changed or evolved?

FIGURE 2

Distribution of the number of new countries implementing CMAM programmes from 2000-2010.



Source: UNICEF/Valid International (2011), (52)

Community-based SAM treatment aims to deliver good clinical outcomes (high cure rates and low defaulter and death rates) for a higher proportion of the SAM affected population (high coverage). With over ten years of public data now available, did NGOs succeed in delivering this? To answer this question, three different types of evidence are considered; (a) clinical outcomes, (b) cost-effectiveness and (c) coverage.

Clinical Outcomes

An analysis of publicly available records² (n=64) of community-based SAM treatment programmes implemented between 2000 and 2006, suggests that they successfully delivered high quality treatment (see Figure 3)³.

CURE RATE <i>The median cure rate of SAM in programmes implemented between 2000 and 2006 is 80.0%. 68.8% of programmes achieved the SPHERE standard (>75%), whilst 31.3% of the sample failed to do so. The data range is 45% (50.0% to 95.0%) demonstrating that the model is capable of achieving high cure rates.⁴</i>	DEFAULTER RATE <i>The median defaulter rate is 8.0% for programmes implemented between 2000 and 2006 which is well below the SPHERE standard (<15%). 73.0% of programmes achieved the SPHERE standard. The data range is large at 36.2% (0.0% to 36.2%), with two records above 30.0%. Only one record failed to record a defaulter rate (n=63).</i>	DEATH RATE <i>The median death rate of programmes implemented between 2000 and 2006 was 4.1%. This is lower than the SPHERE standard (<10%) and 95.3% of programmes in this period achieved it. However, the data range is 14% (1.0% to 15.0%) so some high death rates were reported during this period.</i>
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These early results demonstrate that the decentralisation of SAM treatment did not come at the expense of quality. The median cure, defaulter and death rates for this period all achieved SPHERE minimum standards. There were a number of very high performing programmes with reported cure rates of 95.0% (n=2), defaulter rates of 0.0% (n=2) and death rates of 1.0% (n=4). These show that the model was capable of achieving optimal programme outcomes. However, some low cure rates (50.0%) and high defaulter and death rates (36.2% and 15.0%) suggest that achieving optimal outcomes required specific conditions and practices.

The efficacy of early community-based SAM treatment programmes was crucial as this led to its eventual, wider uptake. Early programmes proved that it was safe. This in turn facilitated the process of bringing the medical community on-board with these decentralised approaches, which would prove essential within the Ministries of Health and other National Health Service providers. In doing so, meeting SAM needs would increasingly be defined less by the clinical outcomes and more by the capacity to put treatment within reach of the highest number of cases. (see box 1)

² See Annex 3 for a full list of records used

³ When collating/analysing the dataset, the review encountered the following limitations:

- 1 programme data is not systematically and accurately reported;
- 2 data is not disaggregated by gender;
- 3 clinical outcomes are calculated inconsistently (vis-à-vis admissions or exit figures);
- 4 clinical outcome indicators are reported inconsistently;
- 5 Transfers are often included in outcome indicators;
- 6 programme sample size was often not consistently included.

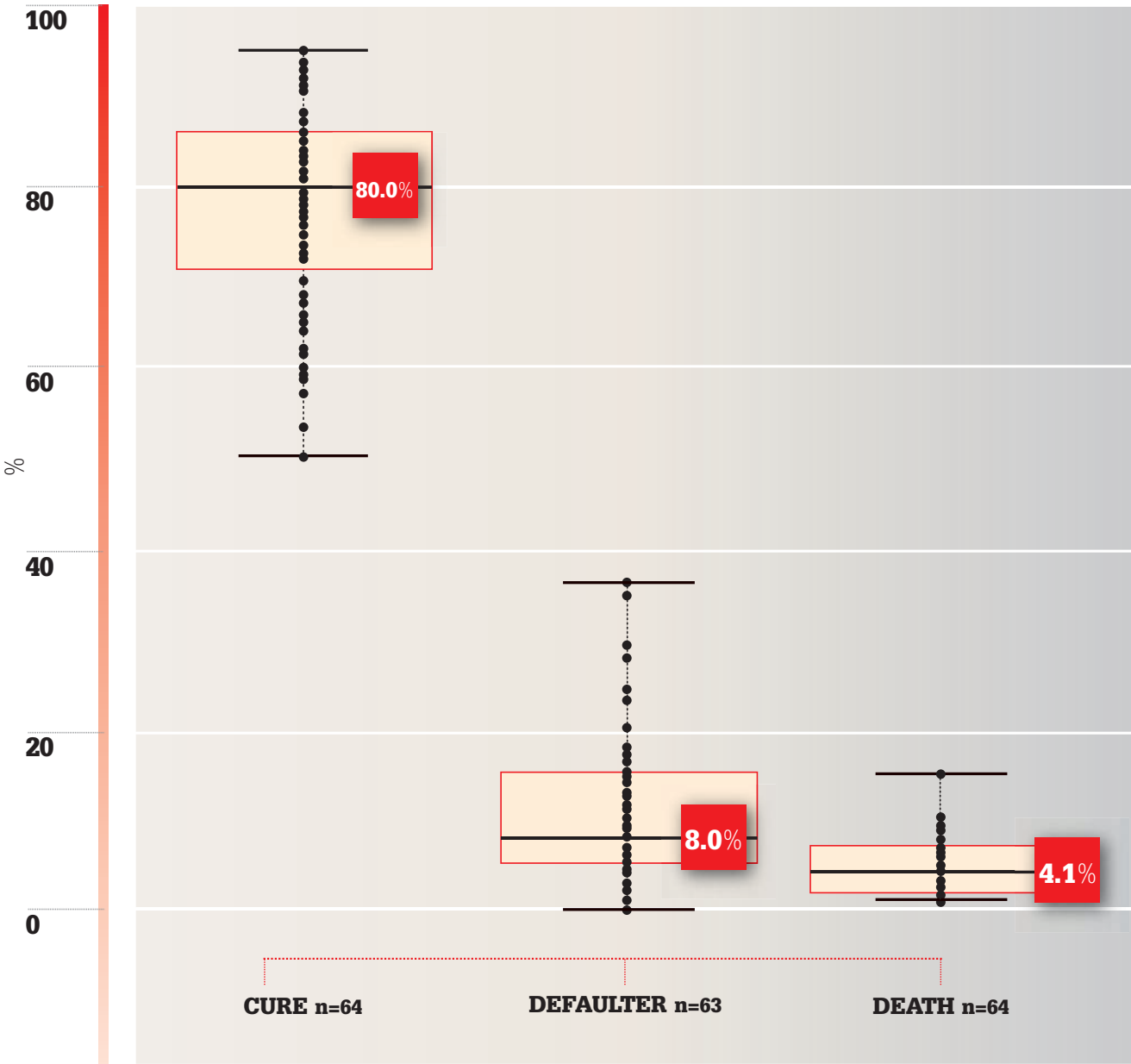
As a result: This review has not included an analysis of the non-recovery rate, weight gain or length of stay as this information has not been systematically recorded in published data used in this review.

- Programmes implemented during the CTC R&D phase are included. These received intensive financial and human resources which later programmes did not receive.
- 26 out of 64 programmes are from either Ethiopia or Malawi. Both of these countries received considerable external support in the early phase of CTC implementation.
- Organisations publishing the data publicly may have favoured successful programme data. Underperforming programmes may not have been reported.
- Programme (sample) size has not been accounted for so larger programmes with poor results would have a greater impact than smaller programmes with good results.

⁴ The median is the value lying at the mid-point of a frequency distribution of values. The range shows the variation between the highest and lowest values.

FIGURE 3

Clinical Outcomes 2000-2006 multiple records.



Clinical Outcomes

Coverage

The SPHERE minimum standards for coverage, developed during the early days of community-based SAM treatment (and set at >50% for rural, >70% for urban and >90% for camp settings) (43) reflected the anticipated levels of success expected from this approach. Did programmes implemented directly by NGOs succeed in reaching a high proportion of SAM cases?

BOX 3 » How to measure coverage

Demonstrating the capacity of CTC to deliver on the promise of high coverage became a key objective during the early years of implementation. To do so, reliable coverage assessment methodologies would need to be created. Developed by M. Myatt (Brixton Health) and Valid International, the first such method was the Centric Systematic Area Sampling (CSAS). (44, 45) Since then, and with the support of the Food and Nutritional Technical Assistance (FANTA), additional methods including the Semi-Quantitative Evaluation of Access and Coverage (SQUEAC) and Simplified Lot Quality Assurance Sampling Evaluation of Access and Coverage (SLEAC) have been developed. (46) These tools have provided valuable insight into the coverage of CTC programmes as well as the barriers and boosters that define the coverage achieved.

A review of coverage surveys carried out by different NGOs between 2001 and 2006 provides valuable evidence about the coverage achieved by community-based SAM treatment programmes in both rural (n=19) and camp settings (n=1). The overall median point coverage is 35.8% (n=20) with a range of 72.3% (6.0% to 78.3%). The median period coverage is 62.6% (n=16) with a range of 87.5% (8.9% to 96.4%) with one programme reporting period coverage close to 100.0% (see Figure 4)⁵.

A third of these programmes achieved coverage rates higher than their relevant SPHERE minimum standards. The decentralised approach coupled with regular detection and case-finding, meant that the model had the potential to reach unprecedented levels of the affected population. Compared to previous centralised approaches, the median point coverage of 35.8% was a remarkable improvement. (45) High coverage, combined with good clinical outcomes, meant that programmes could effectively meet more needs than ever before.

The data from this period also provides a less evident but equally important point. Low coverage rates (6.0-7.0%) recorded during this early period suggest that the quality of programmes was only as good as the quality of support it received from its implementers⁶. The decentralisation of care improved availability but did not ensure accessibility. For the full potential of community-based SAM treatment to be realised, specific activities to enhance and facilitate access needed to be undertaken.

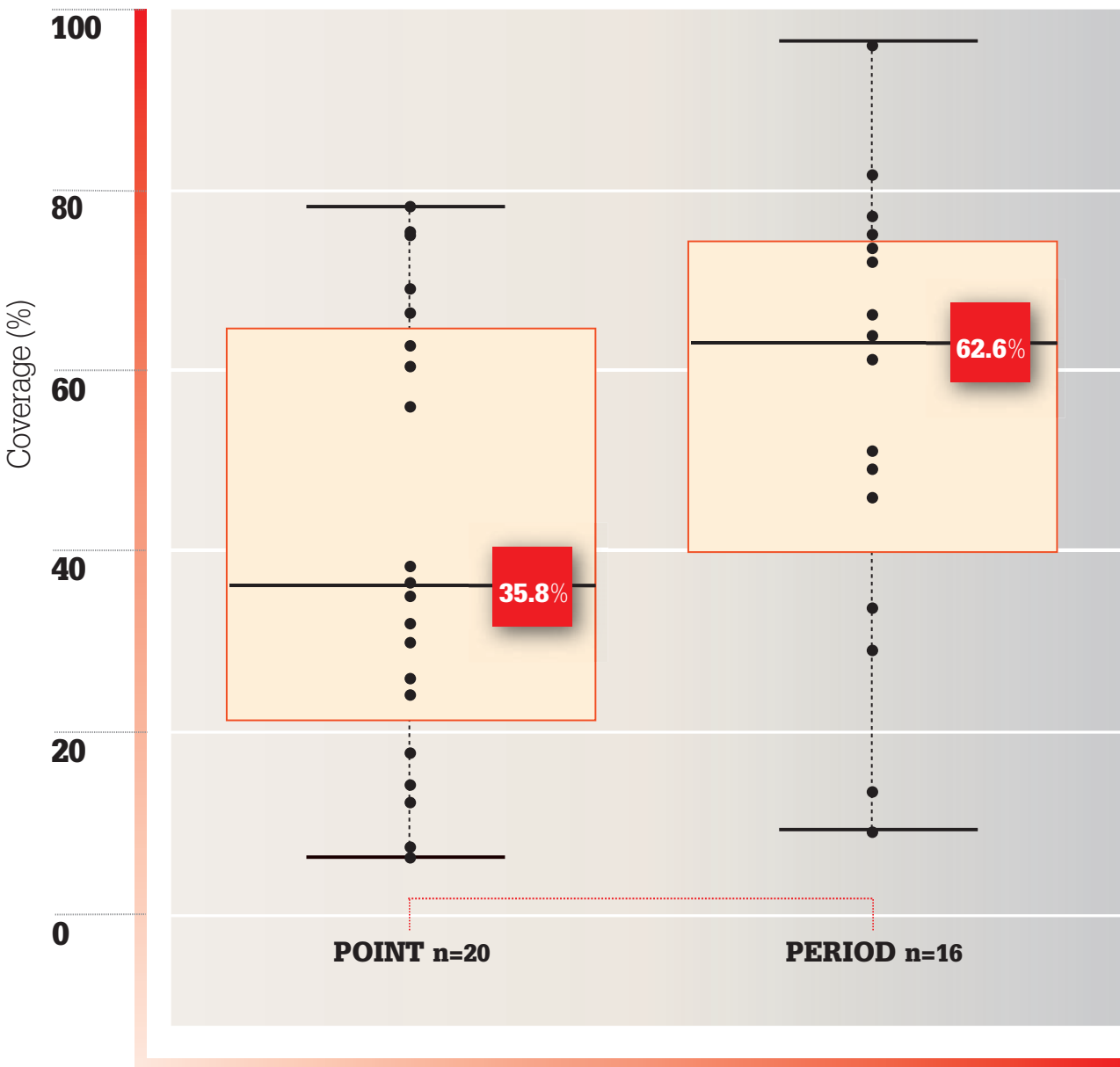
⁵Coverage surveys/assessments can produce two coverage estimates. Point coverage which uses current cases only, and period coverage which uses both current recovering cases (i.e. children that should be in the programme because they have not yet met the discharge criteria). Point coverage provides "...a snapshot of program performance and places a strong emphasis on the coverage and timeliness of case-finding and recruitment". (46) The overall coverage estimation varies depending on the estimator. Both point and period coverage can potentially reward/penalise

programmes and "...results can be difficult to interpret without contextual information" (46). Current coverage surveys/assessments select and report only one of these coverage estimations based on the appropriateness and relevance in each context.

⁶A review of additional documentation from low reporting programmes did not identify additional, extraordinary contextual factors that would have contributed to the low rates recorded.

FIGURE 4

Coverage estimations (2000-2006).



Coverage Type

12 NGO-Implemented programmes

Cost-Effectiveness

By moving away from a fixed-capacity model, CTC was also designed to offer more cost-effective treatment. Prior to the introduction of the community-based SAM treatment model, few studies were conducted to assess the most cost-effective type of intervention for treating SAM, comparing home based care with clinic based care. (47-49) These early assessments, which looked at different models of home based care and focused purely on monetary costs incurred by implementer and carer, generally found home based care to be the most cost-effective option. (50)

With the arrival of CTC, cost-effectiveness assessments began to provide more in-depth and useful analysis of costs of SAM treatment. Early cost comparisons of TFCs with the first CTC programmes showed that the cost of rehabilitating a SAM child under the CTC model was lower than in a TFC (€255 to €301 per child in CTC compared with €355 per child in TFC⁷). (20) Subsequent and more comprehensive research also took into account indirect costs, by employing a societal perspective in the retrospective cost-effectiveness analysis. (51) Effectiveness was measured by comparing cure rates⁸ on patient follow-up care records that were very similar for each program (TFC: 95.36%, CTC: 94.30%). At \$128.58 per child in CTCs, the institutional⁹ costs for treating a child were lower than in TFCs, which averaged at \$262.62. Similar results were seen when a monetary value was attached to indirect costs, where it was shown that the CTC model cost considerably less per child treated at \$5.87 per carer compared to TFCs costing \$21.01. (51)

These analyses found CTCs to be twice as cost-effective as TFCs and four times more cost-effective for the caretakers. The

BOX 4

» 3 Challenges in comparing the cost effectiveness of CTC with TFC

- 1 **CTC was designed as a comprehensive, multi-level model which includes inpatient and outpatient SAM treatment, MAM treatment and community mobilisation activities. These elements were implemented as one, making separation of individual costs and investments difficult.**
- 2 **The use of direct costs as the sole metric also fails to recognise the broader societal perspective or the indirect costs (opportunity costs) on the community.**
- 3 **Economies of scale of CTC programmes means relatively high initial fixed costs (recruiting, training, equipping mobile teams, interacting with and mobilising communities), yet expanding services only requires food and medicine costs. (16)**

reduction of opportunity costs meant that a greater number of families would be able to afford SAM treatment. CTC made community-based SAM treatment more affordable and thus more accessible than the previous model.

The combined good clinical outcomes, higher coverage and cost-effectiveness demonstrated that when implemented properly, community-based SAM programmes could meet more needs than ever before. But could it continue to do so when implemented at scale?

FIGURE 5 Cost-effectiveness of SAM treatment within a CTC programme in Ethiopia.

● Institutional cost per recovered case	TFC	\$262.62	CTC	\$128.58
● Opportunity costs for caretakers, per recovered case	TFC	\$21.01	CTC	\$5.87

Source: Tekeste A, Wondafrash M, Azene G, Deribe K. 2012 (51)

⁷ Based on a standalone TFC intervention.

⁸ A patient was categorised as cured if discharged fulfilling the criteria of weight-for-height $\geq 85\%$ for two consecutive weighing and no oedema for ten days.

⁹ Costs of running CTCs are dependent on the following factors: density and prevalence of severe malnutrition, infrastructure present, the accessibility and

maturity of the emergency and availability of locally produced RUTF. In the TFC/CTC comparison study, the cost of therapeutic food per child was \$42.94 for TFCs and \$55.53 for the CTC. However, the total therapeutic food needs of the CTC made up 43.2% of the institutional costs per child while for the TFC it was only 16.3%.

In 2007, following the WHO/UNICEF/WFP/UNSCN Joint Statement, community-based treatment of SAM (under the rebranded Community-based Management of Acute Malnutrition, CMAM) was rolled out across a number of countries. Labelling aside, treatment services were built on the same key principles: delivering high quality care to the highest proportion of the SAM-affected population, through the promotion of early presentation and the treatment of uncomplicated SAM cases on an outpatient basis using RUTFs. The high performance of early community-based SAM treatment programmes was an integral part of the reason for its scale-up and integration into national health systems. But have integrated community-based SAM treatment services continued to deliver similar levels of performance?

Clinical Outcomes

An analysis of publicly available records¹⁰ on MoH integrated programmes implemented between 2007 and 2013 (n=23) provides evidence to demonstrate good clinical outcomes, comparable to early NGO implemented programmes.

CURE RATE
The median cure rate for MoH-integrated programmes is 84.0% (n=23) which is 4% higher than the previous NGO-implemented programmes (80.0%, n=64). 78.3% of the results reviewed were above SPHERE's minimum standards (>75%) with 34.8% of the results exceeding 90% cure rates. However, there is a large range of 48% (51.0% to 99.0%) almost the same as the early NGO-implemented programmes (45%). In nearly every regard, integrated services are achieving equally or better cure rates than programmes prior to 2007.

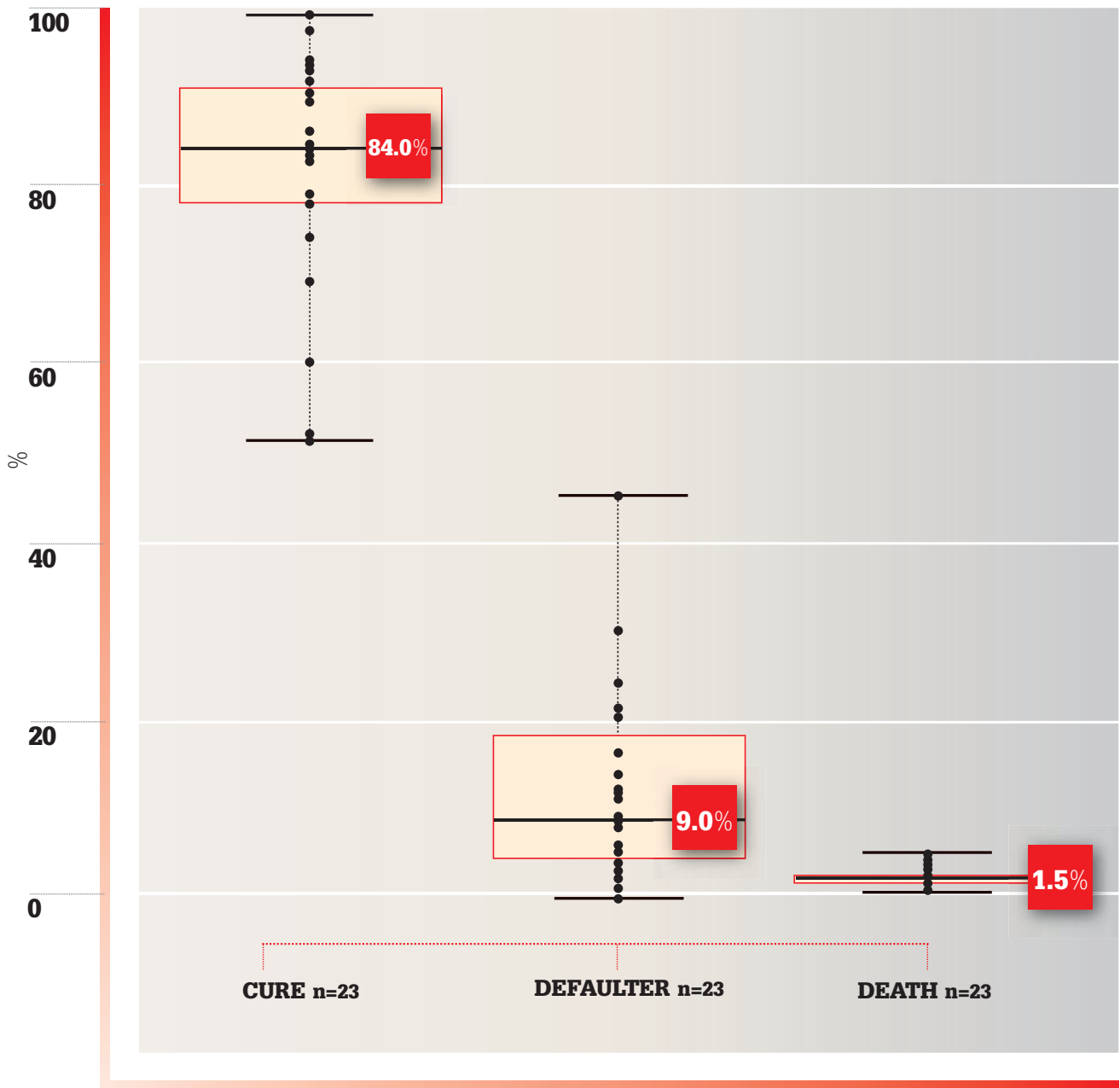
DEFAULTER RATE
The median defaulter rate was 9% which is similar to early NGO-implemented programmes (8%). 69.6% of programmes achieved SPHERE standards (<15%). There was a large range of 45% (0.0% - 45.0%) with 6 out of the 23 programmes reporting high defaulter rates, greater or equal to 20%.

DEATH RATE
The median death rate is 1.5% with a range of 4% (0.0% to 4.0%) which is lower than the median rate of NGO supported programmes (4.1%). All (100%) of the programmes in the sample met SPHERE minimum standards (<10%), compared with 95.3% of early, NGO-supported programmes.

These results show that performance in integrated programmes is comparable to that of early NGO-implemented programmes. The medians for cure and defaulter rates show little variation, in spite of the different management structures and contexts. In fact, a greater proportion of integrated services achieved SPHERE standards for cure rates (78.3% compared to 68.8%). Additionally, the death rate was notably lower in more recent programmes, showing improved clinical performance in recent years. But have integrated services succeeded in delivering these good clinical outcomes to a high proportion of the affected population?

FIGURE 6

Clinical Outcomes 2007-2013.



Clinical Outcomes

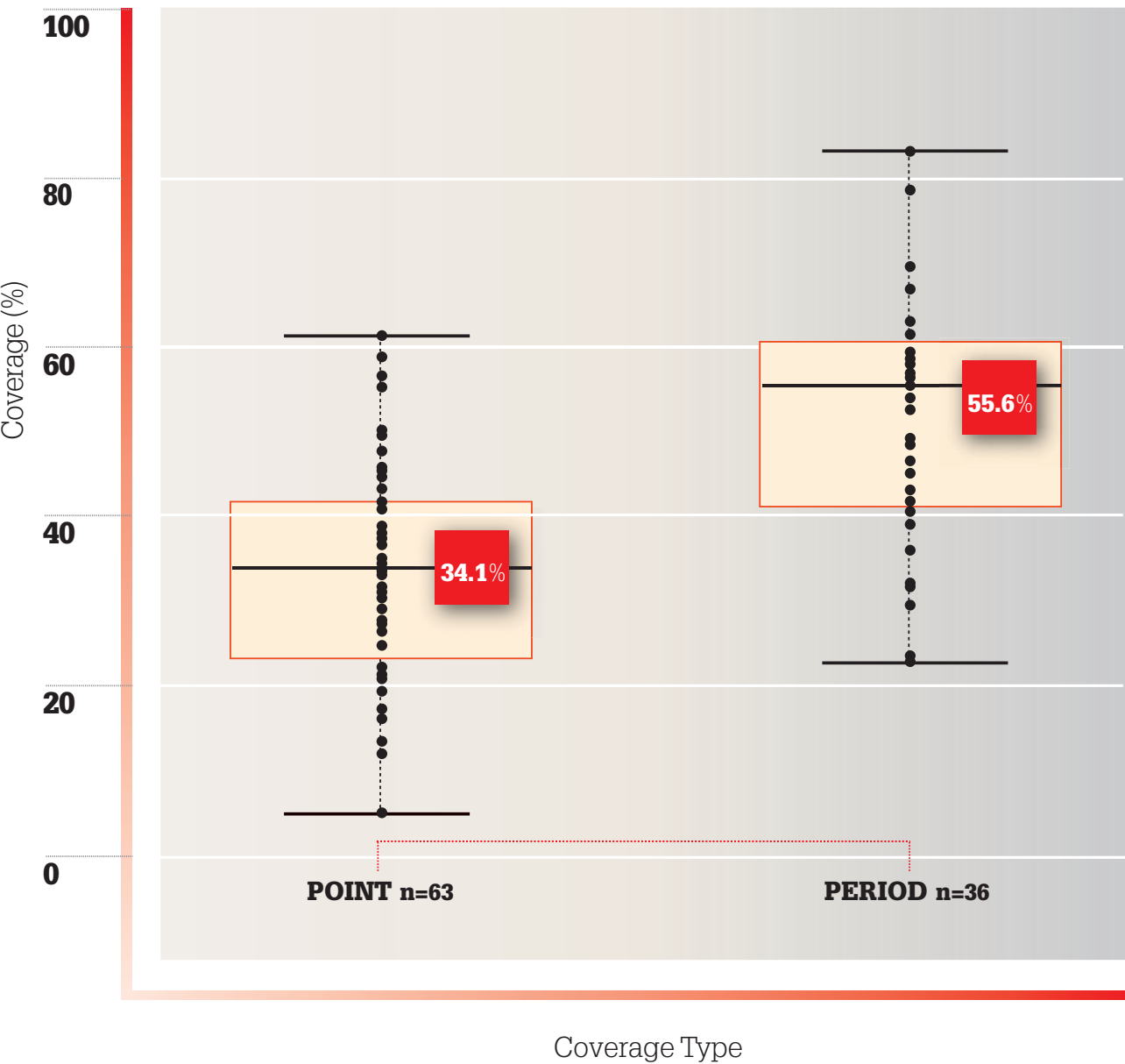
¹⁰ See Annex 3 for a full list of records used

Coverage

The introduction of easy-to-use coverage assessment techniques in 2008 significantly increased the availability of coverage data for MoH-integrated services implemented during this period. This large dataset (n=71), 8 in rural (n=58), urban (n=11) and camp (n=2) settings, provides valuable insights into the performance of programmes. The median point coverage for MoH-integrated programmes is 34.1% (n=63) with a range of 56.2% (5.1%-61.3%). The median period coverage is 55.6% (n=36) with a range of 60.4% (22.8% to 83.2%). A comparison shows little difference from the median point coverage of NGO-implemented programmes (35.8%). The median period coverage rates also have little variation, with NGO programmes having a median of 62.6%.

This analysis shows that although the proportion of the SAM population reached was considerably higher than with previous centralised models, community-based SAM treatment failed to consistently achieve the high levels of coverage initially expected. **The number of "coverage failures" is also increasing; 40% of NGO-implemented programmes (n=8, point coverage) achieved coverage >50%, while only 7.9% of MoH-implemented programmes (n=5) reached the same threshold.** The difference is further accentuated when a higher threshold is used (>70%); only 15% (n=3) of NGO implemented programmes achieve this and no MoH-implemented programmes to date has reported such levels of point coverage. These results suggest that although MoH-implemented programmes are potentially capable of reaching a high proportion of the SAM population, the operational conditions to do so are seldom met.

FIGURE 7
Coverage estimations 2007-2013.



Cost-Effectiveness

There are only two published studies evaluating the cost-effectiveness of MoH-implemented community-based SAM treatment. In Malawi the cost-effectiveness ratio of implementing specific SAM services within existing health services was estimated to be \$42 per Disability Adjusted Life Year (DALY) averted,¹¹ which WHO classifies as a highly cost-effective intervention. (53) A similar study in Zambia also supported these findings showing the cost of each DALY averted to be \$53. (54) These are considered cost-effective in comparison with other priority child health interventions in developing countries. (54,55) There is also a growing body of operational evaluations providing further evidence.¹² In 2012 UNICEF undertook two country wide evaluations in Nepal and Pakistan which included cost analyses of SAM treatment. In Pakistan the average cost per beneficiary was \$145 (OTP) and \$230 (SC), (56) and in Nepal, the cost per beneficiary was slightly less for OTP varying from \$125 per child down to \$56.¹³ (57) This suggests that further cost reductions have been made since the early CTC programmes (€255 to €301 per child). As expected, RUTF was a significant proportion of total programme costs. **This data shows that community-based SAM treatment at scale continues to be a low cost and cost-effective intervention.**

¹¹This was under the 'base case' scenario for each variable. The worst case scenario would have increased the cost to \$493.
¹²Cost per beneficiary figures are dependent on a number of contextual factors and the methods of calculation can vary greatly.
¹³ Depending on the variation in capital costs and the rate of SAM. No SC data available.

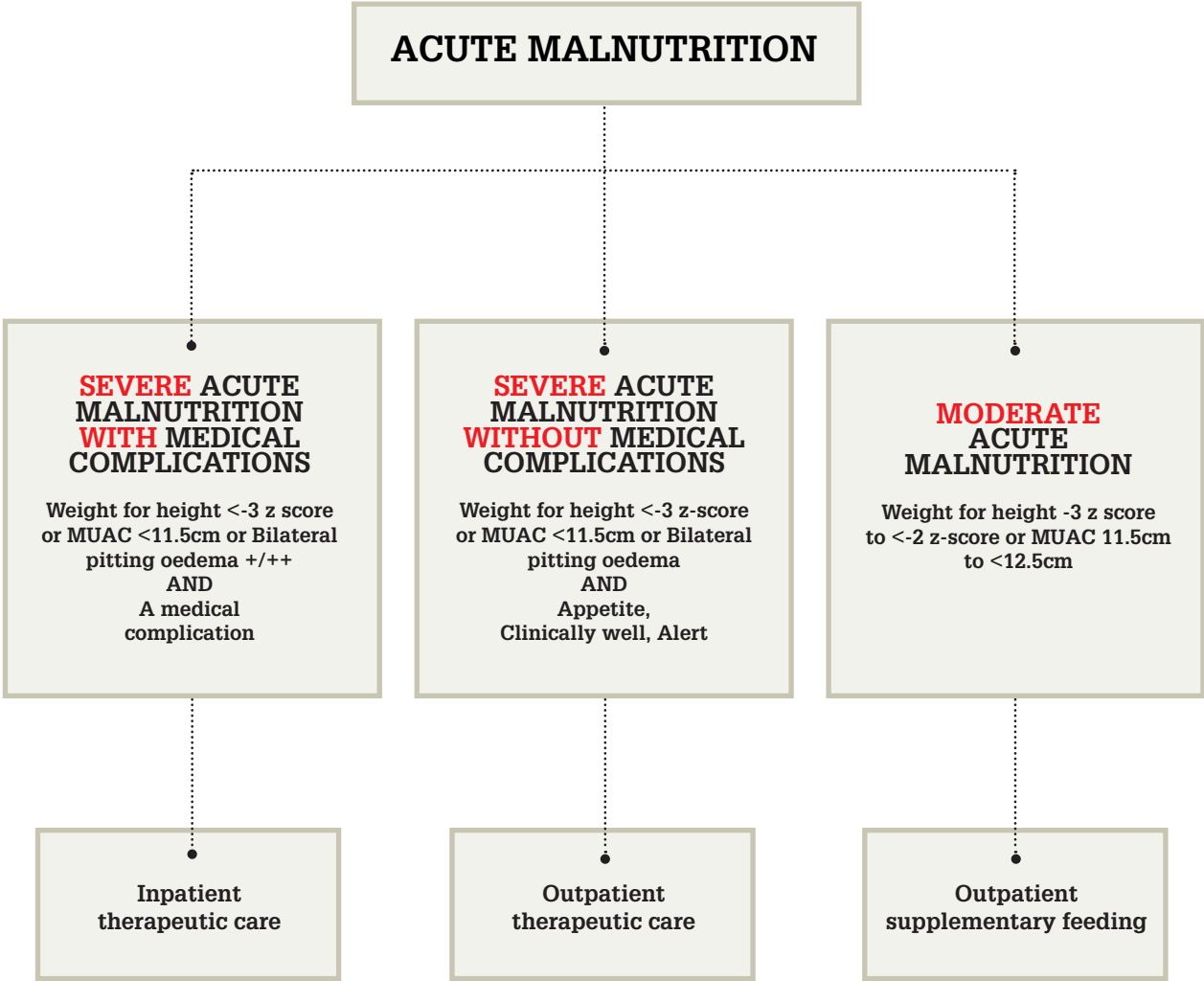
Community-based SAM treatment has the potential to deliver cost-effective treatment with a good standard of care to a high proportion of the SAM affected population. Community-based clinical outcomes can deliver exceptional results comparable with the previous (high performing) TFC programmes, with cure rates greater than 90.0% and defaulter and death rates close to 0.0%. The cure rate medians (80.0% and 84.0%) confirm the quality of the treatment protocols used and suggest that while these can still be optimised, (58) their overall efficacy is unlikely to be easily improved further. Available research shows the community-based model to be cost-effective with a low cost per DALY, and recent evaluations show that MoH-implemented services continue to

be low cost interventions. Consistently achieving optimal levels of coverage remains a challenge. Since the introduction of community-based SAM treatment models, only a handful of (mostly NGO implemented) programmes have achieved high coverage rates. In recent years, there have been large variations in the proportion of cases reached by MoH-delivered services, with most failing to reach minimum standards (i.e. <50%). This suggests that access (including both uptake and adherence) remains a key challenge. Ensuring that community-based SAM treatment services remain cost-effective and capable of meeting needs at scale depends on levels of coverage being significantly and consistently improved.

VOLUME TWO of this three-part series will look closer at the issues affecting the coverage of community-based SAM treatment services. This follow-up volume will bring together primary and secondary data from around the world to tackle the questions, what prevents SAM cases from reaching treatment services and what needs to be done for the coverage of community-based SAM treatment to improve?



Annex 1: Updated classification of malnutrition for Community-based Management of Acute Malnutrition.



Source: Harmonised Training Package, 2011. (59)

Annex 2: Coverage Data by Country.

NGO-supported programmes (2000 - 2006)			
COUNTRY	LOCATION	YEAR	SETTING
DRC Ethiopia	Djugu	2006	Rural
	Kalu	2003	Rural
	Bedeno & Kurfachele	2004	Rural
	Hulla & Arbegona		Rural
	W. Hararghe		Rural
	Lanfaro	2005	Rural
	Wollo		Rural
	Awassa Zuria	2006	Rural
	Boricha		Rural
	Dehana		Rural
Kenya Malawi	Konso		Rural
	Wajir	2006	Rural
	Dowa	2003	Rural
	Dowa	2004	Rural
	Lilongwe	2006	Rural
Niger South Sudan Sudan	Mangochi		Rural
	Maradi	2006	Rural
	Aweil W. & N.	2004	Rural
	W. Darfur	2005	Camp
	N. Kivu	2006	Rural

MoH-supported services (2007-2013)			
COUNTRY	LOCATION	YEAR	SETTING
Afghanistan	Herat	2010	Rural
	Kabul	2012	Urban
Burkina Faso	Kaya	2010	Urban
	Kaya	2010	Rural
	Tapoa	2010	Rural
	Tapoa	2011	Rural
	Pama	2012	Rural
	Tapoa	2012	Rural
	Yako	2013	Rural
Burundi	Kayanza	2007	Rural
	Muyinga	2007	Rural
Cameroon	Urbain Maroua District	2013	Urban
Chad	Kanem	2010	Rural
	Bahr el Gazal	2011	Rural
	Kanem	2011	Rural
	Bahr el Gazal	2012	Rural
	Kanem	2012	Rural
Côte d'Ivoire	Batha Region	2013	Rural
	Danane	2012	Rural
	Tonkpi	2012	Rural
	Toulepleu	2012	Rural
DRC	Maniema	2007	Rural
	Popokabaka	2012	Rural
Ethiopia	Kisantu	2013	Rural
	Durame	2007	Rural
	Kenyabata Tembaro Zone	2007	Rural
	Gode Zone	2007	Rural
	Bona Woreda	2008	Rural
	Dogua Temben	2011	Rural
	Medebay Zana	2011	Rural
	Tahtay Adyabo	2011	Rural
	Dolo Camp	2012	Camp
Haiti	Haut Artibonite	2011	Urban
	Port-au-Prince	2012	Urban

COUNTRY	LOCATION	YEAR	SETTING
Kenya	Turkana	2009	Rural
	Turkana S. District	2010	Rural
	Isiolo	2012	Rural
	Laikipia County	2012	Rural
	West Pokot	2012	Rural
Liberia	Monrovia	2011	Urban
	Gao	2008	Rural
Mali	Gao	2011	Rural
	Kayes	2013	Rural
Mauritania	Guidimakha	2012	Rural
Myanmar	Maungdaw	2011	Urban
Nepal	Saptari District	2013	Rural
Niger	Zinder	2007	Rural
	Tessaoua	2010	Rural
	Keita	2012	Rural
	Keita	2013	Rural
	Maradi	2013	Rural
	Gombe State	2010	Rural
	Fune LGA	2011	Rural
	Damaturu LGA	2012	Rural
	Tando Mohammad	2013	Rural
Pakistan	Gisagara	2012	Rural
Rwanda	Matam	2012	Rural
Senegal	Moyamba	2012	Rural
Sierra Leone	Galckayo Puntland	2012	Rural
Somalia	Mogadishu	2012	Urban
	Tonj S. County	2009	Rural
South Sudan	Aweil East	2011	Rural
	Gogrial West	2011	Rural
	Twic	2011	Rural
	Kapoeta	2012	Rural
	W. Darfur	2012	Urban
Sudan	Lira, Oyam and Apac	2008	Camp
	Kaabong	2011	Rural
	Moroto	2011	Rural
Uganda	Lusaka	2007	Urban
	Lusaka	2008	Urban

Annex 3: Efficacy Data by Country.

NGO-supported programmes (2000 - 2006)		
COUNTRY	PROGRAMME START	SOURCE
Ethiopia	2000	» Collins et al, 2005; Collins, 2007
	2003	
	2004	
	2004	
	2005	
Kenya Malawi	2006	» Tappis et al, 2012
	2002	
	2003	
	2004	
	2005	
	2004	
	2005	
Niger	2006	» Kathumba, 2012
	2001	
	2002	
	2003	
	2004	
	2005	
	2005	
South Sudan	2005	» Collins et al, 2005; Collins, 2007
	2005	
	2006	
	2006	
	2006	
Sudan	2003	» Defourmy et al, 2006
	2003	
	2004	
	2004	
	2005	
Tanzania	2004	» Collins et al, 2005; Collins, 2007
	2004	
	2004	
	2004	
	2006	» Tectonidis, 2006
	2006	
	2009	» Lapidus et al, 2009
	2009	
	2004	» Walker, 2004
	2004	
Sudan	2003	» Collins et al, 2005; Collins, 2007
	2003	
	2004	
	2004	
	2005	
Sudan	2001	» Collins et al, 2005; Collins, 2007
	2002	
	2002	
	2004	
Tanzania	2004	» Katumwa, 2007
	2006	
	2006	» Tappis et al, 2012
	2006	

MoH-supported services (2007-2013) ¹³		
COUNTRY	PROGRAMME START	SOURCE
Burkina Faso	2007	» Goossens et al, 2012
	2009	
	2010	
Côte d'Ivoire	2009	» Celestin and Rizzi, 2010
	2009	
DRC	2008	» Schwartz and Grellety, 2010
	2008	
	2009	
Ethiopia	2007	» Schwartz et al, 2010
	2007	
	2008	
Ghana	2008	» Tekeste et al, 2011
	2008	
	2009	
Malawi	2009	» Chamois, 2011
	2010	
	2010	
Mauritania	2007	» Neequaye and Okwabi 2012
	2007	
	2007	
Sierra Leone	2007	» Wilford et al, 2011
	2007	
	2008	
	2008	» Kathumba, 2012
	2008	
	2009	» Deconinck et al, 2010
	2009	
	2010	» Schwartz and Grellety, 2010
	2010	
	2010	» Koroma et al, 2012
	2010	

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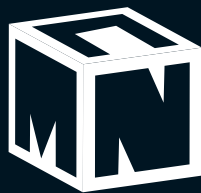
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