

# Evaluation of Community-Based Management of Acute Malnutrition Performance Indicators in Gombe, Enugu, and Ebonyi States of Nigeria between 2015 and 2023

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## ABSTRACT

**Background:** Community-Based Management of Acute Malnutrition (CMAM) is a proven approach for treating Severe Acute Malnutrition (SAM) in children 6-59 months. Despite its existence in Nigeria, programme performance remains unclear.

**Objective:** The study was designed to evaluate CMAM performance indicators in Gombe, Enugu, and Ebonyi states, Nigeria, from 2015 to 2023.

**Methodology:** A retrospective, multi-stage survey was conducted across 12 CMAM centers in nine Local Government Areas (LGAs). Data were extracted from 1,966 Outpatient Therapeutic Programme Cards of SAM cases (aged 6-59 months), District Health Information System (DHIS2), and facility records. Data were analyzed using IBM SPSS software version 23, with a statistical significance level accepted at  $p < 0.05$ .

**Results:** CMAM was established in Gombe (2009) and Ebonyi & Enugu (2020), with 64.0%, 23.0% and 18.0% LGA coverage, respectively. New SAM enrolment was 34.1% in Gombe, 8.7% in Enugu, and 6.5% in Ebonyi, with females comprising 51.1-56.3% of new cases, 34.2% new admission rate (Gombe), and 0.4% transfer-in (Enugu). The primary admission criterion was MUAC screening (96.9%). Cure rates were 91.0% (Ebonyi), 86.8% (Gombe), and 67.9% (Enugu). Default rates were highest in Enugu (30.4%) and Gombe (10.2%), and 75% had low weight gain in Enugu. Average length of stay was 37 days (Gombe/Enugu) and 84 days (Ebonyi).

**Conclusion:** The CMAM programme exhibited poor performance across the three states, characterized by low coverage, high default rate, sub-optimal cure rates, and low weight gain. Hence, there is a need for robust supervision of the CMAM services, training, and funding of the programme in Nigeria.

**Keywords:** Severe acute malnutrition, Community-based management, Cure rate, Default rate

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## INTRODUCTION

Globally, Community Management of Acute Malnutrition (CMAM) is a recognized approach for Severe Acute Malnutrition (SAM) treatment. It provides timely and effective treatment of SAM and thus reduces the risk of morbidity and mortality (1, 2). Community-based management of acute malnutrition (CMAM) comprises four core components, namely: community mobilization, inpatient

care, outpatient therapeutic care, and supplementary feeding programme.

Community mobilisation involves active case finding through screening and awareness creation (3); inpatient care focuses on treatment of SAM children with medical complications at health facilities and outpatient therapeutic care treats SAM children without complications with Ready-to-Use Therapeutic Foods (RUTF) at home or in community settings (4); while the supplementary feeding

programme manages children with moderate acute malnutrition using supplementary or fortified foods [5].

The CMAM programme was introduced to Nigeria in 2009, with pilots in Gombe and Kebbi states (6), and was scaled to 11-12 northern states where malnutrition rates are highest, with over one million children treated between 2009 and 2014 (7). The programme brings services closer to families, with projections that more than 85% of SAM children could access treatment at home or in community settings rather than through a facility-based approach (1). However, only 20% of SAM children have access to treatment at CMAM facilities in Nigeria (8), with few (2.8%) treated with RUTF (9), while about 67% of SAM cases in Northern Nigeria were unable to access treatment as of 2013 (7). Performance indicators for Community-Based Management of Acute Malnutrition in Nigeria measure the services' effectiveness, efficiency, and success in achieving its strategic goals. It provides essential data for tracking progress, evaluating, supporting decision-making, driving policy action, and setting standards. Key performance indicators of programme success include treatment outcomes categorized as cured, defaulted, died, or non-respondent (10, 11).

The CMAM programme in Nigeria faces performance challenges, including low coverage (approximately 20-37% of the SAM burden), high default rates, poor treatment outcomes, and sustainability issues (1, 2, 12-14). These results are from over-reliance on international funding and limited supply of RUTF, high relapse risk of cured SAM children, and poor programme data reliability, which often provides a misleadingly good impression of performance (1, 2). Some of the key challenges confronting CMAM performance are stock-outs of RUTF, long distance to treatment facilities limiting access for rural families, inadequate capacity building of health workers on protocol adherence, and community beliefs that conflict with treatment protocols, leading to low compliance.

Nigeria has an unacceptably high burden of malnutrition, with the highest rates of malnutrition particularly in the northern states (9). Globally, approximately 42.8 million children under five experienced wasting in 2024 (15), with 12.2 million severe cases, 70% of which were in Africa (15). In Nigeria, over 3.5 million children under five were diagnosed with SAM in 2024, a 22% to 67% increase in cases reported in some areas compared to previous years, with over one million severely acute malnourished children expected to require

urgent, lifesaving care (16). Nigeria has a worrisome situation as a nation with the highest burden of child malnutrition rates globally, with over 79% of households experiencing food insecurity (17) and nearly 25 million people at risk of food insecurity in 2023. The situation is most critical in the North-East and North-West due to conflict, economic hardship, and climate-induced food insecurity (9). A child with SAM is twelve times more likely to die than a healthy child (4,8,12), underscoring the urgency of strengthening CMAM services. Understanding what works and the current CMAM programme in Nigeria is important for strengthening and scaling up the programme; therefore, this study was designed to evaluate the CMAM performance indicators in Gombe, Enugu and Ebonyi states of Nigeria between 2015 and 2023.

## METHODS

### Areas of Study

The study was carried out across three states in Nigeria: Ebonyi and Enugu states in the South-East geopolitical zone and Gombe State in the North East geopolitical zone. CMAM programme was established in 7 LGAs in Gombe, 3 LGAs each in Enugu and Ebonyi states. Three Local Government Areas (LGAs) in Ebonyi (Ezza South, Abakaliki, and Afikpo North), two in Enugu (Udenu and Orij River), and four in Gombe State (Akko, Gombe, Kaltungo, and Kwami), all in Nigeria, were purposively selected for the study to represent contrasting ecological and cultural contexts for acute malnutrition in Nigeria.

### Study Design and Population

The study employed a non-experimental, retrospective descriptive survey design. The study analyzed the existing quantitative and qualitative data on CMAM services and outcomes of severely acute malnourished children aged 6 to 59 months enrolled in the selected 12 CMAM centers in the three states (Gombe, Ebonyi, and Enugu) between 2015 and 2023. Data were extracted from the District Health Information System (DHIS2) and Outpatient Therapeutic Programme (OTP) Cards. The study population comprised children aged 6-59 months enrolled in the CMAM programme in Gombe, Ebonyi and Enugu States between 2015 and 2023 on account of severe acute malnutrition (SAM).

### Sample Size and Sample Selection

A multi-stage sampling technique was employed to select 12 CMAM centres from nine LGAs across three senatorial zones in the three states (Gombe, Ebonyi and Enugu). From these centres, a total of 1966 OTP cards of SAM children aged 6-59

months and 164 from each of the 12 facilities between 2015 and 2023 were selected through a systematic sampling method and used as the primary data source. Inclusion criteria: The selection focused on available and complete OTP cards of Children aged 6-59 months, enrolled due to uncomplicated severe acute malnutrition (SAM), diagnosed based on SAM management protocols of MUAC < 11.5 cm, bilateral pitting edema, or weight-for-height < -3 SD, in the selected OTP facilities within the designated study states from 2015 to 2023.

Exclusion criteria: Unavailable and incomplete OTP cards; children younger than 6 months or older than 59 months; children with severe medical complications and not enrolled in the selected study facilities; and children enrolled before 2015 or after 2023 were excluded from the study to ensure a uniform cohort.

### Ethical Consideration

Ethical approval with reference number NHREC/01/01/2007-29/12/2023<sup>1</sup> was obtained for the study from the National Health Research Ethics Committee of Nigeria. Approval from the Executive Secretary of the State Primary Health Care Development Boards and the Directors of Primary Health Care Centers was obtained after the study objective and methodology were explained before the study commenced.

### Data Collection

Data collection was carried out by six trained research assistants (University graduates) recruited from the three states, with two research assistants assigned to each state, after the preliminary visit to the states and centres. Data were extracted from OTP cards of SAM children and the DHIS2 platform using Computer-Assisted Personal Interviews (CAPI) through the KoboCollect application on a mobile phone. Anthropometric indices, mortality rates, and cure rates were calculated using the Emergency Nutrition Assessment (ENA) Software in conjunction with the Standardized Monitoring and Assessment of Relief and Transitions (SMART) data tools.

Enrolment criteria were age (6-59 months), good appetite test, screening for SAM using MUAC measurement < 11.5 cm; Screening for pitting edema; and weight and height/length measurement and determination of weight for- height index

of < -3 SD. These measurements were taken by health workers and recorded in the OTP cards of the children.

The performance indicators were calculated as follows;

Cure rate (%) is the proportion of children who complete treatment and are discharged as recovered =

$$\frac{\text{Number of children cured that month} \times 100}{\text{Total number of children who ended treatment that month}} \\ \text{specific indicator} > 75\%$$

Death rate\* (%) is the proportion of children who die during treatment =

$$\frac{\text{Number of children who died that month} \times 100}{\text{Total number of children who ended treatment that month}} \\ \text{specific indicator} < 10\%$$

Default rate (%) is the proportion of children who do not complete treatment or are lost to follow-up =  $\frac{\text{Number of children absents for three consecutive sessions} \times 100}{\text{Total number of children who ended treatment that month}}$  specific indicator < 15%

Non-Recovery rate (%) is the proportion of children who do not recover and are discharged for other reasons:

$$\frac{\text{Number of children who does not reach discharge criteria after 12 weeks in treatment} \times 100}{\text{Total number of children who ended treatment}}$$

Average length of stay (ALOS) of SAM children cured discharges in outpatient care is expected to be below 60 days

$$\frac{\text{Sum of length of stay for all cured children in the outpatient care}}{\text{Total number of children who ended treatment cured}} \\ (<60 \text{ days}) (3, 14).$$

Average weight gain (AWG) is the daily weight gain that characterizes successful recovery in the programme. The AWG of cured children in outpatient care is expected to exceed 4 g/kg/day =

$$\frac{\text{Sum of the weight gains (g/kg/day) cured/treated SAM children in the Outpatient care}}{\text{number of cured/treated SAM children in the Outpatient care.}}$$

Referral rate/ Transfer-in rate is the transfer-in of children from another facility or stabilization care

$$= \frac{\text{Number of new referral}}{\text{Total number of new case}} \times 100$$

Relapse rate is the proportion of SAM children treated and discharged as "recovered" from a program and return to a state of severe malnutrition within 3-6 months post-discharge =

$$\frac{\text{re-occurrence of SAM within 3 to 6 months after discharged from the programme as recovered}}{\text{Total number discharged}}$$

Admission rate is the proportion of new cases of acute malnutrition admitted for treatment =

$$\frac{\text{New case admitted + transfer-in}}{\text{Total number on admission}}$$

Coverage (geographies) refers to the availability of services within a specific area =

$$\frac{\text{Number of CMAM centers in state}}{\text{Total number of LGAs in the state}}$$

### Statistical Analysis

Statistical analysis was performed using IBM-SPSS version 23. Descriptive statistics such as frequencies, percentages, mean, and standard deviation were used to describe the variables, and inferential statistics; the Chi-square test was employed to determine the relationship between variables. A statistically significant level was accepted at  $p < 0.05$ .

## RESULTS

### CMAM Programme Establishment, Coverage and Case Enrolment Across the Three States

Information on the establishment, coverage and enrolment of CMAM programmes across the States is presented in Table 1. The CMAM programme was established in Gombe State in the year 2009, with 27 active sites across the three senatorial zones (100.0%) and 64.0% coverage of the LGAs. The CMAM programme was established in 2020 in both Enugu and Ebonyi states, with 100.0% coverage each in the senatorial zones but lower LGA coverage of 18.0% and 23.0%, respectively. In Gombe State, a total of 92,314 SAM children aged 6-59 months were enrolled in the CMAM programmes between 2015 and 2023; of whom 31,519 (34.14%) were new cases, and 67 (0.07%) were transferred cases. Enugu and Ebonyi states enrolled 8,540 and 91,425 SAM children aged 6-59 months, with new cases constituting 8.7% (743) and 6.48% (5926), and transfer cases constituting 0.44% (38) and 0.06% (56), respectively. Female children accounted for most new cases in all three states, 51.05% in Gombe, 52.22% in Enugu, and 56.33% in Ebonyi State.

**Table 1: Establishment, Coverage, and SAM Caseload of CMAM Programme in the Three States**

| Variables                                                    | Gombe state |        | Enugu state |        | Ebonyi state |        |
|--------------------------------------------------------------|-------------|--------|-------------|--------|--------------|--------|
| Year of establishment of CMAM programme                      | 2009        |        | 2020        |        | 2020         |        |
| Number of CMAM programmes                                    | 27          |        | 3           |        | 3            |        |
| Number of stabilization centres                              | 7           |        | 1           |        | 1            |        |
|                                                              | Freq.       | %      | Freq.       | %      | Freq.        | %      |
| <b>Coverage of CMAM programme</b>                            |             |        |             |        |              |        |
| Senatorial zone                                              | 3           | 100.0  | 3           | 100.0  | 3            | 100.0  |
| Local Government Area                                        | 11          | 64.0   | 17          | 18.0   | 13           | 23.0   |
| <b>Malnourished children enrolled in the CMAM programmes</b> |             |        |             |        |              |        |
| Old case                                                     | 60,728      | 65.8%  | 7,759       | 90.9%  | 85,443       | 93.5%  |
| New case                                                     | 31,519      | 34.1%  | 743         | 8.7%   | 5,926        | 6.5%   |
| Transfer-in                                                  | 67          | 0.1%   | 38          | 0.4%   | 56           | 0.1%   |
| New admission Rate                                           | 31,586      | 34.2%  | 781         | 9.1%   | 5982         | 6.6%   |
| Total children enrolled                                      | 92,314      | 100.0% | 8,540       | 100.0% | 91,425       | 100.0% |
| <b>Sex of the new cases enrolled</b>                         |             |        |             |        |              |        |
| Male                                                         | 15428       | 49.0%  | 355         | 47.8%  | 2588         | 43.7%  |
| Female                                                       | 16091       | 51.1%  | 388         | 52.2%  | 3338         | 56.3%  |
| Total                                                        | 31519       | 100.0% | 743         | 100.0% | 5926         | 100.0% |

Note: "no records of relapse" in the study is a limitation, showing that records of relapse cases were not tracked due to weak follow-up and implementation of the programme.

### Enrolment Criteria and Treatment Outcome Across the Three States

The enrolment criteria and treatment outcome across the three states are presented in Table 2. The use of Mid Upper Arm Circumference (MUAC) screening was the predominant enrolment criterion into CMAM programmes across all three states.

The overall use of MUAC was 96.9%, with 93.6% in Gombe and 100.0% in Enugu and Ebonyi states. 100.0% used MUAC screening for enrolment criteria. Table 2 also presents the treatment outcomes at exit. Ebonyi State had the highest cure rate (91.0%), followed by Gombe (86.8%), while Enugu State had the lowest cure rate (67.9%). Death rates

were 1.0% in Gombe and 0.5% in Ebonyi, while Enugu State had no recorded deaths. The defaulter rate was 30.4% in Enugu, 10.2% in Gombe, and

8.4% in Ebonyi State. Non-recovery rates were 2.1%, 1.8%, and 0.1% in Gombe, Enugu, and Ebonyi State, respectively.

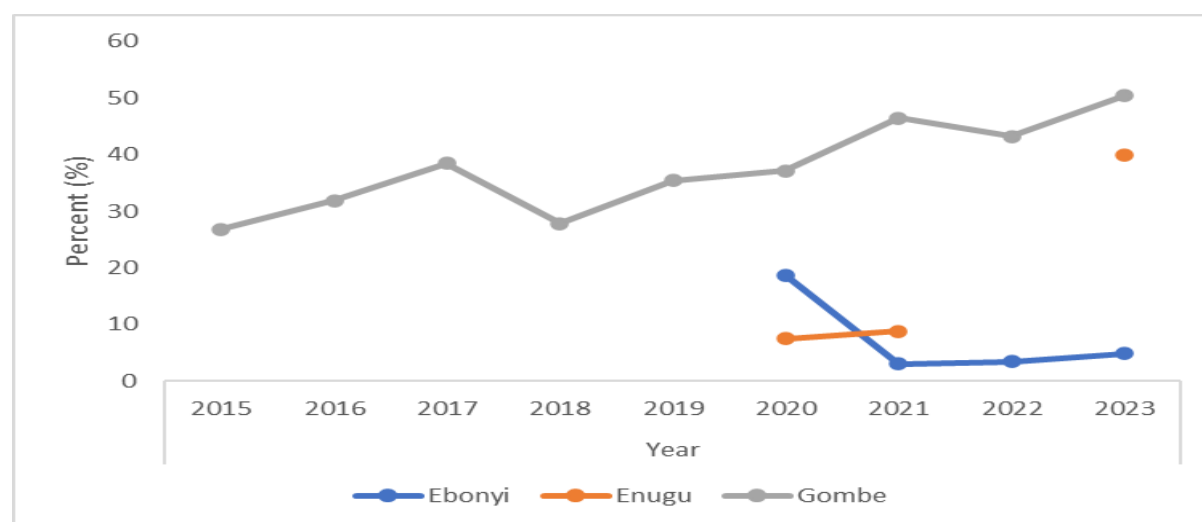
**Table 2: Enrolment Criteria and Treatment Outcomes in CMAM Programme Across Gombe, Enugu, and Ebonyi States**

| Variables                                  | Gombe state |        | Enugu state |        | Ebonyi state |        |
|--------------------------------------------|-------------|--------|-------------|--------|--------------|--------|
|                                            | Frequency   | %      | Frequency   | %      | Frequency    | %      |
| <b>Enrollment screening criteria</b>       |             |        |             |        |              |        |
| Oedema                                     | 1385        | 1.5%   | 0           | 0.0%   | 0            | 0.0%   |
| Mid Upper Arm Circumference <11.5cm        | 86406       | 93.6%  | 8540        | 100.0% | 91,425       | 100.0% |
| Weight for Height <-3ZScore                | 4523        | 4.9%   | 0           | 0.0%   | 0            | 0.0%   |
| <b>Treatment outcomes</b>                  |             |        |             |        |              |        |
| Cured                                      | 23163       | 86.8%  | 152         | 67.9%  | 2036         | 91.0%  |
| Deaths                                     | 260         | 1.0%   | 0           | 0.0%   | 12           | 0.5%   |
| Defaulters                                 | 2708        | 10.2%  | 68          | 30.4%  | 187          | 8.4%   |
| Non-recovered                              | 548         | 2.1%   | 4           | 1.8%   | 3            | 0.1%   |
| Total (Discharged)                         | 26679       | 100.0% | 224         | 100.0% | 2238         | 100.0% |
| <b>Classification of changes in weight</b> |             |        |             |        |              |        |
| Low weight gain (< 5 g/kg/day)             | 311         | 48.7%  | 75          | 75.0%  | 50           | 63.3%  |
| Moderate weight gain (5–10 g/kg/day)       | 200         | 31.3%  | 13          | 13.0%  | 18           | 22.8%  |
| Good weight gain (>10 g/kg/day)            | 127         | 19.9%  | 12          | 12.0%  | 11           | 13.9%  |

### Percentage Distribution of New Cases of SAM Children in CMAM Centers Across the Three States between 2015 And 2023

Figure 1 shows the trends in new SAM case enrolment. New cases represented 34.1% of total enrolments in Gombe, peaking at 50.4% in 2023 and

at their lowest (26.8%) in 2015. In Enugu, new cases constituted 8.7% of total enrolments, with no new cases recorded in 2022 but a peak of 40.0% in 2023. Ebonyi recorded 6.5% new cases overall, with the highest proportion in 2020 (18.7%) and the lowest in 2021 (3.0%).



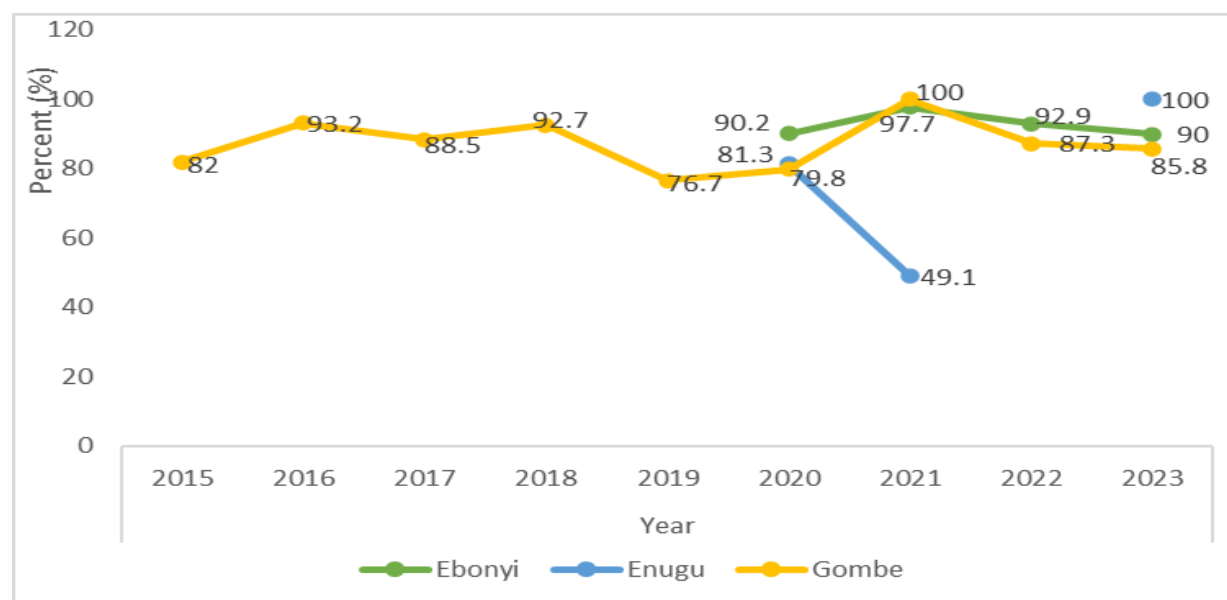
**Figure 1: Percentage Distribution of New Cases of SAM Children in CMAM Centers Across the Three States between 2015 And 2023**

Note: In 2022, Enugu State has missing values for new cases of SAM children; the CMAM programme in Ebonyi and Enugu State started in 2020, and the results show (2020-2023)

### Percentage Cure Rate of SAM Children Treated in the CMAM Programme in Gombe, Enugu and Ebonyi States between 2015 And 2023

Cure rates fluctuated across all three states over the study period is presented in Figure 2. In Gombe, the rate ranged from a low of 76.7% in

2019 to 100.0% in 2021, with an overall increase from 82.0% in 2015 to 85.8% in 2023. Enugu's cure rate improved from 81.3% in 2020 to 100.0% in 2023, though it declined as low as 49.1% in 2021. Ebonyi recorded its highest cure rate of 97.7% in 2021, declining to 90.0% by 2023.



**Figure 2: Percentage Cure Rate of SAM Children Treated in CMAM Programme in Gombe, Enugu and Ebonyi States between 2015 And 2023.**

Note: In 2022, Enugu State has missing values for cured SAM children. The CMAM programme in Ebonyi and Enugu States started in 2020, and the results show (2020-2023)

### Annual Death and Non-Recovery Rates of SAM Children in the CMAM Programme between 2015 and 2023 in Gombe, Enugu and Ebonyi States

The study observed annual fluctuations in the death rate of SAM children (Figure 3). In Gombe State, the death rate increased from 1.1% in 2015 to 2.5% in 2023. In Ebonyi, it increased from 0.3% in 2020 to 2.3% in 2023, while Enugu had no deaths recorded. The non-recovery rate by state and year is also presented in Figure 3.

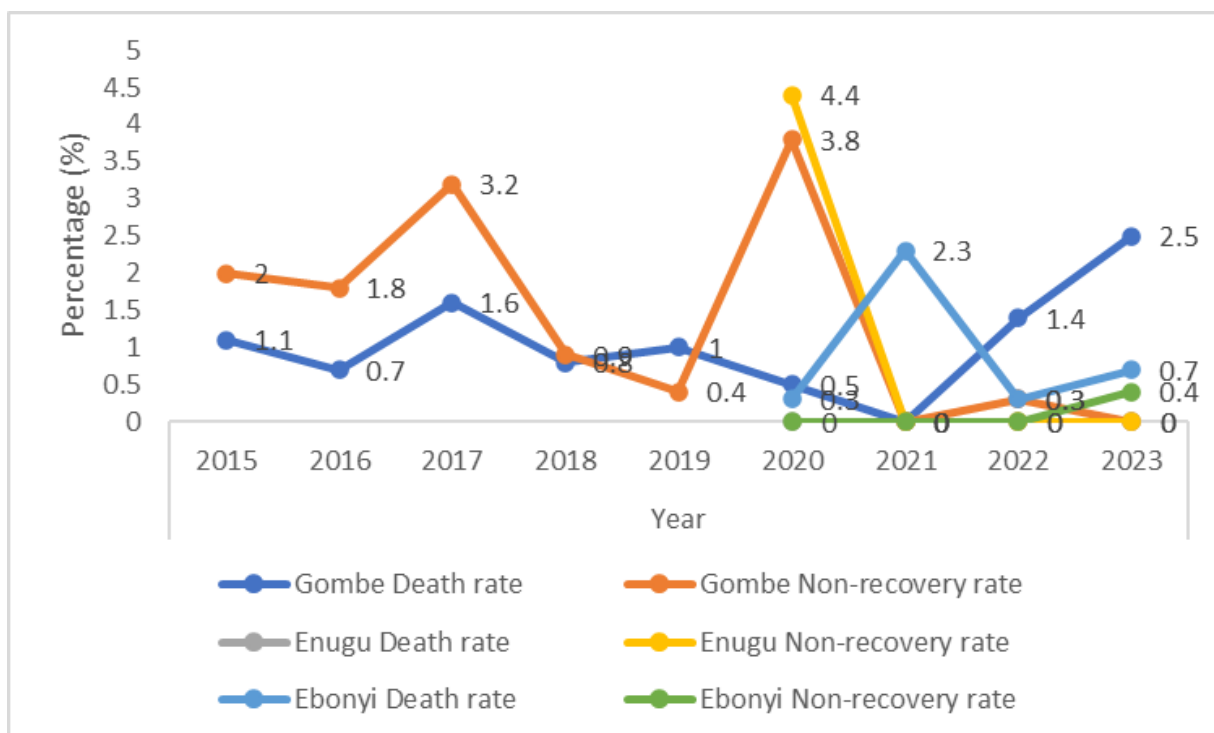
### Annual Default Rates of SAM Children in the CMAM Programme Across the Three States in Nigeria between 2015 And 2023

Enugu recorded the highest single-year non-recovery rate of 4.4% in 2020. Gombe's rates fluctuated

between 1.8% and 3.8% across various years, while Ebonyi's rose from 0.0% in 2020 to 0.4% in 2023. highest default rate was 50.9% in 2021 in Enugu State, followed by 21.9% in 2019 in Gombe State (Figure 4).

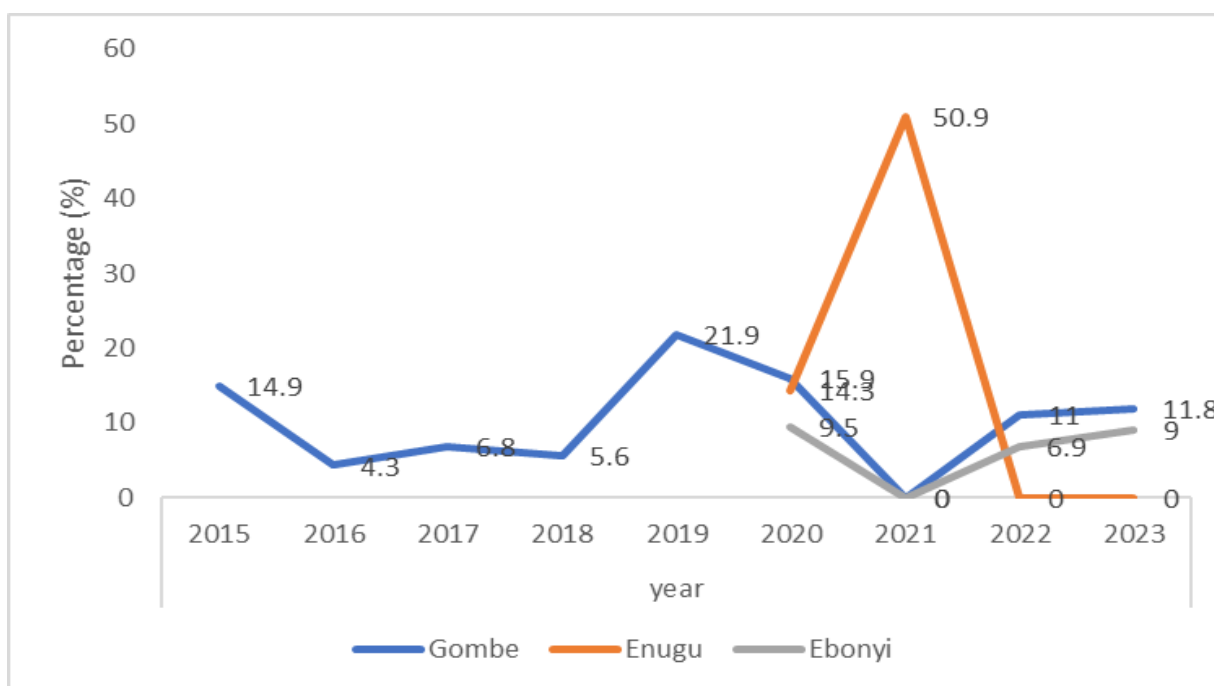
### Average Number of Days SAM Children Spent in the CMAM Programme in Gombe, Enugu, and Ebonyi States between 2015 And 2023

The average length of stay varied by state (Figure 5). Ebonyi had the longest average of 84 days (83 days in 2020; 85 days in 2023), while Gombe and Enugu averaged 34 and 29 days. More three quarter (75.0%) of treated SAM children in Enugu's CMAM programme, Ebonyi (63.3%), and Gombe (48.7%) had low weight gain of < 5 g/kg/day.

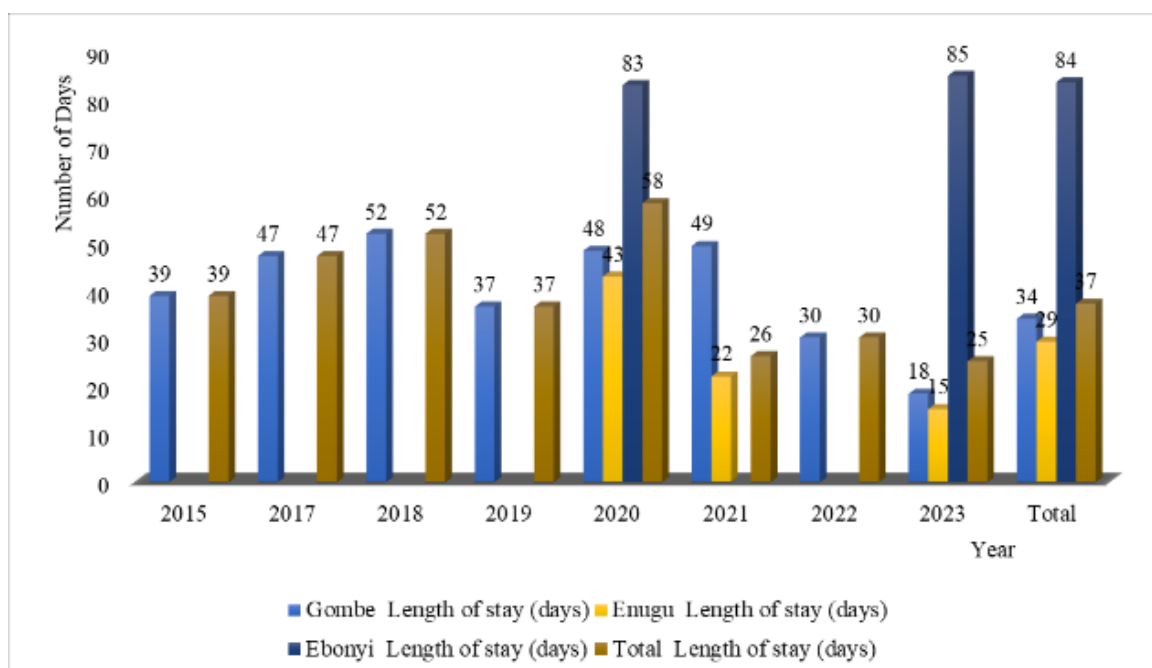


**Figure 3: Annual Death and Non-Recovery Rates of SAM Children in the CMAM Programme between 2015 and 2023 in Gombe, Enugu and Ebonyi States.**

*Note: The CMAM programme in Ebonyi and Enugu States started in 2020, and the results show (2020-2023)*



**Figure 4: Annual Default Rates of SAM Children in CMAM Programme Across the Three States in Nigeria between 2015 And 2023.**



**Figure 5: Average Number of Days SAM Children Spent in the CMAM Programme in Gombe, Enugu, and Ebonyi States between 2015 And 2023.**

## DISCUSSION

This study evaluated CMAM performance indicators across Gombe, Enugu, and Ebonyi States in Nigeria between 2015 and 2023. The study observed poor coverage of CMAM services across the states relative to the high burden of severe acute malnutrition. These findings are consistent with reports that CMAM services in Nigeria reach only 15-37% of the national SAM caseload. This low coverage of CMAM services contributes to high under-five mortality in Nigeria. Evidence has shown that SAM children are 5-20 times more likely to die than healthy children; thus, untreated severe acute malnutrition (SAM) increases death risk significantly, with mortality rates estimated up to 21% annually (18). Low coverage restricts early detection, limits access to RUTF, and forces families to rely on expensive hospital-based care (18). The markedly lower coverage in Enugu and Ebonyi is partly explained by the later establishment of programmes in those states (2020), compared to Gombe (2009), and reflects the broader pattern of CMAM scale-up being concentrated in northern Nigeria where malnutrition rates are highest (7, 8). Strengthening geographic coverage, particularly at LGA level in the south-east, is essential to reducing untreated SAM and its associated mortality risk (18).

Female children accounted for a higher proportion of new SAM cases in all three states. This pattern is consistent with evidence from sub-Saharan Africa showing that girls are disproportionately affected by SAM, attributed to gender-based disparities in

feeding practices, care-seeking behaviour, and cultural norms that prioritise male children in resource-constrained households (19). This finding is further supported by studies demonstrating that female children are more frequently diagnosed with SAM, in part due to a higher prevalence of comorbidities such as HIV and tuberculosis among girls [20]. These findings underscore the importance of gender-sensitive approaches in community screening and CMAM programme design in Nigeria.

Screening of MUAC was the predominant enrolment criterion across all three states. This is consistent with Nigeria's national CMAM guidelines, which designate MUAC less than 11.5 cm as the primary admission criterion for children aged 6–59 months (3). The wide adoption of MUAC reflects its practicality as it requires minimal equipment, can be administered by community health workers, and has proven cost-effective for SAM detection in resource-limited settings. The small proportion of centres using weight-for-height z-score (WHZ) or oedema as additional criteria likely reflects the availability of weighing equipment and the clinical presentation of complicated cases requiring referral (4).

Gombe and Ebonyi states achieved cure rates of 86.82% and 90.97%, respectively, both exceeding the Sphere minimum standard of 75% for CMAM programmes (3). These rates confirm the effectiveness of RUTF-based outpatient therapeutic care when protocols are adequately followed, and commodities are available. By contrast, Enugu State

recorded a low overall cure rate of 67.86%, falling below international standards. This may reflect the relatively recent establishment of the programme in Enugu, limited health worker capacity, and data quality issues. Cure rates also varied by year across all three states, particularly in Enugu, where the rate fell to 49.1% in 2021. This suggests that programme performance is sensitive to commodity availability, staffing, and external shocks such as the COVID-19 pandemic. Comparable retrospective studies in Ethiopia reported recovery rates of 79-95% for uncomplicated SAM cases, with overall cure rates of approximately 92% (10, 21), indicating that the performance observed in Gombe and Ebonyi is achievable but that significant gaps remain, particularly in Enugu.

Death rates in Gombe and Ebonyi were within the Sphere standard of less than 10% of programme exits (3), and no deaths were recorded in Enugu. It should be noted that poor data management, stock-outs of essential commodities, and periods of service inactivity across the study period likely resulted in underreporting of deaths, particularly among children who defaulted and subsequently died at home without being recorded in programme registers (1, 2). The true mortality burden is therefore expected to be higher than reported, consistent with observations that Nigerian CMAM data systems frequently provide a misleadingly favourable impression of programme performance (1).

Default rates were a major performance concern in this study. Gombe exceeded the international threshold of less than 15% in 2019 (21.9%) and 2020, while Enugu recorded a high default rate of 50.9% in 2021, which is twice higher than the Sphere threshold of 25% that triggers urgent programme review (3). A defaulter, defined as a child absent for three consecutive weeks from OTP without official discharge, represents a potential death, as SAM children who do not complete treatment remain at high mortality risk. The drivers of high default rates in this study may include long distances to treatment centres, RUTF stock-outs, poor community awareness, and insecurity (3, 8). Sustained investment in community mobilization, decentralization of service delivery points, and consistent commodity supply chains is critical to reducing default rates to acceptable levels.

Non-recovery rates also exceeded the Sphere benchmark of zero across all three states, with Gombe recording rates as high as 3.8% in some years and Enugu recording 4.4% in 2020. Non-recovery is defined as failure to achieve discharge

criteria after a defined treatment period. This suggests sub-optimal care quality and may reflect protocol non-adherence, inadequate RUTF dosing, unmanaged comorbidity, or persistent household food insecurity that undermines treatment gains (3). The study observed low weight gain among the SAM children treated across the three states. The findings are lower than the average weight gain reported in the study by Isanaka et al. (22) of 9.8g/kg/d in the first week of admission and 4.2 g/kg/d at week 4. Low weight gain is an indication of poor treatment outcome; it reflects issues with RUTF given to the child, as it could be misused, diverted, or shared by family members. It requires re-assessment of the child to uncover the underlying problem of low weight gain, poor appetite, infections, and quality of RUTF treatment. This calls for an urgent need for overhauling the programmes, re-assessment of the children, and robust monitoring and supervision of the programme.

The absence of relapse data in this study is a limitation; post-discharge follow-up was not systematically conducted, meaning that children who recovered and subsequently relapsed would not have been captured in programme records. The average length of stay varied across states. Ebonyi's 84-day stay is at the upper limit of the recommended 6–12 weeks, while Gombe and Enugu stays were within the acceptable range (3). The shorter stay in Enugu may reflect early discharge, incomplete treatment, or a higher proportion of defaulters being excluded from length-of-stay calculations. Conversely, Ebonyi's longer average stay may indicate more severe presentations at admission or slower weight gain, and requires further investigation.

The findings indicate poor overall CMAM programme performance across the three states during the study period, characterized by inadequate coverage, high default rates in Enugu and Gombe, substandard cure rates in Enugu, and data quality limitations that likely underestimate the true burden of mortality and non-recovery. These performance gaps are consistent with the broader challenges documented for the Nigerian CMAM programme, including over-reliance on international funding, limited local RUTF supply, weak supervision systems, and insufficient integration with preventive nutrition services (1, 2, 8). The findings highlight the urgent need for sustained domestic investment, robust programme monitoring, and strengthened community engagement to improve CMAM performance across all regions of Nigeria.

## CONCLUSION

The study observed poor performance of the CMAM programme across Gombe, Enugu and Ebonyi States between 2015 and 2023. Enugu State recorded the most critical gaps, including an unacceptable low cure rate, low geographical coverage of the programme, high default rate, and low weight gain of SAM children on treatment.

## RECOMMENDATIONS

Hence, there is a need to strengthen the CMAM services through adequate funding, sustainable supply of commodities, especially RUTF, encouraging local production of RUTF, regular training and capacity-building of health workers, effective supervision, monitoring and research on the CMAM programme in Nigeria.

## CONFLICT OF INTERESTS

The authors declared that they have no conflicts of interest.

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