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A Comparative Analysis of Nutritional Perspectives Among Under-Fives in Akwa Ibom and Bayelsa States in 2022: A Case Study of Randomly Selected Areas

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Abstract: *This study compared the nutritional perspectives of the Under-fives in selected locations in Akwa Ibom and Bayelsa States. Based on the results and finding in this survey, it was revealed that the prevalence of Global Acute Malnutrition (GAM) as per Mid-Upper-m Circumference (MUAC) among children 6-59 months in Akwa Ibom State indicated 15.8% (9.8-24.6 95% CI) and that of SAM is 7.6% (3.3-16.5 95% CI), which are at critical stages at the time of the survey, based on the Integrated Food Security Phase Classification (IPC) and World Health Organization (WHO) classification. The study also revealed that the prevalence rate for Global Acute Malnutrition (GAM) among girls was 19.1% (12.2 - 28.8 95% C.I.), higher than that for boys, 11.8% (5.9 - 22.2 95% C.I.). This was also applicable to Severe Acute Malnutrition (SAM) cases as determined by MUAC. Similarly, the prevalence of Global Acute Malnutrition (GAM) as per MUAC among children 6-59 months in Bayelsa State indicated a 20.6% (13.9 - 29.4 95% C.I.), and that of Severe Acute Malnutrition (SAM) indicated a 7.9 % (4.1 - 14.8 95% C.I.), which were at critical stages at the time of the study, based on the IPC and WHO classification. The prevalence rate for GAM among girls in Bayelsa State was 22.6% (14.3 - 33.7 95% C.I.), which was higher than that for boys: 18.4% (11.6 - 28.0 95% C.I.). This is also applicable in the SAM cases based on MUAC.*

Keyword: *Under-fives (U5), Severe Acute Malnutrition (SAM), Global Acute Malnutrition (GAM), Mid-Upper-Arm Circumference (MUAC), Integrated Food Security Phase Classification (IPC), World Health Organization (WHO), Edema.*

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1.0 Introduction

Childhood malnutrition remains one of the most serious public health challenges globally, particularly among children under five years of age. It adversely affects physical growth, cognitive development, immune function, educational attainment, and future economic productivity. Malnutrition also weakens children's resistance to infectious diseases such as diarrhoea, pneumonia, and malaria, thereby increasing the risk of morbidity and mortality. According to the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), undernutrition remains an underlying cause of approximately 45% of deaths among children under five years of age, with the greatest burden occurring in low- and middle-income countries. Despite sustained global efforts to improve child nutrition, severe acute malnutrition (SAM) continues to affect millions of children worldwide, making it a major public health concern.

Sub-Saharan Africa bears a disproportionate share of the global burden of childhood malnutrition owing to persistent poverty, food insecurity, inadequate dietary diversity, poor maternal nutrition, limited access to healthcare services, recurrent infectious diseases, and inadequate water, sanitation, and hygiene (WASH) facilities. Nigeria contributes substantially to this burden and remains among the countries with the highest number of malnourished children globally. The Nigeria Demographic and Health Survey (NDHS)

reported that approximately 37% of children under five years of age are stunted, with considerably higher prevalence in rural (46%) than urban (27%) communities. These statistics underscore the continued need for targeted nutritional interventions and regular surveillance to identify vulnerable populations and monitor progress towards national and global nutrition targets.

Several studies have demonstrated that childhood malnutrition is influenced by a complex interaction of socioeconomic, environmental, demographic, and health-related factors. Household poverty, maternal educational attainment, inappropriate infant and young child feeding practices, inadequate dietary intake, poor environmental sanitation, food insecurity, and recurrent childhood illnesses have all been identified as significant determinants of acute malnutrition. Nutritional surveillance using standardized anthropometric indicators, particularly the Mid-Upper Arm Circumference (MUAC), has become an important public health tool for identifying children at risk of severe acute malnutrition and for monitoring nutritional emergencies. Furthermore, the Integrated Food Security Phase Classification (IPC) and WHO nutritional classification systems provide internationally accepted criteria for assessing the severity of acute malnutrition and guiding emergency nutrition interventions.

The Niger Delta region presents unique socioeconomic and environmental conditions that may influence childhood nutritional outcomes. Although the region contributes substantially to Nigeria's petroleum economy, many communities continue to experience widespread poverty, inadequate healthcare services, environmental pollution arising from oil exploration activities, and limited access to safe water and sanitation. These conditions, coupled with periodic flooding and livelihood disruptions, may adversely affect household food security and child nutrition. Consequently, children residing in the region remain vulnerable to acute malnutrition despite the economic importance of the area.

Akwa Ibom and Bayelsa States are neighbouring oil-producing states within the Niger Delta region that share several environmental and socioeconomic characteristics while exhibiting differences in population distribution, accessibility, livelihood patterns, and healthcare delivery. Akwa Ibom comprises both coastal and upland communities, where fishing, farming, trading, and civil service constitute the principal occupations. Bayelsa State is predominantly riverine, with dispersed settlements that are often difficult to access because of extensive waterways. Although both states derive considerable economic benefits from petroleum resources, many communities continue to experience poverty, environmental degradation, and infrastructural challenges that may influence child nutritional status. These contrasting characteristics provide an appropriate basis for comparative nutritional assessment.

Although national nutrition surveys have provided valuable information on the prevalence of childhood malnutrition in Nigeria, they often report state-level estimates without detailed comparative analyses of neighbouring states sharing similar ecological and socioeconomic characteristics. Furthermore, few studies have specifically compared the prevalence of Global Acute Malnutrition (GAM) and Severe Acute Malnutrition (SAM) among children aged 6–59 months in Akwa Ibom and Bayelsa States using standardized MUAC measurements and WHO/IPC classification criteria. The limited availability of such comparative evidence represents an important knowledge gap, particularly for nutrition programme planning and resource allocation within the Niger Delta region.

Therefore, this study aimed to compare the nutritional status of children aged 6–59 months in randomly selected communities in Akwa Ibom and Bayelsa States using Mid-Upper Arm Circumference (MUAC) measurements. Specifically, the study assessed the prevalence of Global Acute Malnutrition (GAM), Severe Acute Malnutrition (SAM), and bilateral pitting oedema among under-five children, and examined differences according to sex and geographical location based on the WHO and Integrated Food Security Phase Classification (IPC) criteria.

The findings of this study provide important evidence for policymakers, public health practitioners, nutrition programme managers, and humanitarian organizations involved in child nutrition and food security programmes. The results will support the design of targeted nutrition interventions, strengthen nutritional surveillance systems, facilitate evidence-based allocation of resources, and contribute to reducing childhood malnutrition in vulnerable communities of the Niger Delta. Furthermore, the study contributes to the growing body of knowledge on regional disparities in childhood nutritional status and supports Nigeria's efforts toward achieving Sustainable Development Goal 2 (Zero Hunger), Sustainable Development Goal 3 (Good Health and Well-being), and the World Health Assembly Global Nutrition Targets.

2.0 Materials and Methods

This study employs a cross-sectional survey procedure using a two-stage cluster sampling technique based on Probability Proportional to Size (PPS), which is useful in Nutrition KAP surveys (UNICEF Malawi, 2021). This allowed for greater representation from villages/wards with larger population sizes. The number of inclusions in the survey was kept to an absolute minimum to maximize interview time. The sample sizes were at the necessary minimum to ensure acceptable precision in accordance with the Knowledge, Attitude and Practice (KAP) survey guidelines. The survey used the usual methods for measuring MUAC and gathering information on most nutritional needs during the assessment. Well-trained enumerators sufficiently assessed the children's ages before entry. All enumerators and supervisors were <60 years of age, which avoided the risk of COVID-19 complications. The survey targeted 12 selected local governments in Akwa Ibom and Bayelsa States, with seemingly heterogeneous characteristics as shown by the projected estimated population sizes below, which are sourced from the website of the National Population Commission (NPC) and the National Bureau of Statistics (NBS) 2016 projections, bearing in mind the lack of current population knowledge of the areas. However, these statistics were used strictly to facilitate cluster selection during the survey's planning stage. In this survey, we considered a household to comprise a group of people (a man, one wife, even if he has more than two wives, her children, and any of the husband's relatives) living under the same roof and sharing food from the same pot (WFP May, 2019 Nigeria Country Brief).

2.1 Sample Size Calculation

2.1 Sample Size Determination

The sample size for the Knowledge, Attitudes, and Practices (KAP) survey was determined using the finite population correction formula for cross-sectional studies. The calculation assumed a 95% confidence level ($Z = 1.96$), a margin of error of 5% ($d = 0.05$), and a response distribution (prevalence) of 50% ($p = 0.50$), which provides the maximum sample size when the true prevalence is unknown. Household population estimates of 345,800 for Akwa Ibom State and 323,399 for Bayelsa State were obtained from the National Population Commission (NPC) and National Bureau of Statistics (NBS) population projections, with average household sizes of 4.0 and 3.5 persons, respectively (NNHS,

2018). The required minimum sample size was estimated using the Raosoft Sample Size Calculator and yielded 384 households for each state.

The sample size was calculated using the finite population correction formula:

$$n = \left[\frac{Np}{((N-1)e^2 + p)} \right] \quad (1)$$

where;

$$p = \left[Z(\frac{c}{100})^2 \right] r(100 - r) \quad (2)$$

n = required sample size, expressed as number of households, N = is Household population size, r = is the fractional response of interest, $\left[Z(\frac{c}{100}) \right]$ = Critical value for the confidence level and e = error margin

A minimum of 384 households with at least one eligible child aged 0–59 months was therefore selected in each state. This sample size provided sufficient statistical precision to estimate the prevalence of acute malnutrition and related nutritional indicators among under-five children in the study population.

2.2 Study area and population

This study employed a community-based cross-sectional survey conducted among households with children aged 0–59 months in selected Local Government Areas (LGAs) of Akwa Ibom and Bayelsa States, located in the South-South geopolitical zone of Nigeria. Both states are situated within the Niger Delta region and share similar environmental and socioeconomic characteristics, including dependence on fishing, farming, trading, and petroleum-related activities, although they differ in settlement patterns, accessibility, and population distribution.

The study population comprised all households with eligible children aged 0–59 months residing in the selected LGAs during the survey period. Eight LGAs were selected in Akwa Ibom State (Ibeno, Ikot Ekpene, Mbo, Okobo, Oron, Udung Uko, Uruan, and Uyo), while four LGAs (Nembe, Ogbia, Brass, and Yenagoa) were selected in Bayelsa State based on the survey sampling frame.

A two-stage cluster sampling technique was adopted following the Standardized Monitoring and Assessment of Relief and Transitions (SMART) survey methodology. In the first stage, 30 clusters (political wards) were selected independently in each state using probability proportional to size (PPS) sampling based on the ENA for SMART (2020) sampling platform. The selected wards served as the Primary Sampling Units (PSUs), while households constituted the Secondary Sampling Units (SSUs). Reserve clusters were identified during the sampling process and were only surveyed when originally selected clusters were inaccessible because of logistical or security constraints.

In the second stage, eligible households within each selected cluster were identified using the SMART-recommended household selection procedure. The starting household was determined using the Expanded Programme on Immunization (EPI) method, after which households were selected systematically until the required number of eligible households was achieved. Approximately 13 households were surveyed in each cluster, resulting in a total sample of 384 households per state distributed across 30 clusters.

The estimated household and population distributions for the selected Local Government Areas in Akwa Ibom and Bayelsa States are presented in Tables 1 and 2, respectively.

2.3 Study design, cluster Selection and sampling procedure

A community-based cross-sectional survey was conducted using the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology to assess the nutritional status of children aged 0–59 months in selected communities of Akwa Ibom

and Bayelsa States. The survey was implemented using the Emergency Nutrition Assessment (ENA) for SMART software (Version 2020), which was employed for survey planning, cluster selection, data quality monitoring, and nutritional analysis.

Table 1: Estimated Population for Akwa Ibom Survey Population

LGAs	Household Size* (4.0 NNHS,2018)	Population Size
Ibeno	26,275	105,100
Ikot Ekpene	49,675	198,700
Mbo	35,875	143,500
Okobo	36,100	144,400
Oron	30,625	122,500
Udung Uko	18,625	74,500
Uruan	41,150	164,600
Uyo	107,475	429,900
Total	345,800	1,385,200

Source: NPC, NBS Population Projection (2016) and NNHS (2018)

Table 2: Estimated Population for Bayelsa Survey Population

LGAs	Household Size* (3.5 NNHS,2018)	Population Size
Nembe	50,000	175,000
Ogbia	68,571	240,000
Brass	70,314	246,100
Yenagoa	134,514	470,800
Total	323,399	1,131,900

Source: NPC, NBS Population Projection (2016) and NNHS (2018)

Field data collection was undertaken by trained survey teams comprising enumerators and supervisors assigned to the selected Local Government Areas (LGAs). Each survey team visited approximately 12–13 eligible households within each selected cluster to achieve the predetermined sample size of 384 households per state. Data collection was completed over 2–4 days in each LGA, depending on the number of clusters, accessibility of the communities, and prevailing field conditions.

Prior to data collection, the survey teams established contact with community leaders and local health authorities to introduce the study, obtain community cooperation, and identify the boundaries of the selected clusters. Within each selected cluster, households were visited sequentially following the SMART household selection protocol until the required number of eligible households was attained. In households with more than one eligible child aged 0–59 months, all eligible children were assessed for nutritional status in accordance with the SMART survey guidelines.

To ensure consistency in field implementation, standardized survey procedures were followed throughout the study. Survey supervisors conducted regular field monitoring to verify adherence to sampling procedures, confirm the accuracy of anthropometric measurements, and resolve any operational challenges encountered during data collection. Where selected clusters were inaccessible because of security concerns, difficult terrain, flooding, or other unforeseen circumstances, pre-selected reserve clusters were surveyed in accordance with the SMART replacement protocol.

All survey activities were implemented in accordance with the Standardized Monitoring and Assessment of Relief and Transitions (SMART) Guidelines and the World Health Organization (WHO) recommendations for community-based nutritional assessments. The survey methodology ensured that every eligible household within the selected clusters had an equal probability of selection, thereby enhancing the representativeness and reliability of the survey findings. Based on the required sample size of 384 households and an average of 13 eligible households surveyed per cluster,

approximately 30 clusters were required (384 ÷ 13 = 29.5), which was rounded up to 30 clusters in accordance with the SMART survey methodology. Consequently, all 384 households were successfully surveyed in each state, providing an adequate sample for estimating the prevalence of acute malnutrition and other nutritional indicators among children aged 0–59 months.

Each household interview, including anthropometric measurements and administration of the Knowledge, Attitudes, and Practices (KAP) questionnaire, required approximately 30 minutes to complete, although the duration varied depending on household size and respondent availability. Survey supervisors conducted routine field monitoring and daily reviews of completed questionnaires to ensure strict adherence to the study protocol, verify the completeness and consistency of data collected, and promptly address any operational challenges encountered during fieldwork. These quality control measures contributed to the successful completion of data collection and enhanced the reliability and validity of the survey findings.

Table 3: Time table for Household Selection Per day

Total Time for Entire Work/ Level of Effort (LOE)	**8:00AM - 5:00PM (9hrs: 00mins) = 540mins**	**Time Difference**
Morning debriefing	10 minutes.	540-10 = 530 minutes
Transportation time to Cluster (Round)	25 minutes.	530-25 = 505 minutes
Final preparation of HH listing	25 minutes.	505-25 = 480 minutes
Break time	20 minutes.	480-20 = 460 minutes
Average time taken for Household interview	30 minutes	
Movement time from one eligible HH to another/sanitizing oneself the survey instruments.	5 minutes	
Average HH to be visited per cluster by one team per day	(460/35) = 13HHs	

2.4 Training and Supervision

Data collection was conducted by trained enumerators and field supervisors who had prior experience in community-based nutrition surveys. The survey teams participated in a one-day refresher training based on the Standardized Monitoring and Assessment of Relief and Transitions (SMART) Interim Guidelines (2020). The training covered the objectives of the survey, sampling procedures, age estimation techniques, standardized Mid-Upper Arm Circumference (MUAC) measurement, assessment of bilateral pitting oedema, administration of the Knowledge, Attitudes, and Practices (KAP) questionnaire, ethical considerations, electronic data capture using the KoboCollect platform, and measures to minimize interviewer and measurement bias.

At the end of the training, all participants completed practical standardization exercises, role-play sessions, and field pre-tests to assess their competency in anthropometric measurements and questionnaire administration. Enumerator performance was evaluated based on measurement accuracy, interview skills, and adherence to survey protocols before deployment to the field.

Where cultural or gender-related considerations arose during caregiver interviews or anthropometric assessments, female enumerators were assigned to ensure respondent comfort and data quality. Throughout the survey, field supervisors provided technical oversight, monitored adherence to the sampling protocol, verified anthropometric measurements, reviewed completed questionnaires daily, and addressed operational challenges encountered during data collection.

2.5 Data Collection

Data were collected from eligible households using standardized nutrition and Knowledge, Attitudes, and Practices (KAP) questionnaires developed in accordance with the SMART methodology. The questionnaires were programmed into the Open Data Kit (ODK) KoboCollect platform and administered electronically using Android-based tablet devices. Electronic data capture minimized transcription errors and enabled real-time monitoring of data completeness and consistency.

Information collected included the child's age, sex, Mid-Upper Arm Circumference (MUAC), presence of bilateral pitting oedema, and other relevant nutritional and household characteristics. The age of each child was determined primarily from birth certificates, immunization cards, or other official documents where available. Where documentary evidence was unavailable, age was estimated using caregiver recall supported by local event calendars.

Mid-Upper Arm Circumference was measured on the left upper arm at the midpoint between the acromion and olecranon processes using a standard WHO-recommended MUAC tape. Measurements were recorded to the nearest millimetre following standard anthropometric procedures. Bilateral pitting oedema was assessed by applying gentle thumb pressure to the dorsum of both feet for approximately five seconds. Oedema was considered present when a persistent indentation remained after the pressure was released.

Children with a MUAC of less than 115 mm and/or bilateral pitting oedema were classified as having Severe Acute Malnutrition (SAM), while those with MUAC values between 115 mm and less than 125 mm were classified as having Moderate Acute Malnutrition (MAM), in accordance with the WHO 2006 Child Growth Standards and SMART guidelines. Any suspected case of severe acute malnutrition was independently verified by at least two trained team members and a field supervisor before referral to the nearest health facility for appropriate management.

The survey was conducted in accordance with the COVID-19 infection prevention and control measures recommended by the SMART Guidelines. Enumerators practised regular hand hygiene, maintained appropriate physical distancing during interviews where feasible, and used personal protective equipment as required throughout the survey period.

2.6 Data Quality Assurance

Comprehensive quality assurance measures were implemented throughout the survey to ensure the accuracy, completeness, and reliability of the data collected. All enumerators received standardized training and practical field exercises before data collection commenced. Anthropometric equipment was calibrated daily before use and checked periodically throughout the survey to maintain measurement accuracy.

Field supervisors conducted continuous monitoring of data collection activities, including direct observation of interviews, repeat anthropometric measurements where necessary, verification of household selection procedures, and daily review of completed electronic questionnaires. Automated validation rules incorporated into the

KoboCollect platform minimized data entry errors by restricting invalid responses and identifying incomplete records in real time.

At the end of each day, completed datasets were reviewed jointly by the survey coordinators and field supervisors to identify inconsistencies, missing values, and potential outliers requiring verification. Age estimates were cross-checked using available documentary evidence, while anthropometric measurements that appeared biologically implausible were re-examined in accordance with SMART quality control procedures. These quality assurance measures enhanced the accuracy, consistency, and overall reliability of the survey data.

2.7 Data Processing and Statistical Analysis

Completed datasets were exported from the KoboCollect platform, cleaned, validated, and analysed using Emergency Nutrition Assessment (ENA) for SMART software (Version 2020), Microsoft Excel, and IBM SPSS Statistics (Version 25.0). Data cleaning included verification of variable coding, identification of duplicate records, assessment of missing values, and exclusion of biologically implausible anthropometric measurements based on the WHO 2006 Child Growth Standards and SMART plausibility criteria. A complete audit trail was maintained to document all data cleaning and validation procedures.

Descriptive statistics were used to summarize the characteristics of the study population. Continuous variables were expressed as means and standard deviations, while categorical variables were summarized using frequencies, percentages, and 95% confidence intervals. The prevalence of Global Acute Malnutrition (GAM), Moderate Acute Malnutrition (MAM), Severe Acute Malnutrition (SAM), and bilateral pitting oedema was estimated using MUAC classification according to the WHO 2006 Child Growth Standards and the Integrated Food Security Phase Classification (IPC) thresholds.

Comparisons between Akwa Ibom and Bayelsa States, as well as between male and female children, were performed using Pearson's chi-square test or Fisher's exact test where appropriate. Statistical significance was established at a two-sided p-value of less than 0.05. The results are presented in tables and figures to facilitate comparison of nutritional indicators between the two study populations.

2.8 Ethical Considerations

Ethical approval for the study was obtained from the University of Agriculture, Makurdi Research Ethics Committee prior to the commencement of data collection. Additional administrative approval was obtained from the relevant State Ministries of Health and Local Government Authorities in Akwa Ibom and Bayelsa States before the field survey was conducted.

Participation in the study was entirely voluntary. The purpose, objectives, procedures, potential benefits, and minimal risks associated with the survey were clearly explained to all eligible participants in a language they understood. Written informed consent was obtained from the parent or primary caregiver of each eligible child before the interview and anthropometric measurements were conducted. Participants were informed of their right to decline participation or withdraw from the study at any stage without any consequences or loss of benefits.

To ensure confidentiality and protect participants' privacy, no personally identifiable information was collected during the survey. Each household and participant was assigned a unique identification code for data management purposes, and all electronic records were stored in password-protected

databases accessible only to authorized members of the research team. Data were analysed and reported in aggregate form to prevent the identification of individual participants or households.

Children identified with Severe Acute Malnutrition (SAM), bilateral pitting oedema, or other conditions requiring immediate medical attention during the survey were referred to the nearest appropriate health facility for further assessment and management in accordance with the World Health Organization (WHO) and SMART survey guidelines. All study procedures were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki and complied with applicable national guidelines governing research involving human participants.

3.0 Results and Discussion

This section presents the findings of the nutritional survey conducted among children aged 6–59 months in selected communities of Akwa Ibom and Bayelsa States. The results are presented according to survey coverage, prevalence of acute malnutrition by sex and age group, and comparative nutritional indicators based on Mid-Upper Arm Circumference (MUAC) and bilateral pitting oedema.

3.1 Survey Coverage

As presented in Table 4, all 30 planned clusters were successfully surveyed in both Akwa Ibom and Bayelsa States, representing 100% cluster coverage. Household coverage reached 99.0% (380 of 384 households) in Akwa Ibom and 97.0% (371 of 384 households) in Bayelsa. Similarly, the survey achieved Infant and Young Child Feeding (IYCF) coverage of 83.0% and 70.0% in Akwa Ibom and Bayelsa States, respectively. The overall survey achievement rate of approximately 94% demonstrates excellent field implementation and provides confidence that the survey findings are representative of the study populations.

Table 4: Percentage of households and sample coverage in the survey

Indicator	Planned (AKS)	Planned (BYS)	Achieved (AKS)	Achieved (BYS)	Achievement (%) AKS	Achievement (%) BYS
Number of sampled clusters	30	30	30	30	100	100
Number of households	384	384	380	371	99	97
Children aged 0–23.9 months included in the IYCF sample	380	380	314	256	83	70
Overall Average Achievement (%)	—	—	—	—	94	

**** AKS = Akwa Ibom State , BYS = Bayelsa State , IYCF = Infant and Young Child Feeding**
Source: Nutrition-Related KAP Survey Report (April, 2022)

3.2 Results Anthropometry: Prevalence of Acute Malnutrition based on MUAC cut off's (and/or oedema) and by sex.

The nutritional status of children aged 6–59 months was assessed using Mid-Upper Arm Circumference (MUAC) measurements and bilateral pitting oedema in accordance with the WHO 2006 Child Growth Standards and SMART survey guidelines. The prevalence of Global Acute Malnutrition (GAM), Moderate Acute Malnutrition (MAM), and Severe Acute Malnutrition (SAM) was estimated separately for each state and disaggregated by sex and age group.(MEDAIR, 2011).

As shown in Table 5 and Figure 1, the prevalence of Global Acute Malnutrition (GAM) among children aged 6–59 months in Akwa Ibom State was 15.8% (95% CI: 9.8–24.6), while Severe Acute Malnutrition (SAM) was 7.6% (95% CI: 3.3–16.5). According to the WHO and Integrated Food Security Phase Classification (IPC) criteria, the observed GAM prevalence exceeds the emergency threshold of 15%, indicating a critical public health nutrition situation requiring immediate intervention.

Female children exhibited a higher prevalence of both GAM (19.1%) and SAM (8.5%) than male children (11.8% and 6.5%, respectively). Although no formal statistical comparison was performed, the findings suggest that girls were more nutritionally vulnerable than boys during the survey period. Similar sex-related differences have been reported in previous Nigerian nutrition surveys, although the underlying biological and socio-cultural determinants remain poorly understood.

Fig. 1 illustrates the cumulative distribution of MUAC measurements among all children and by sex. The distribution demonstrates a greater concentration of lower MUAC values among female children, consistent with the higher prevalence of acute malnutrition observed in Table 5.

Table 5: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex in Akwa Ibom State

Classification	All (n = 341)	Boys (n = 153)	Girls (n = 188)
Global Acute Malnutrition (GAM) (MUAC <125 mm and/or bilateral oedema)	54 (15.8%) 95% CI: 9.8–24.6	18 (11.8%) 95% CI: 5.9–22.2	36 (19.1%) 95% CI: 12.2–28.8
Moderate Acute Malnutrition (MAM) (MUAC ≥115 mm and <125 mm, no oedema)	28 (8.2%) 95% CI: 5.7–11.6	8 (5.2%) 95% CI: 2.6–10.3	20 (10.6%) 95% CI: 6.8–16.2
Severe Acute Malnutrition (SAM) (MUAC <115 mm and/or bilateral oedema)	26 (7.6%) 95% CI: 3.3–16.5	10 (6.5%) 95% CI: 2.5–15.9	16 (8.5%) 95% CI: 3.8–18.1

((Abbreviations: MUAC = Mid-Upper Arm Circumference; GAM = Global Acute Malnutrition; MAM = Moderate Acute Malnutrition; SAM = Severe Acute Malnutrition; CI = Confidence Interval. Source: Nutrition-Related KAP Survey Report (April, 2022)

Children aged 6–29 months exhibited a higher prevalence of both severe and moderate wasting than older children, indicating greater nutritional vulnerability during infancy and the complementary feeding period. The absence of severe wasting among children aged 30–59 months suggests an improvement in nutritional status with increasing age. These findings are consistent with previous studies reporting that

the risk of acute malnutrition is greatest during the transition from exclusive breastfeeding to complementary feeding.

Fig. 2 further demonstrates that the burden of acute malnutrition was concentrated among younger children, particularly those aged 6–29 months, emphasizing the need for targeted nutrition interventions during early childhood.

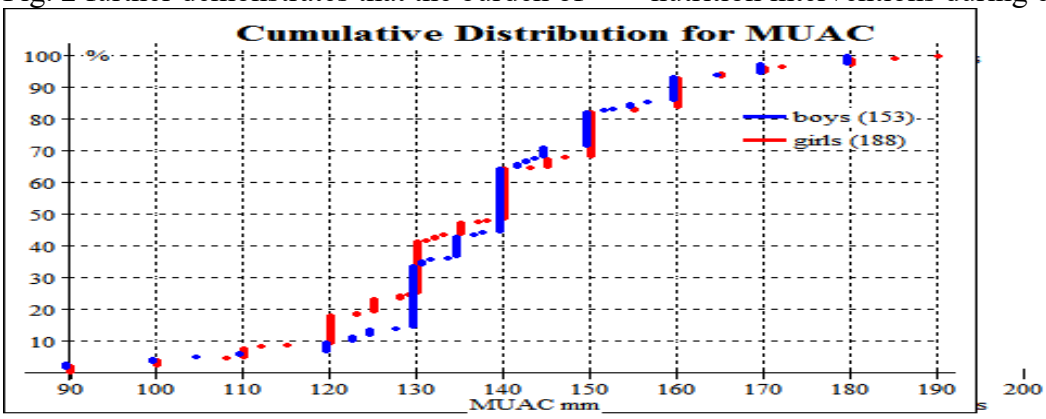

Figure 1: Cumulative distribution for MUAC (0-59) for all children and aggregated by sex in Akwa Ibom

Table 6: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or edema In Akwa Ibom State.

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	142	15	10.6	12	8.5	115	81.0	0	0.0
18-29	117	11	9.4	12	10.3	94	80.3	0	0.0
30-41	31	0	0.0	1	3.2	30	96.8	0	0.0
42-53	24	0	0.0	2	8.3	22	91.7	0	0.0
54-59	27	0	0.0	1	3.7	26	96.3	0	0.0
Total	341	26	7.6	28	8.2	287	84.2	0	0.0

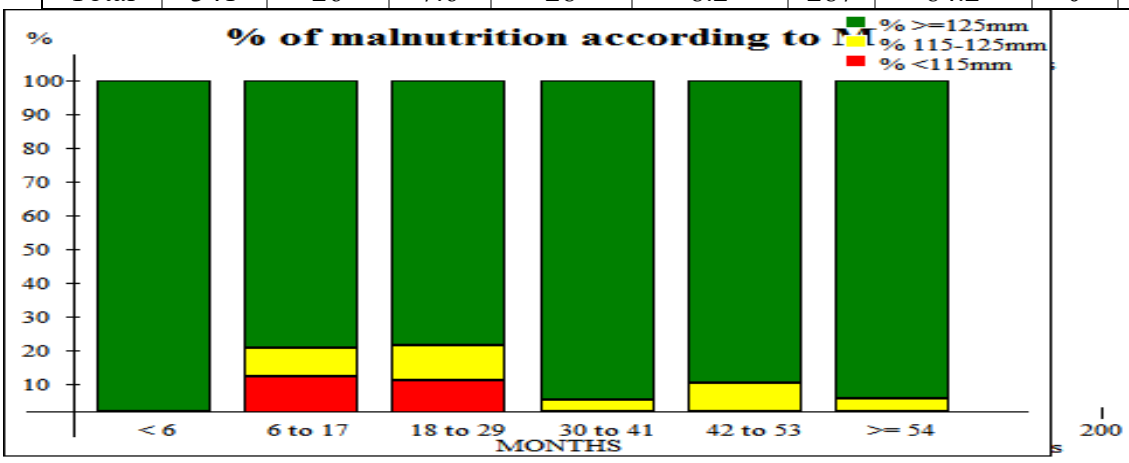

Fig. 2: Percentage of Malnutrition based on MUAC (0-59) by age in Akwa Ibom State

As presented in Table 7 and Fig. 3, the prevalence of Global Acute Malnutrition (GAM) in Bayelsa State was 20.6% (95% CI: 13.9–29.4), while Severe Acute Malnutrition (SAM) was 7.9% (95% CI: 4.1–14.8). The observed GAM prevalence substantially exceeded the WHO emergency threshold of 15%, indicating a critical nutrition situation. Furthermore, the GAM prevalence recorded in Bayelsa was higher than that observed in Akwa Ibom State (20.6% versus 15.8%), suggesting comparatively poorer nutritional conditions among under-five children in Bayelsa during the survey period. Female children also recorded higher prevalences of GAM and SAM than male children, a pattern similar to that observed in Akwa Ibom State. This consistency suggests that sex-related differences in acute malnutrition may warrant further investigation within similar population settings.

Fig. 3 illustrates the cumulative MUAC distribution by sex and supports the higher prevalence of acute malnutrition observed among female children.

The markedly higher prevalence of severe and moderate wasting among children aged 6–17 months underscores the importance of improving infant and young child feeding practices, timely introduction of adequate complementary foods, and community-based nutrition interventions during this critical stage of growth.

Table 7: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex in Bayelsa State

Classification	All (n = 316)	Boys (n = 152)	Girls (n = 164)
Global Acute Malnutrition (GAM) (MUAC <125 mm and/or bilateral oedema)	65 (20.6%) 95% CI: 13.9–29.4	28 (18.4%) 95% CI: 11.6–28.0	37 (22.6%) 95% CI: 14.3–33.7
Moderate Acute Malnutrition (MAM) (MUAC ≥115 mm and <125 mm, no oedema)	40 (12.7%) 95% CI: 9.0–17.5	17 (11.2%) 95% CI: 6.8–17.9	23 (14.0%) 95% CI: 9.3–20.5
Severe Acute Malnutrition (SAM) (MUAC <115 mm and/or bilateral oedema)	25 (7.9%) 95% CI: 4.1–14.8	11 (7.2%) 95% CI: 3.3–15.3	14 (8.5%) 95% CI: 4.2–16.5

Abbreviations: MUAC = Mid-Upper Arm Circumference; GAM = Global Acute Malnutrition; MAM = Moderate Acute Malnutrition; SAM = Severe Acute Malnutrition; CI = Confidence Interval. (Source: Nutrition-Related KAP Survey Report (April, 2022))

As presented in Table 9 above and Figure 3, the prevalence of GAM as per MUAC among children 6-59 months in Bayelsa State is 20.6 % (13.9 - 29.4 95% C.I.) and that of SAM is 7.9 % (4.1 - 14.8 95% C.I.) which are at critical stages at the moment, based on the IPC classification The study revealed that the prevalence rate for GAM among the girls: 22.6 % (14.3 - 33.7 95% C.I.) is higher than that for boys: 18.4 % (11.6 - 28.0 95% C.I.), this is also applicable in the SAM cases based on MUAC. Incidentally, this same scenario played out in the NNHS 2018 survey. However, many surveys have shown that MUAC is more sensitive to detecting cases among female children than among male children in the younger age category (6-29 months); they are mostly identified by MUAC compared to the older age category (30-59 months). This can also be seen in the cumulative distribution of the MUAC chart for all children and, aggregated by sex, in Fig. 3.

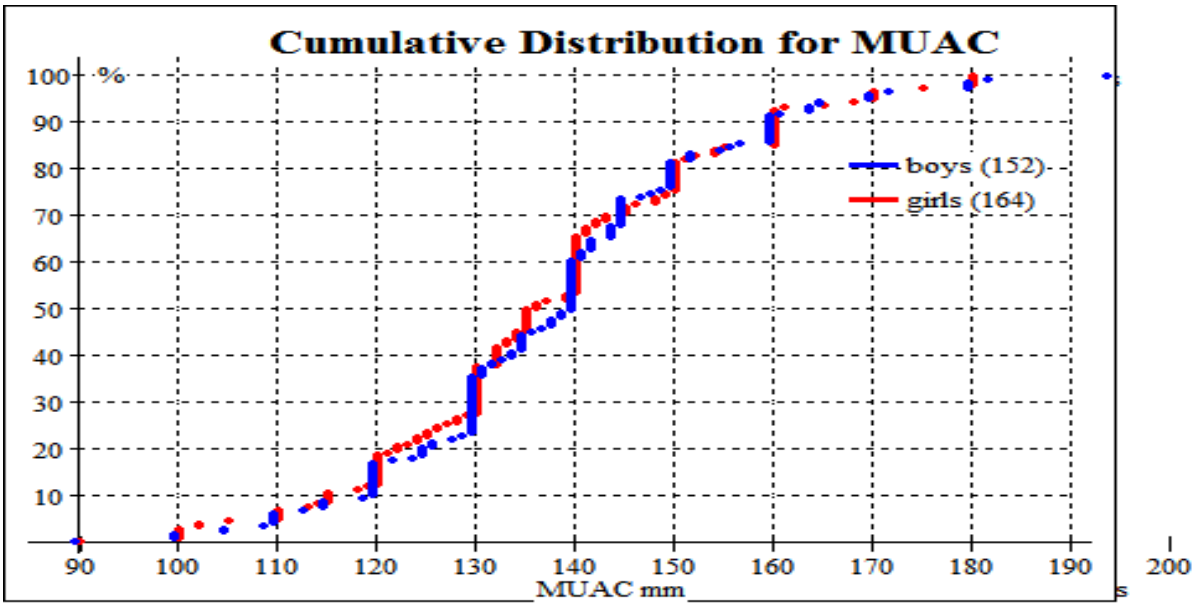

Fig. 3: Cumulative distribution for MUAC (0-59) for all children and aggregated by sex in Bayelsa State.

As presented in Table 8 and Fig. 4, the prevalence of acute malnutrition in Bayelsa State varied considerably across the different age groups. Children aged 6–17 months exhibited the highest prevalence of severe wasting (15.1%) and moderate wasting (23.5%), indicating that they were the most nutritionally vulnerable group. In contrast, the prevalence of severe wasting declined markedly with increasing age and was not observed among children aged 42–59 months. From the study, , 7.9% of the children were classified as severely wasted, 12.7% as moderately wasted, and 79.4% had normal nutritional status, while no cases of bilateral pitting oedema were recorded. These findings suggest that the risk of acute malnutrition was greatest during early childhood, particularly during the period of transition from exclusive breastfeeding to complementary feeding, underscoring the need for targeted infant and young child feeding interventions and strengthened community-based nutrition programmes in Bayelsa State.

3.3 Comparative Nutritional Status between Akwa Ibom and Bayelsa States

A comparison of the two study areas indicates that Bayelsa State consistently recorded higher prevalences of Global Acute Malnutrition (20.6% versus 15.8%), Moderate Acute Malnutrition (12.7% versus 8.2%), and Severe Acute Malnutrition (7.9% versus 7.6%) than Akwa Ibom State. Although both states fall within the WHO critical category for Global Acute Malnutrition, the relatively poorer nutritional indicators observed in Bayelsa may reflect differences in household food security, access to healthcare services, environmental conditions, and socioeconomic characteristics associated with its predominantly riverine setting. These findings highlight the need for location-specific nutrition interventions rather than uniform regional strategies.

Table 8: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema in Bayelsa State.

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (month)	Tota l no.	No.	%	No.	%	No.	%	No.	%
6-17	119	18	15.1	28	23.5	73	61.3	0	0.0
18-29	87	6	6.9	9	10.3	72	82.8	0	0.0
30-41	47	1	2.1	1	2.1	45	95.7	0	0.0
42-53	41	0	0.0	2	4.9	39	95.1	0	0.0
54-59	22	0	0.0	0	0.0	22	100.0	0	0.0
Total	316	25	7.9	40	12.7	251	79.4	0	0.0

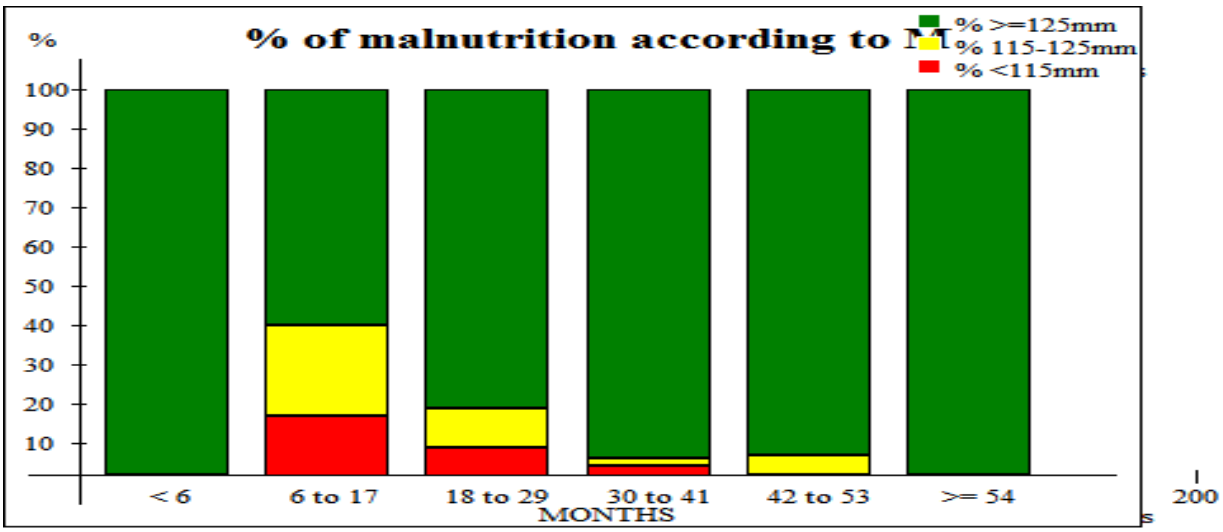

Fig. 4: Percentage of Malnutrition based on MUAC (0-59) by age in Bayelsa State

4. 0 Conclusion

This study provides a comparative assessment of the nutritional status of children aged 6–59 months in selected communities of Akwa Ibom and Bayelsa States using Mid-Upper Arm Circumference (MUAC) and bilateral pitting oedema as indicators of acute malnutrition. The high survey coverage achieved in both states supports the reliability and representativeness of the findings.

The results revealed that both Akwa Ibom and Bayelsa States experienced critical levels of Global Acute Malnutrition (GAM) according to the World Health Organization (WHO) and Integrated Food Security Phase Classification (IPC) criteria. Bayelsa State recorded a higher prevalence of Global Acute Malnutrition and Moderate Acute Malnutrition than Akwa Ibom State, indicating a comparatively greater burden of childhood undernutrition. In both states, female children exhibited higher prevalences of acute malnutrition than male children, while children aged 6–29 months constituted the most nutritionally vulnerable age group, emphasizing the importance of adequate infant and young child feeding practices during the complementary feeding period.

The findings demonstrate that acute malnutrition remains a significant public health

concern in both states and highlight the need for sustained, evidence-based nutrition interventions. Strengthening community-based management of acute malnutrition, improving infant and young child feeding practices, expanding routine nutrition screening using MUAC, promoting caregiver nutrition education, and enhancing access to quality primary healthcare services are essential for reducing the burden of acute malnutrition among under-five children. In addition, periodic nutrition surveillance should be institutionalized to monitor trends, identify vulnerable populations, and guide timely policy decisions and resource allocation for effective nutrition programming.

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The author carried out all components of the work