

Analysis of Infants, Young Children, and Women of Reproductive Age Feeding Profile in Selected Locations in 2022: A Case Study of Akwa Ibom and Bayelsa States, Nigeria

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Abstract: *In the study, we assessed the nutritional profile of Infants and Women of Reproductive Age in selected locations in Akwa Ibom and Bayelsa States. And based on the results, we found that about 56% and 54% of the infants in Akwa Ibom and Bayelsa states, respectively, were initiated into early breastfeeding within the first 1 hour after birth. Only 33.4% and 46.4% of children under six months old in Akwa Ibom and Bayelsa states, respectively, are currently being excessively breastfed. About 92.3% and 83.2% of infants received soft/semi-solid foods and were initiated on complementary feeding in Akwa Ibom and Bayelsa states, respectively. Only 52.6% and 22.1% of children in the age category of (6-23.9) months met the minimum Dietary Diversity in Akwa Ibom and Bayelsa states, respectively. About 31.1% and 45.2% of children were found not to have met the minimum requirement for dietary diversity and received food from only 1-4 food groups in Akwa Ibom and Bayelsa States, respectively. Only 40.9% of (6-23.9) months old children in Akwa Ibom State and 47.7% in Bayelsa State had adequate meal frequency for their age group during the survey period. In Akwa Ibom State, about 72.9% of the sampled children received a minimum acceptable diet, while in Bayelsa State, only 48.5% received one. The majority of the women of childbearing age in the two states, Akwa Ibom: 58.5% and Bayelsa: 62.0%, hold secondary school certificates, while about 4.0% and 6.4% respectively did not attend any school at all. The prevalence of acute malnutrition based on Mid-upper-Arm Circumference (MUAC) (< 190 mm) among women (15-49 years in Akwa Ibom State is 0.5% and 2.0% in Bayelsa State. However, the 2.0% acute malnutrition prevalence for women*

in Bayelsa State is critical and of great concern. The percentage of women at risk of acute malnutrition based on the MUAC cut-off (≥ 190 mm and ≤ 230 mm) is currently 11.8% in Akwa Ibom and 12.2% in Bayelsa. About 20.5% of pregnant women in Akwa Ibom and 5.6% in Bayelsa are at risk of malnutrition. In AKS: 10.6% and BYS: 15.6% of women who are lactating are at risk of malnutrition, while about 30.8% of pregnant and lactating women in Akwa Ibom alone are at risk of malnutrition.

Keywords: *Infants, Acute Malnutrition, Women of Reproductive Age, Early Breastfeeding, Exclusive Breastfeeding, Soft/Semi-solid food, Complementary feeding, Minimum Dietary Diversity, Minimum Acceptable Diet.*

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1.0 Introduction

Optimal nutrition during infancy, early childhood, and the reproductive years is fundamental to human growth, health, and socio-economic development. The first 1,000 days of life—from conception to a child's second birthday—represent a critical window during which adequate nutrition significantly influences physical growth, cognitive development, immune competence, and long-term health outcomes. Poor infant and young

child feeding (IYCF) practices during this period increase the risk of malnutrition, morbidity, mortality, impaired cognitive development, poor educational attainment, and reduced economic productivity later in life (United Nations Children's Fund [UNICEF], World Health Organization [WHO], & World Bank Group, 2023; World Health Organization [WHO], 2009). Consequently, improving maternal nutrition and promoting appropriate feeding practices have become central strategies for achieving Sustainable Development Goal (SDG) 2 (Zero Hunger) and SDG 3 (Good Health and Well-being).

The World Health Organization (WHO) and UNICEF introduced the Global Strategy for Infant and Young Child Feeding (IYCF) in 2002 to provide evidence-based recommendations aimed at improving child survival and nutritional status worldwide. The strategy recommends initiating breastfeeding within the first hour after birth, exclusive breastfeeding for the first six months of life, continued breastfeeding up to two years or beyond, and the timely introduction of nutritionally adequate, safe, and appropriate complementary foods from six months while continuing breastfeeding (WHO, 2009). Early initiation of breastfeeding promotes neonatal survival by providing colostrum, enhancing immunity, and reducing exposure to infectious diseases. Likewise, exclusive breastfeeding during the first six months substantially lowers the incidence of diarrhoeal diseases, respiratory infections, childhood malnutrition, and mortality while supporting optimal cognitive and neurological development (WHO, 2021).

Despite these recommendations, inappropriate infant feeding practices remain a major public health challenge globally, particularly in low- and middle-income countries. UNICEF (2023) estimates that millions of infants worldwide are not breastfed within the first hour of birth, while fewer than half of infants younger than

six months are exclusively breastfed. Inadequate complementary feeding, characterized by poor dietary diversity, insufficient meal frequency, and low nutrient density, further contributes to childhood undernutrition, micronutrient deficiencies, impaired growth, and increased susceptibility to infectious diseases. The coexistence of undernutrition with overweight and obesity—the double burden of malnutrition—has emerged as an additional concern in many developing countries, including Nigeria (UNICEF et al., 2023).

Nigeria continues to experience one of the highest burdens of maternal and child malnutrition globally despite considerable investments in maternal and child health programmes. The country contributes substantially to global under-five mortality and remains off-track in achieving several nutrition-related Sustainable Development Goals. Childhood malnutrition, particularly stunting, wasting, and underweight, continues to be widespread, while maternal undernutrition and micronutrient deficiencies adversely affect pregnancy outcomes, infant growth, and child survival (Adeyinka, 2020). National evidence indicates that improvements in child survival are strongly influenced by maternal education, household wealth, access to healthcare services, appropriate birth spacing, and adequate infant feeding practices. However, existing disparities across geographical regions and socio-economic groups continue to hinder progress toward reducing child mortality and improving nutritional outcomes.

Several studies have documented the relationship between infant feeding practices and nutritional outcomes. Khaliq et al. (2022) demonstrated that exclusive breastfeeding significantly reduces the risk of coexisting forms of malnutrition among infants younger than six months, whereas early introduction of



complementary foods and complete weaning substantially increase the likelihood of multiple forms of undernutrition. Similarly, Woldeamanuel et al. (2022) reported that higher breastfeeding performance among Ethiopian mothers was associated with improved infant nutritional outcomes, emphasizing the importance of adherence to recommended breastfeeding practices. In Sierra Leone, Blango et al. (2022) observed that although breastfeeding was commonly initiated shortly after birth, exclusive breastfeeding was often discontinued prematurely because of early introduction of complementary foods, largely driven by poor socio-economic conditions and inadequate maternal knowledge.

Within Nigeria, spatial analyses have revealed considerable geographical disparities in childhood malnutrition. Adebayo and Gayawan (2021) found significant regional variations in the prevalence of stunting and wasting, with evidence of a north–south divide and marked state-level differences in nutritional outcomes. Their findings underscore the need for localized nutritional assessments to guide context-specific interventions rather than relying solely on national averages. Furthermore, Adeyinka (2020) highlighted that maternal education, household socio-economic status, healthcare utilization, birth spacing, and community-level factors are critical determinants of child survival and nutritional well-being in Nigeria. These findings suggest that improving infant feeding practices requires a comprehensive understanding of both household and community-level determinants.

Studies conducted in southern Nigeria further demonstrate the coexistence of child undernutrition and maternal overnutrition, reflecting the country's growing double burden of malnutrition. Maziya-Dixon et al. (2020) reported that over one-third of children in

Akwa Ibom State were stunted, while a substantial proportion of mothers were overweight or obese. The study emphasized the importance of strengthening routine nutritional surveillance systems to generate timely evidence for programme planning and policy formulation. However, much of the available evidence has focused primarily on anthropometric indicators, with comparatively limited attention given to comprehensive infant and young child feeding indicators, dietary diversity, meal frequency, complementary feeding practices, and the nutritional status of women of reproductive age within the same population.

Although national surveys such as the Nigeria Demographic and Health Survey (NDHS) and the Multiple Indicator Cluster Survey (MICS) provide valuable information on maternal and child nutrition, state-specific analyses remain limited, particularly for the South-South geopolitical zone. Moreover, relatively few studies have simultaneously examined infant feeding practices, complementary feeding indicators, dietary diversity, meal frequency, minimum acceptable diet, and maternal nutritional status among women of reproductive age in Akwa Ibom and Bayelsa States using recent data. This lack of comprehensive state-level evidence constrains the development of targeted nutrition interventions tailored to the unique demographic, socio-economic, and cultural characteristics of these states.

Against this background, the present study assessed the feeding profile and nutritional status of infants, young children, and women of reproductive age in selected locations in Akwa Ibom and Bayelsa States using data collected in 2022. Specifically, the study evaluated key WHO-recommended Infant and Young Child Feeding (IYCF) indicators, including early initiation of breastfeeding, exclusive breastfeeding, complementary feeding,



minimum dietary diversity, minimum meal frequency, minimum acceptable diet, and the nutritional status of women based on Mid-Upper Arm Circumference (MUAC). By providing recent state-level evidence, the study contributes to a better understanding of maternal and child nutrition practices in southern Nigeria and provides valuable information for policymakers, programme managers, development partners, and public health practitioners seeking to strengthen nutrition interventions, improve child survival, and accelerate progress toward achieving national nutrition targets and the Sustainable Development Goals.

2.0 Materials and Methods

2.1 Study Area and Population

The study was conducted in Akwa Ibom and Bayelsa States, located in the South-South geopolitical zone of Nigeria. Akwa Ibom State covers a land area of approximately 8,412 km² and is bounded by Abia State to the north, Rivers State to the east, Cross River State to the west, and the Atlantic Ocean to the south. It comprises 31 Local Government Areas (LGAs) and has the longest coastline in Nigeria. Bayelsa State is situated in the riverine Niger Delta region and is bounded by Rivers State to the east, Delta State to the west, and the Atlantic Ocean to the south. The state has a land area of approximately 10,773 km² and comprises eight Local Government Areas (LGAs).

The study population consisted of households with infants and young children aged 0–23.9 months and women of reproductive age (15–49 years) residing in selected LGAs of the two states. Eight LGAs were selected from Akwa Ibom State and four LGAs from Bayelsa State, giving a total of 12 LGAs included in the survey. The estimated survey populations for the selected LGAs were 1,385,200 in Akwa Ibom State and 1,131,900 in Bayelsa State, corresponding to 345,800 and 323,399

households, respectively, as presented in Tables 1 and 2.

Within the selected LGAs, households were organized into sampling clusters (political wards). A total of 30 clusters were selected using Probability Proportional to Size (PPS) based on the ENA for SMART (Version 2020, updated January 11, 2020) cluster assignment methodology. This sampling approach ensured that clusters with larger populations had a proportionately greater probability of selection, thereby enhancing the representativeness of the survey sample.

Table 1: Estimated Population for Akwa Ibom Survey Population

LGAs	Household Size* (4.0 NNHS,2018)	Population Size
Ibendo	26,275	105,100
Ikot	49,675	198,700
Ekpene		
Mbo	35,875	143,500
Okobo	36,100	144,400
Oron	30,625	122,500
Udung	18,625	74,500
Uko		
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)



2.2 Sampling Method and Sample Size Calculation

This study employed a cross-sectional survey design using a two-stage cluster sampling technique based on Probability Proportional to Size (PPS), a sampling approach widely recommended for nutrition Knowledge, Attitudes, and Practices (KAP) surveys because it ensures that larger communities have a proportionately greater chance of selection (UNICEF Malawi, 2021). In the first stage, 30 clusters (political wards) were selected using the ENA for SMART (Version 2020) cluster assignment methodology, while households were selected systematically within each cluster during the second stage.

The sample size for the Infant and Young Child Feeding (IYCF) assessment was determined following the procedures outlined in *Infant and Young Child Feeding Practices: Collecting and Using Data—A Step-by-Step Guide* (CARE USA, 2010). The GNU Sample Size Calculator was used, assuming a 30×20 cluster design, a design effect of 1.5, and a precision level of 10%. The estimated prevalence of five key IYCF indicators—exclusive breastfeeding, early initiation of breastfeeding, minimum dietary diversity, minimum meal frequency, and minimum acceptable diet—was obtained from the 2018 National Nutrition and Health Survey (NNHS). The expected prevalence estimates and the

corresponding sample sizes for both Akwa Ibom and Bayelsa States are presented in Table 3.

To ensure adequate representation across all age categories of children aged 0–23.9 months, the largest calculated sample size (95 children for early initiation of breastfeeding) was adopted and multiplied by four to account for the four age groups (0–5, 6–11, 12–17, and 18–23 months), resulting in a minimum required sample size of 380 children. In addition, all eligible women of reproductive age (15–49 years), including pregnant and lactating women (PLW), residing in the selected households were assessed for nutritional status using Mid-Upper Arm Circumference (MUAC) measurements. This approach aligned the maternal nutrition assessment with the IYCF survey since mothers and caregivers of children aged 0–23.9 months constituted the primary study population. Women with MUAC <190 mm were classified as acutely malnourished, while those with MUAC between 190 mm and 230 mm were considered at risk of malnutrition. Approximately 13 households were surveyed per cluster by each field team per day. Based on the minimum sample size of 380 households, a total of 30 clusters ($380 \div 13 \approx 29.2$) were required and subsequently surveyed to ensure adequate coverage and representativeness of the study population.

Table 3: IYCF Indicator's Expected Prevalence and Sample Sizes

Indicators	Current Prevalence		Precision	Sample Size	
	Akwa Ibom	Bayelsa		Akwa Ibom	Bayelsa
Exclusive Breast feeding	34.1%	34.1%	10%	87	87
Early Initiation of Breastfeeding	43.7%	44.8%	10%	95*	95*
Minimum dietary diversity	38.2%	34.7%	10%	91	88
Minimum meal frequency	24.4%	20.4%	10%	71	63
Minimum acceptable diet	9.8%	7.1%	10%	34	26

Source: NNHS Survey of 2018



As shown in Table 3, the largest estimated sample size among the five IYCF indicators was 95, corresponding to the indicator *Early Initiation of Breastfeeding*. Following the recommendations of the *Infant and Young Child Feeding Practices: Collecting and Using Data—A Step-by-Step Guide* (CARE USA, 2010) and previous SMART nutrition surveys (Ekpo et al., 2019; Ekpo & Ikughur, 2021), this value was multiplied by four to ensure adequate representation across the four age categories of children (0–5, 6–11, 12–17, and 18–23 months). This yielded a minimum sample size of 380 children aged 0–23.9 months for the IYCF assessment across the two study states. Based on an average workload of approximately 13 households per field team per day, a minimum of 30 sampling clusters ($380 \div 13 \approx 29.2$) was required and consequently surveyed to achieve the desired sample size.

2.3 Training and supervision

This survey was conducted by a team of eighteen trained enumerators and supervisors, comprising twelve enumerators based in Akwa Ibom State and six in Bayelsa State. Each enumerator was assigned to a familiar Local Government Area (LGA), with support from a designated focal person for guidance. The enumerators and supervisors underwent training in accordance with the Interim Guidelines issued on October 8, 2020, concerning population-level surveys and household data collection during the COVID-19 pandemic (SMART, October, 2020). The training focused extensively on an overview of nutrition surveys in the context of COVID-19; techniques for age estimation; sampling principles; measurement methodologies using MUAC tapes; data collection procedures for Knowledge, Attitudes, and Practices (KAP) surveys; potential biases; and the utilization of the Kobocollect toolbox. At the conclusion of the training, participants underwent a pre-test/role-play and a standardization test, which

guided the formation of teams based on their results.

2.4 Data collection

Data on the variables of interest, such as age, sex, and women's MUAC, were collected during the interview, including data on the targeted IYCF practice of the children (0-23.9) months within the target populations in the two States of Akwa Ibom and Bayelsa at the time of the survey. Information about them was gathered from their mothers or caregivers, as the case may be. Here, the outcomes on early initiation of breastfeeding (EIB), Exclusive breastfeeding (EBF), Introduction to Complimentary food: solid, semi-solid or soft food for children within (6-8.9) months, Minimum Dietary Diversity (MDD) among children (6-23.9) months, Minimum Meal Frequency (MMF) among children 6-23.9 months and Minimum Acceptable Diet (MAD) among children 6-23.9 months collected.

2.5 Data Quality Assurance

Multiple procedures were implemented to ensure data quality throughout the survey process. Skilled data collectors received standardized training, and a Nutrition expert with experience in at least two Nutrition-related surveys within the past three years was included in the team. The team supervisor or leader conducted systematic monitoring and manual checks and used immunization cards and birth certificates for age verification. Reference forms and notes were employed to ensure concordance, while cluster control and household selection forms facilitated triangulation. Enumerators were motivated to perform their duties diligently and without compromise. Prior to departing each community, team members verified that all team identification variables, including codes and dates, were accurately completed on the electronic questionnaires.



2.6 Data Processing and Statistical Analysis

Datasets were cleaned and analyzed daily using ENA for SMART software (version 2020, updated on 11 January 2020), Microsoft Excel, and SPSS. Cleaning logs were maintained to document all modifications from the original raw data. Respondent ages were recorded in months for children aged 0 to 59 months and in years for adult respondents, including pregnant and lactating mothers. All necessary measures were implemented to ensure the privacy of respondents. Statistical analyses followed the guidelines outlined in Indicators for assessing infant and young child feeding practices: definitions and measurement methods (World Health Organization and United Nations Children's Fund, 2021).

2.7 Ethical Consideration

Multiple measures were implemented to protect confidentiality, secure informed consent, and minimize potential adverse consequences for participants. Confidentiality procedures were explicitly communicated, and permission was obtained from interviewees to record their responses in the survey database. All household interviews were conducted in open spaces to maintain confidentiality and prevent overcrowding. Direct oral interviews with children were strictly avoided due to concerns regarding child consent. The informed consent note, which specifically addressed confidentiality, was thoroughly presented. Survey questions were carefully worded to avoid causing respondents to feel threatened. Ethical approval for the survey was obtained for both Akwa Ibom State and Bayelsa State.

3.0 Results and Discussion

In this section, we present survey results and findings based on data collected on Infant Young Child Feeding (IYCF) practices among children aged 0-23.9 months in the target

populations of Akwa Ibom and Bayelsa States at the time of the survey. Information was gathered from their mothers or caregivers, as applicable. The findings on early initiation of breastfeeding (Table 4 and Figs 1–2), exclusive breastfeeding (Table 5 and Figs 3–4), introduction of complementary feeding (Table 6 and Figs 5–6), minimum dietary diversity (Table 7), minimum meal frequency (Table 8), minimum acceptable diet (Table 9), educational status of women (Figs 7–8), nutritional status of women based on MUAC (Table 11), and physiological status of women of reproductive age (Table 12) are presented and discussed in this section.

3.1 Early Initiation of Breastfeeding

The early initiation of breastfeeding, typically achieved by putting newborns to the breast within the first hour of life, is critical to newborn survival and to establishing breastfeeding over the long term. When breastfeeding is delayed after birth, the consequences can be life-threatening, and the longer newborns are left without being breastfed, the greater the risk. This early initiation helps the baby obtain colostrum, which provides the first antibodies that help keep the baby healthy.

3.2 Exclusive Breastfeeding

Exclusive breastfeeding (EBF) is the proportion of infants 0–5 months of age who are being fed exclusively with breast milk. To be exclusively breastfed means that no other food or drink, not even water, except breast milk (including milk from a milk bank or wet nurse), is given to the child for the first 6 months of life, but it may allow the infant to receive ORS, drops, and syrups (vitamins, minerals, and medicines). An exclusively breastfed child is 14 times less likely to die in the first six months than a non-breastfed child, and breastfeeding drastically reduces the chances of deaths from acute respiratory



infection (ARI) and diarrhea, the two major child killers (The Lancet Series, 2008).

The distribution of the time of breastfeeding initiation among children in Akwa Ibom and

Bayelsa States is presented in Table 4, while the corresponding graphical presentations are shown in Figs. 1 and 2.

Table 4: Early Initiation of Breastfeeding

How long after delivery was child put to the breast/nipple?	Number of Children		Percentage (%)	
	AKS	BYS	AKS	BYS
Less than 1 hour	170	140	55.6	53.6
1-24 hours	95	50	31.0	19.2
More than 24 hours	32	66	10.5	25.3
Don't Know	9	5	2.9	1.9
Grand Total	306	261	100.0%	100.0%

Source: Nutrition-Related KAP Survey Report (April, 2022)

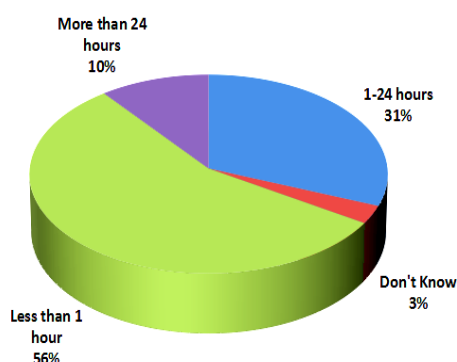


Fig. 1: Akwa Ibom State EIB Chart

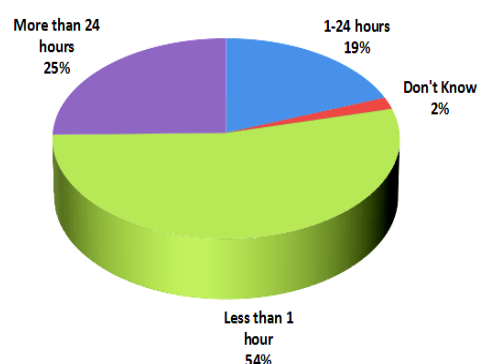


Fig. 2: Bayelsa State EIB Chart

Table 5: Exclusive Breastfeeding

Did child drink any of the following liquids yesterday during the day or at night? Water, sugar water, fruit juice/coconut water, container or powdered milk, curd, infant/baby formula?	Number of Children		Percentage (%)	
	AKS	BYS	AKS	BYS
Yes	34	38	66.6%	53.6%
No	17	33	33.4%	46.4%
Grand Total	51	61	100.0	100.0%

Source: Nutrition-Related KAP Survey Report (April, 2022)



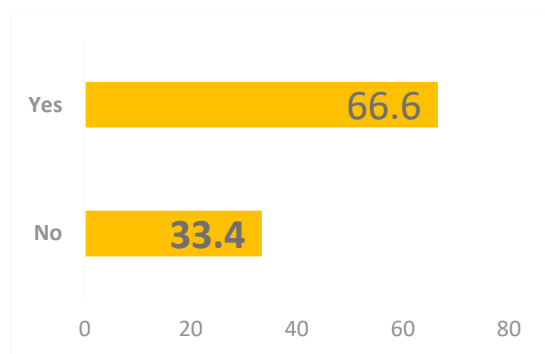


Fig. 3: Akwa Ibom State EBF Chart

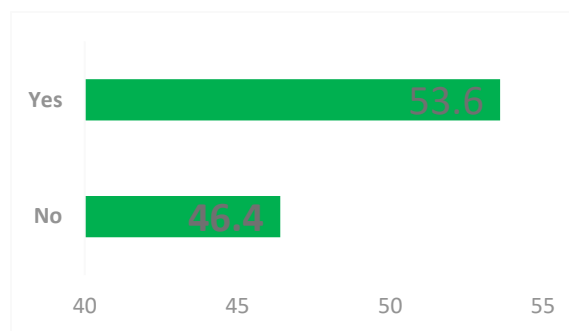


Fig. 4: Bayelsa State EBF Chart

3.3 Introduction to Complimentary food: solid, semi-solid or soft food (6-8.9) months

The moment a child reaches 6 months of age, breast milk alone is no longer sufficient to meet the infant's nutritional needs, so it becomes necessary to introduce age-specific complementary feeding practices to enhance overall growth. This initiation has to be timely, nutritious (quantity- and quality-wise), safe, consistent, and frequent. In order to capture this category of feeding practice, infants who were

(6-8.9) months, i.e., below 9 months old at the time of the study, were targeted. Their mothers/caregivers were asked whether they fed the infants soft/semi-solid food the previous day.

The proportion of children aged 6–8.9 months who received complementary foods is summarized in Table 6, while Figs. 5 and 6 present the graphical distribution of the results for Akwa Ibom and Bayelsa States, respectively.

Table 6: Complimentary food: solid, semi-solid or soft food (6-8.9) months

Did child receive any soft/semi-solid/solid food yesterday during the day or at night?	Number of Children		Percentage (%)	
	AKS	BYS	AKS	BYS
Yes	48	49	92.3%	83.2%
No	4	8	7.7%	13.5%
Don't Know	0	2	0%	3.3%
Grand Total	52	59	100.0%	100.0%

Source: Nutrition-Related KAP Survey Report (April, 2022)

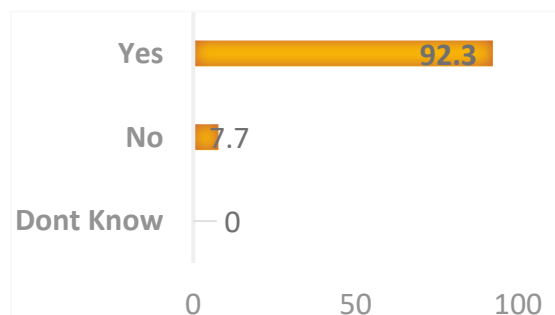


Fig. 5: Akwa Ibom State Complimentary food Chart.

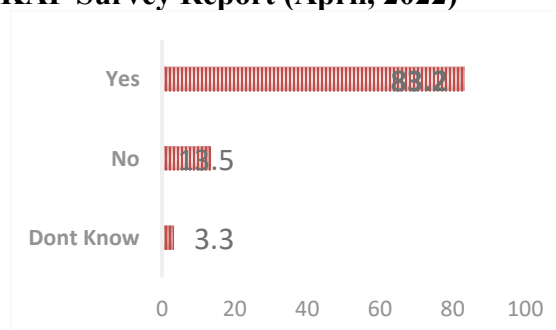


Fig. 6: Bayelsa State Complimentary food Chart.



3.4 Minimum Dietary Diversity (6-23.9 months)

This refers to the percentages of children aged 6–23.9 months who consumed foods and beverages from at least 5 of 9 defined food groups on the previous day. WHO/UNICEF guiding principles for feeding the breastfed child and non-breastfed child recommend that children aged 6–23.9 months be fed a variety of foods to ensure that nutrient needs are met. Food group diversity is often associated with improved linear growth in young children. A

diet lacking in diversity can increase the risk of micronutrient deficiencies, which may lead to damaging effects on children's physical and cognitive development. Little or no consumption of nutrient-dense foods, such as eggs, dairy products, fruits, and vegetables, between 6 and 23 months of age was associated with stunting (World Health Organization and the United Nations Children's Fund, 2021). The results for minimum dietary diversity among children aged 6–23.9 months are presented in Table 7.

Table 7: Minimum Dietary Diversity (6-23.9) months

Category of Dietary Diversity	Number of Children		Percentage (%)	
	AKS	BYS	AKS	BYS
0 - Food Group	46	86	16.3%	32.7%
1 - Food Group	8	13	2.8%	4.9%
2 - Food Group	25	34	8.9%	12.9%
3 - Food Group	27	30	9.6%	11.4%
4 - Food Group	28	42	9.9%	16.0%
5 - Food Group	34	31	12.1%	11.8%
6 - Food Group	31	12	11.0%	4.6%
7 - Food Group	23	9	8.2%	3.4%
8 - Above	60	6	21.3%	2.3%
Grand Total	282	263	100.0%	100.0%

Source: Nutrition-Related KAP Survey Report (April, 2022)

3.5 Minimum Meal Frequency (MMF) 6-23.9 months old children

Minimum Meal Frequency (MMF) refers to the proportion of children aged 6–23.9 months who receive solid, semi-solid, or soft foods (including milk feeds for non-breastfed children) at least the minimum number of times during the previous day, according to their age and breastfeeding status. The World Health Organization (WHO) recommends that breastfed infants aged 6–8.9 months receive complementary foods 2–3 times daily, while breastfed children aged 9–23.9 months should

receive complementary foods 3–4 times daily, with one or two additional nutritious snacks when appropriate. Non-breastfed children aged 6–23.9 months should receive 4–5 meals per day to adequately meet their energy and nutrient requirements. Feeding children less frequently than recommended may result in inadequate dietary intake, thereby increasing the risk of growth faltering, stunting, and micronutrient deficiencies (World Health Organization & United Nations Children's Fund, 2021).

The distribution of children according to the recommended minimum meal frequency is presented in Table 8. The results indicate that



40.9% of children in Akwa Ibom State and 47.7% in Bayelsa State met the recommended minimum meal frequency during the survey period. Conversely, a considerable proportion of children in both states failed to meet the recommended feeding frequency, particularly

among non-breastfed children. These findings highlight the need to strengthen nutrition education and behaviour change interventions aimed at improving complementary feeding practices among caregivers.

Table 8: Minimum Meal Frequency (MMF) 6-23.9 months children

Minimum Meal Frequency 6 - 23.9 Months	Number of Children		Percentage (%)	
	AKS	BYS	AKS	BYS
2 times for breastfed infants 6 - 8.9 months	33	13	15.3%	10.2%
3 times for breastfed children 9 - 23.9 months	46	29	21.4%	22.7%
4 times for non-breastfed children 6–23.9 months	9	19	4.2%	14.8%
Less than 2 times for breastfed infants 6–8.9 months	4	7	1.9%	5.5%
Less than 3 times for breastfed children 9–23.9 months	38	25	17.7%	19.5%
Less than 4 times for non-breastfed children 6–23.9 months	85	35	39.5%	27.3%
Grand Total	215	128	100.00%	100.00%

Source: Nutrition-Related KAP Survey Report (April, 2022)

3.6 Minimum Acceptable Diet (MAD) 6-23.9 months

The Minimum Acceptable Diet (MAD) is a composite Infant and Young Child Feeding (IYCF) indicator that combines minimum dietary diversity and minimum meal frequency. For non-breastfed children, the indicator also requires the consumption of at least two milk feeds during the previous day. This indicator reflects both the quality and quantity of children's diets and is widely used to assess the adequacy of complementary feeding practices

(World Health Organization & United Nations Children's Fund, 2021).

The results presented in Table 9 show that 72.9% of children aged 6–23.9 months in Akwa Ibom State received a minimum acceptable diet during the survey period, compared with 48.5% in Bayelsa State. Although the findings suggest relatively better complementary feeding practices in Akwa Ibom State, the lower prevalence observed in Bayelsa State indicates the need for targeted nutrition interventions to improve both dietary diversity and feeding frequency among young children.

Table 9: Minimum Acceptable Diet (MAD) 6-23.9 months

Minimum acceptable diet 6 - 23.9 months	No. of Children		Percentage (%)	
	AKS	BYS	AKS	BYS
Breastfed children 6 - 23.9 with minimum acceptable diet	80	46	36.2%	23%
Breastfed children 6 - 23.9 with no minimum acceptable diet	41	62	18.6%	31%
Non Breastfed 6 - 23.9 with minimum acceptable diet	81	51	36.7%	25.5%
Non Breastfed 6 - 23.9 with no minimum acceptable diet	19	41	8.6%	20.5%
Grand Total	221	200	100%	100%



3.7 Maternal Nutritional Characteristics of Women of Reproductive Age (15–49 Years)

The nutritional well-being of women of reproductive age plays a critical role in maternal and child health outcomes. During the survey, women aged **15–49 years**, including pregnant and lactating women, were assessed to determine their educational attainment, physiological status, and nutritional status using Mid-Upper Arm Circumference (MUAC). The educational profile of respondents is presented in **Table 10**, while the corresponding graphical distributions for Akwa Ibom and Bayelsa States are shown in **Figures 7 and 8**.

The findings indicate that the majority of women had attained at least a secondary school education, accounting for **58.5%** of respondents in Akwa Ibom State and **62.0%** in Bayelsa State. Women with tertiary education constituted **6.8%** and **8.2%** of respondents in Akwa Ibom and Bayelsa States, respectively, whereas only **4.0%** and **6.4%** had never attended formal school. The relatively high level of formal education among women provides a favourable opportunity for implementing effective maternal and child nutrition education programmes

Table 10: Educational Status of Women (15-49) years in Akwa Ibom and Bayelsa States

Educational Categories	Number of Women		Percentage (%)	
	AKS	BYS	AKS	BYS
Masters	1	1	0.3%	0.3%
OND/HND/BSC	27	32	6.8%	8.2%
Secondary School Certificate	233	243	58.5%	62.0%
Primary School Certificate	115	82	28.9%	20.9%
Did Not Attend Any School	16	25	4.0%	6.4%
Others	6	9	1.5%	2.3%
Grand Total	398	392	100.0%	100.0%

Source: Nutrition-Related KAP Survey Report (April, 2022)

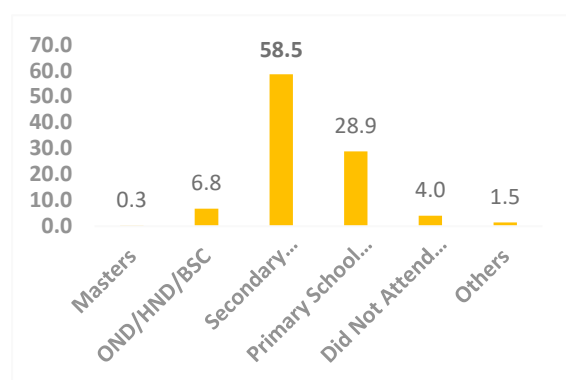


Fig. 7: Educational Level of (15-49) years & PLW Women in Akwa Ibom State

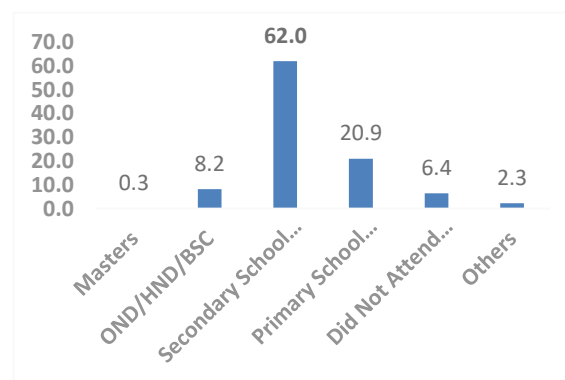


Fig. 8: Educational Level of (15-49) Women in Bayelsa State



3.8 Maternal Nutritional Status Based on Mid-Upper Arm Circumference (MUAC)

Maternal malnutrition remains an important public health concern because it increases the risk of adverse pregnancy outcomes, including low birth weight, preterm delivery, obstructed labour, postpartum haemorrhage, and maternal mortality. Nutritional status was assessed using the World Health Organization recommended MUAC classification for women of reproductive age, where MUAC <190 mm indicates acute malnutrition, 190–230 mm indicates risk of malnutrition, and >230 mm indicates normal nutritional status.

The nutritional status of women in the two study states is summarized in Table 11. Acute malnutrition was observed among 0.5% of women in Akwa Ibom State and 2.0% in Bayelsa State. In addition, 11.8% and 12.2% of women in Akwa Ibom and Bayelsa States,

respectively, were classified as being at risk of malnutrition, while more than 90% of respondents in both states had normal nutritional status. The relatively higher prevalence of acute malnutrition in Bayelsa State underscores the need for strengthened maternal nutrition programmes and continuous nutritional surveillance.

3.9 Nutritional Status of Pregnant and Lactating Women

Pregnant and lactating women are nutritionally vulnerable because of their increased physiological demands. Assessment of their nutritional status is therefore essential for identifying women who may require nutritional support during pregnancy and lactation.

The physiological nutritional status of pregnant and lactating women is presented in Table 12

Table 11: Maternal Nutritional Status(15-49) Years old Women's (MUAC)

Malnourished Women (MUAC <190mm)		Women at Risk (MUAC >=190 - <=230)		Normal Women (MUAC >=230)	
AKS	BYS	AKS	BYS	AKS	BYS
n = (2)	n = (8)	n = (47)	n = (48)	n = (367)	n = (360)
0.5%	2.0%	11.8%	12.2%	92.2%	91.8%
(0.2 - 0.8)	(1.7 - 2.4)	(8.8 - 14.8)	(9.1 - 15.2)	(89.2 - 95.2)	(88.9 -
95% CI	95% CI	95% CI	95% CI	95% CI	94.8) 95% CI

Source: Nutrition-Related KAP Survey Report (April, 2022)

Table 12: Physiological Status of PLW (15-49) years

Pregnant and at Risk of malnutrition (MUAC >=190 - <=230)		Lactating and at Risk of malnutrition (MUAC >=190 - <=230)		Pregnant & Lactating and at Risk of malnutrition (MUAC >=190 - <=230)	
AKS	BYS	AKS	BYS	AKS	BYS
n =(8)	n =(4)	n =(16)	n =(27)	n =(4)	n =(0)
20.5%	5.6%	10.6%	15.3%	30.8%	0.0%
(17.2-23.8)	(4.7-6.4)	(8.9-12.3)	(10.8-19.8)	(28.9-32.7)	(0.0-0.0)
95% CI	95% CI	95% CI	95% CI	95% CI	95% CI



The results show that 20.5% of pregnant women in Akwa Ibom State and 5.6% in Bayelsa State were at risk of malnutrition. Similarly, 10.6% of lactating women in Akwa Ibom State and 15.3% in Bayelsa State were classified as being at risk of malnutrition. Furthermore, 30.8% of women who were both pregnant and lactating in Akwa Ibom State were identified as being at nutritional risk, whereas no such cases were recorded in Bayelsa State during the survey. These findings emphasize the need for sustained maternal nutrition interventions, particularly among pregnant and lactating women, to improve maternal health and birth outcomes.

4. 0 Conclusion

This study assessed Infant and Young Child Feeding (IYCF) practices and the nutritional status of women of reproductive age in selected locations in Akwa Ibom and Bayelsa States, Nigeria. The findings indicate moderate progress in several IYCF indicators compared with the 2018 National Nutrition and Health Survey (NNHS), although important gaps remain that require sustained intervention.

Early initiation of breastfeeding improved in both states, with 55.6% of infants in Akwa Ibom and 53.6% in Bayelsa being breastfed within one hour of birth. However, exclusive breastfeeding among infants younger than six months remained suboptimal, particularly in Akwa Ibom (33.4%), while Bayelsa recorded a modestly higher prevalence (46.4%). These findings indicate that many infants are still introduced to foods or liquids before the recommended age of six months, thereby limiting the protective benefits of exclusive breastfeeding.

Complementary feeding practices were generally encouraging, with 92.3% of infants in Akwa Ibom and 83.2% in Bayelsa receiving soft, semi-solid, or solid foods at the recommended age. Nevertheless, the quality of complementary feeding remains a concern.

Only 52.6% of children aged 6–23.9 months in Akwa Ibom and 22.1% in Bayelsa achieved the minimum dietary diversity, while a substantial proportion of children consumed foods from fewer than the recommended number of food groups. Similarly, fewer than half of the children met the minimum meal frequency requirement, indicating that both dietary diversity and feeding frequency remain inadequate, particularly in Bayelsa State. Although the prevalence of children receiving a minimum acceptable diet was relatively high in Akwa Ibom (72.9%), it remained considerably lower in Bayelsa (48.5%), underscoring persistent nutritional inequalities between the two states.

The assessment of women of reproductive age revealed that the majority had attained at least secondary education, providing a strong platform for nutrition education and behaviour-change interventions. While the prevalence of acute malnutrition among women was generally low, over one in ten women in both states were at risk of malnutrition based on Mid-Upper Arm Circumference (MUAC). The 2.0% prevalence of acute malnutrition observed among women in Bayelsa State warrants particular attention. Furthermore, a considerable proportion of pregnant and lactating women were identified as being at nutritional risk, especially pregnant women in Akwa Ibom and lactating women in Bayelsa, highlighting the need for strengthened maternal nutrition programmes.

Overall, the study demonstrates that although progress has been achieved in breastfeeding initiation and complementary feeding practices, significant deficiencies persist in exclusive breastfeeding, dietary diversity, meal frequency, and maternal nutritional status. These findings emphasize the need for intensified nutrition education, community-based behaviour change communication, routine growth monitoring, improved access to



diverse and nutritious foods, and strengthened maternal and child nutrition services. Targeted interventions should particularly focus on improving exclusive breastfeeding practices, complementary feeding quality, and maternal nutrition, especially among pregnant and lactating women, to accelerate progress towards achieving national nutrition targets and the Sustainable Development Goals related to maternal and child health.

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Anthony Ekpo conceived and designed the study, supervised the data collection, performed the statistical analyses, interpreted the results, and drafted the manuscript. Blessing Iveren Yaweh contributed to data management, literature review, interpretation of findings, manuscript preparation, and critical revision of the manuscript. Both authors read and approved the final version of the manuscript.

