The Federal Republic of Nigeria

National Food Consumption and Micronutrient Survey 2021

Key Findings

January 2024

Published by the International Institute of Tropical Agriculture (IITA) Ibadan, Nigeria

The International Institute of Tropical Agriculture (IITA) is a not-for-profit institution that generates agricultural innovations to meet Africa's most pressing challenges of hunger, malnutrition, poverty, and natural resource degradation. Working with various partners across sub-Saharan Africa, we improve livelihoods, enhance food and nutrition security, increase employment, and preserve natural resource integrity. IITA is a member of CGIAR, a global agriculture research partnership for a food secure future.

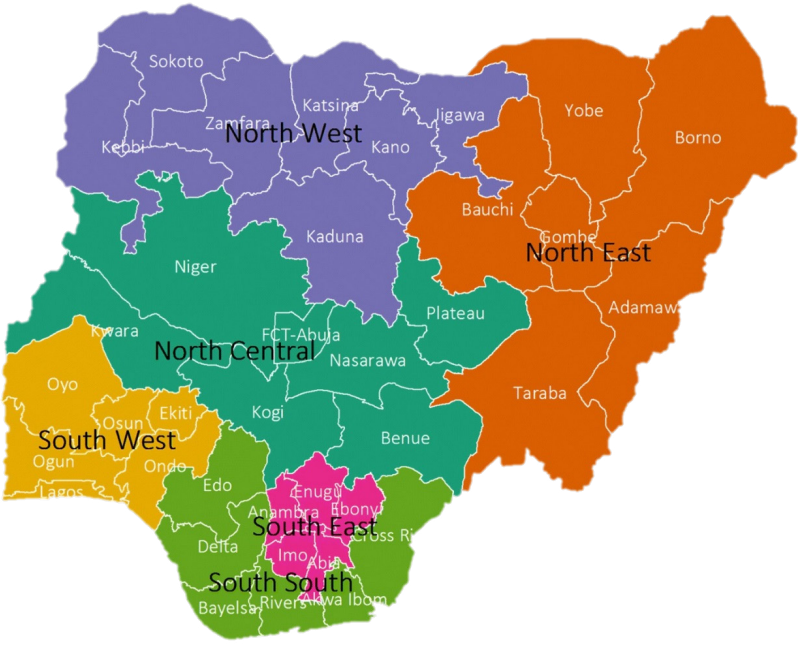
International address:
IITA, Grosvenor House 125 High Street Croydon CR0 9XP, UK

Headquarters:
PMB 5320, Oyo Road Ibadan, Oyo State

ISBN 978-978-131-424-7

Recommended citation: Federal Government of Nigeria (FGoN) and the International Institute of Tropical Agriculture (IITA). 2024. National Food Consumption and Micronutrient Survey 2021. Key Findings. Abuja and Ibadan, Nigeria: FGoN and IITA. 73 pp.

Printed in Nigeria by IITA



Federal Ministry of Health and Social Welfare

Federal Ministry of Agriculture and Food Security

Federal Ministry of Budget, and Economic Planning

International Institute of Tropical Agriculture

January 2024

Contents

Key Messages

- The results show a low coverage of key nutrition interventions. To improve overall nutritional status and maternal and child health, key nutrition interventions and services need to be better implemented across populations. A better understanding of implementation science is needed to address implementation bottlenecks to improve programme coverage, quality, and impact of nutrition interventions.
- Dietary diversity is still too low to ensure an adequate supply of micronutrients in women. Innovations in the food system are needed to incentivize the production and consumption of nutrient-rich foods in addition to the familiar staples.
- The contribution of animal protein is low and at least >30% of women have not met protein intake requirements. The overall diet (of women and children) is likely to be deficient in essential amino acids, which are important for growth and development. Innovations in the food system are needed to incentivize the production and consumption of more foods with animal protein.
- Dietary micronutrient deficiencies remain a problem and are even more serious in women (especially pregnant and breastfeeding women). Food and nutritional policies such as supplementation and fortification, which have been shown to improve micronutrient intake, need to be expanded and maintained.
- Staple foods that could provide more nutrients for total nutrient intake are less utilized than foods that serve as ingredients. Strengthen existing policies and create innovative strategies that improve mandatory food fortification at scale, especially for staple foods.
- Iron deficiency, inflammation and malaria are associated with an increased likelihood of anaemia in all age groups, while vitamin A deficiency plays an important role in pregnant women and women of reproductive age, and zinc deficiency is a determinant of anaemia in WRA and preschool children. Although these findings provide important insights, further analysis is needed to understand the magnitude of the relative contribution of each risk factor to better inform the design of anaemia control.
- The results provide the government and stakeholders with evidence of nutrition vulnerability to prioritise. This provides an opportunity to start the conversation about how to invest in agriculture, nutrition and food systems and who to target. It also provides opportunities for the formulation of evidence-based policies and programmes and a baseline from which to monitor change over time.

National Food Consumption and Micronutrient Survey (NFCMS) 2021 Key Findings

The National Food Consumption and Micronutrient Survey (NFCMS) is a cross-sectional population-based survey. The primary objective of the survey is to assess the micronutrient status, anthropometry, and dietary intake of women of reproductive age (WRA), aged 15-49 years, including pregnant and lactating women, and children (aged 6-59 months) as well as the micronutrient status of non-pregnant adolescent girls (aged 10-14 years) and identify key factors associated with poor nutrition in these populations. The information generated will provide a foundation for the formulation of evidence-informed policies and programmes. In the short- to medium-term, the information will provide a baseline from which to monitor changes over time.

Objectives

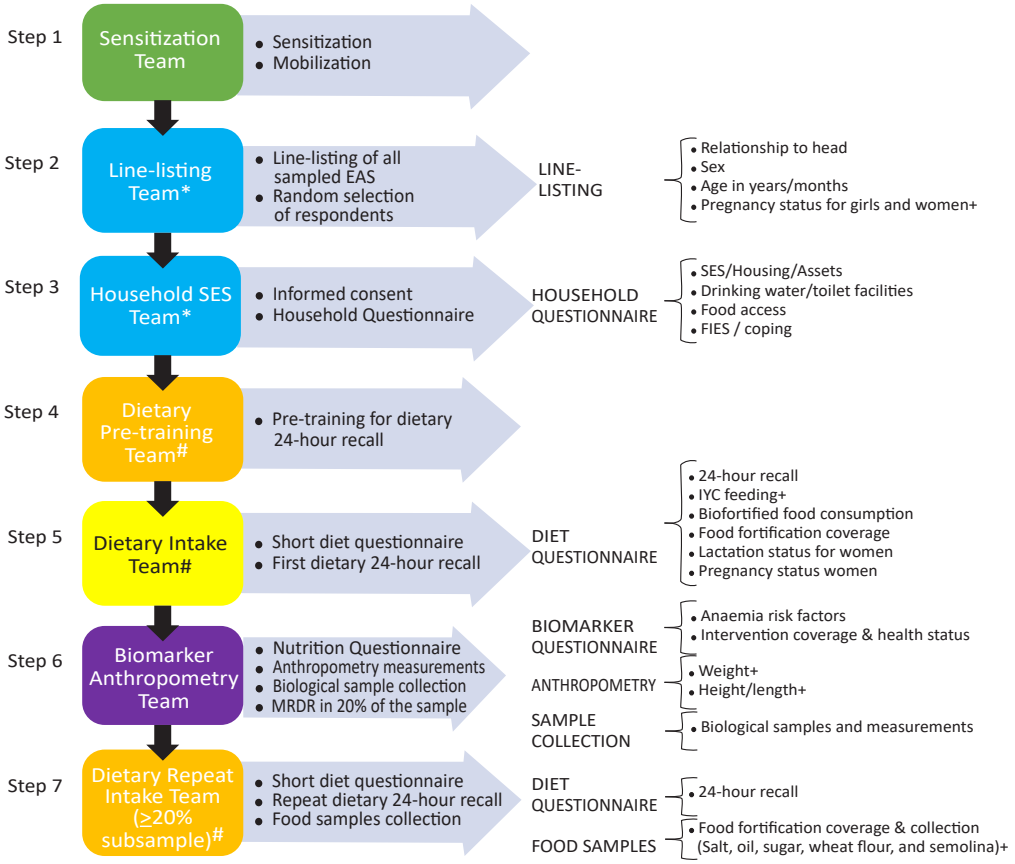
The primary objective of the survey is to assess the micronutrient status and dietary intake of women of reproductive age (WRA) (aged15-49 years), including pregnant and lactating women and children (aged 6-59 months). The study also assessed the micronutrient status of non- pregnant adolescent girls (aged 10-14 years) and identified key factors associated with poor nutrition in these populations. The information generated will provide a foundation for the formulation of evidence-informed policies and programmes. In the short- to medium term, the information will provide a baseline from which to monitor changes over time.

The specific objectives of the survey include:

1. assess the food consumption of children (aged 6-59 months), excluding breastmilk, and WRA to determine their intakes of energy, protein, fat, and selected micronutrients, as well as the amounts of specific nutrient-dense foods relevant for food-related nutrition policies and programmes
2. determine the adequacy of nutrient intake in children (aged 24-59 months) and WRA to identify populations at risk of inadequate intake
3. assess infant and young child feeding (IYCF) practices among children (aged 6-23 months) and compare the nutrient density of their complementary feeding diets with recommendations
4. assess the prevalence, severity, and distribution of specific micronutrient deficiencies and other forms of malnutrition (e.g. stunting, wasting, overweight/obesity) among WRA, adolescent girls, and children (aged 6-59 months)
5. identify key factors (e.g. infection, blood disorders, supplement use) associated with anaemia in WRA and children (aged 6-59 months) to inform strategies to prevent and treat anaemia in these populations
6. measure the coverage of national interventions to improve micronutrient status and dietary intake in WRA and children (aged 6–59 months), including iron folic acid (IFA) supplements, IYCF counselling, vitamin A supplementation (VAS), biofortification, and food fortification programmes

7. assess the prevalence of food insecurity and identify other key factors at individual and HH levels (e.g., education, SES) that are associated with micronutrient status and dietary intake in WRA and children (aged 6–59 months), and the micronutrient status in adolescent girls.

The NFCMS 2021 collected information on four distinct components: (1) socioeconomic and demographic information of household in sample; (2) dietary intake – types and amounts of foods consumed in the last 24 hours; (3) anthropometry – height/length, weight, age; and (4) micronutrient status through a series of biomarkers analyses of the biological samples were carried out in both local and international laboratories that adopted rigorous quality control measures. The order of field operations, and information collected by each component during data collection is presented below.



* The line-listing and household SES teams are the same interviewers.
# The dietary pre-training and dietary repeat intake teams are the same interviewers.
+ Only collected for relevant respondents.

Survey components, order of field operations, and information collected by each component

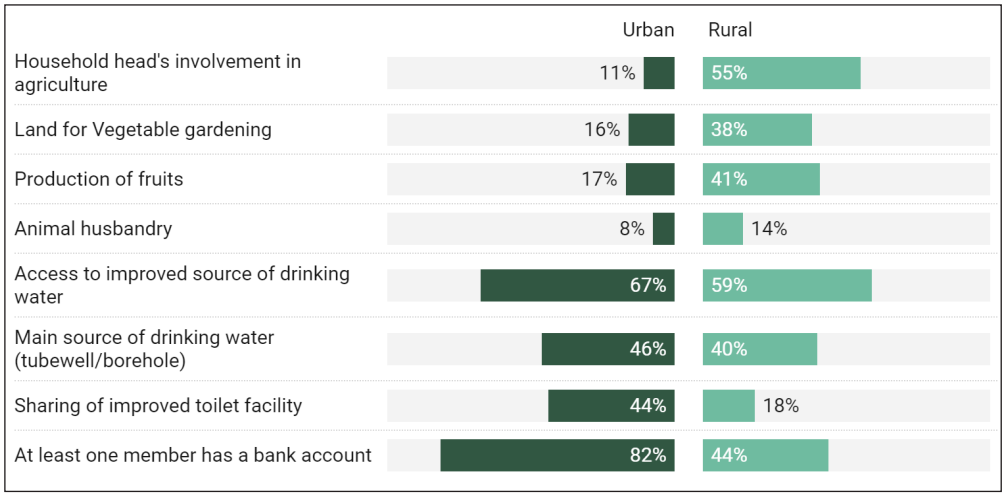
This report presents key findings from the NFCMS 2021. The reporting domains and level of disaggregation are presented in Table 2. For dietary intake, the results are

presented separately for children aged 6-23 versus 24-59 months at the national level and by location (urban and rural). For WRA, including pregnant women, data was disaggregated by geopolitical zone and by location (urban and rural) at the national level. In addition, lactating women, with higher energy and nutrient requirements are presented separately. For biomarker and anthropometry, results are presented at the national level, geopolitical zone, and by location (urban and rural) for WRA and children (aged 6-59 months); and at national level and by location (urban and rural) for pregnant women (15-49 years old) and non-pregnant adolescent girls (10-14 years old).

Reporting domain by target groups and survey components

	Sampling target groups			
	Non-pregnant WRA (aged15-49 Years)	Children (aged 6-59 months) *	Pregnant women (aged 15-49 years)	Non-pregnant adolescent girls (aged 10-14 years)
Reporting domain for dietary intake	National & geopolitical region	National	National	No data collected
Reporting domain for micronutrient biomarker/ anthropometry	National & geopolitical region	National & geopolitical region	National	National
Outcomes disaggregated by urban and rural areas	National	National	National	National

Household in-sample key findings



Income-generating activities of household heads: Overall, 36.8 percent were involved in agriculture (54.8 percent rural and 10.7 percent urban).

Production of animal source foods: 11 percent of households were engaged in the production of animal source foods, very low between rural (13.9 percent) and urban areas (7.5 percent).

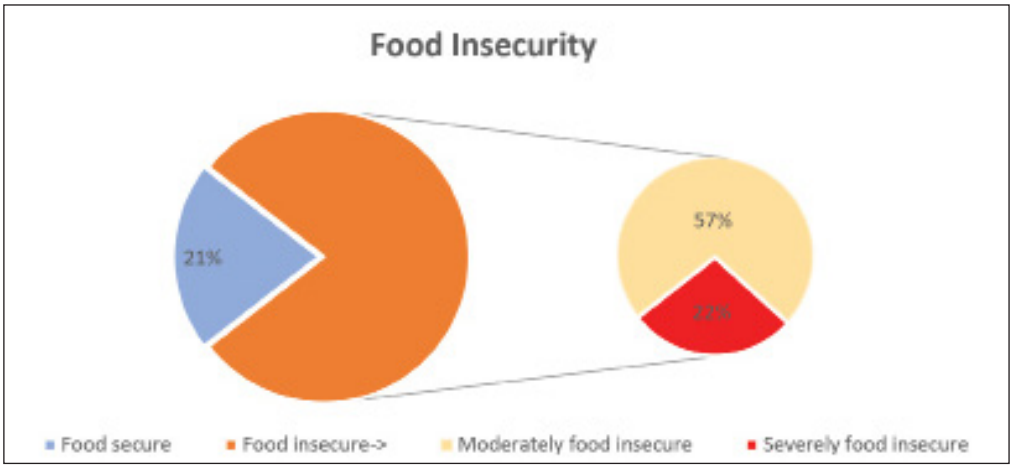
Land for vegetable gardening: Overall, 3 out of 10 households indicated that they have land for vegetable gardening. The proportion was higher in rural areas (38 percent) compared to urban areas (16 percent).

Production of fruits: Overall, 31 percent of households in the sample have trees or bushes that produce fruits and were more in the South East (56 percent) followed by South South (44 percent), and North Central (39 percent).

Drinking water: Overall, 62 percent of households have access to an improved source of drinking water (67.4 percent in urban and 58.7 percent in rural).

Availability of water: The most common main source of drinking water is the tubewell/ borehole (42.6 percent of households) and prevalent in urban (46.3 percent) than rural (39.9 percent).

Sanitation: 55 percent of households used an improved toilet facility (26.5 percent not shared and 28.5 percent shared with at least one other household). Sharing of improved toilets was higher in the urban areas (44 percent) than in the rural areas (18 percent).



Resources to purchase food: Overall 41.5 percent of households did not have enough food or money to buy food in the past seven days before the survey.

Coping strategies: Reliance on less preferred and less expensive foods; food borrowing or relying on help from friends or relatives; limiting portion size at mealtimes; restriction on consumption by adult members of the household; and reduction in the number of meals eaten in a day were used.

Financial inclusion: Overall, 59 percent of households had at least one member with an account with a bank or other financial institution (81.5 percent in urban and 43.6 percent in rural.

Key Findings for Dietary Intake

Key Findings: Characteristics of respondents

***Age of women of reproductive age**:* Over half of the women (57 percent of non-pregnant and 82 percent of pregnant women) were between 20 and 39 years old.

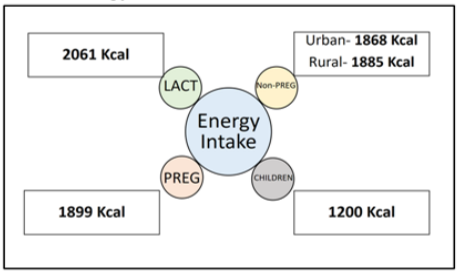
Level of education: 44.6 percent of non-pregnant women, 35.2 percent of pregnant women, and only 7.7 percent of caregivers had completed senior secondary school.

Pregnancy status: Nationally, about 26 percent of the sampled pregnant women were in the first trimester of pregnancy, 19 percent were in the second trimester, and 25 percent were in the third trimester.

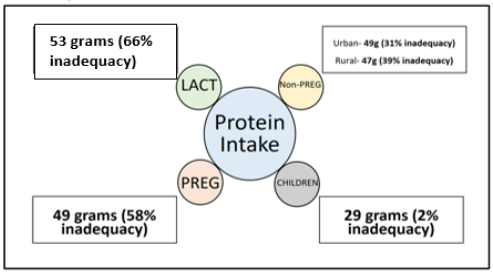
Lactation status: Nationally, about 24 percent of non-pregnant women reported breastfeeding a child of any age (29 percent from rural areas and 18 percent from urban areas).

Key findings on macronutrient intakes for women and children

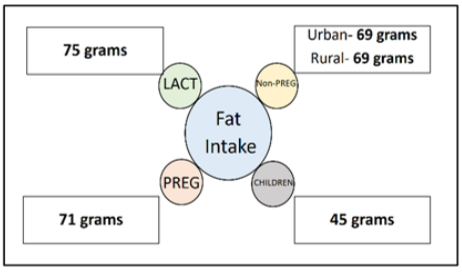
Usual energy intake of women and children



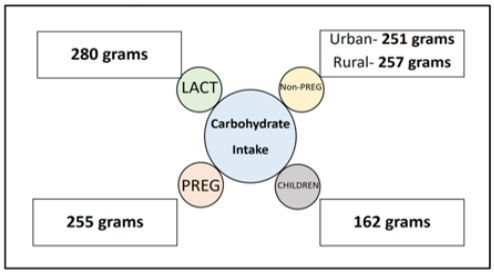
Usual protein intake of women and children



Usual fat intake of women and children



Usual carbohydrate intake of women and children



Usual mean energy intake for women of reproductive age: Nationally, the usual mean energy intake was 1848 kcal for non-pregnant non-lactating women, 2061 kcal for lactating women, and 1899 kcal for pregnant women (1652 kcal in North Central and 2040 kcal in South East).

Usual mean energy intake for children 24-59 months: Nationally, the **u**sual mean energy intake for children aged 24-59 months was 1200 kcal (1235 kcal for boys and 1163 kcal for girls).

Food sources contributing to energy intake: Refined palm oil (palm olein), rice, and red palm oil were the main contributors to energy intake for both women and children nationally (palm olein, maize flour, and rice main contributors in the Northern zones; rice, palm oil, garri, palm olein, and bread in the Southern zones.

Usual mean protein intakes for women of reproductive age: Nationally, non-pregnant non-lactating women and lactating women had intakes of 47 grams and 53 grams, respectively while pregnant women had a usual intake of 49 grams (North Central and North East had an intake of 42 grams and South West had an intake of 53 grams).

Protein inadequacy in women of reproductive age: About 35 percent of non-pregnant women have an inadequate protein intake, 58 percent of pregnant women, and 66 percent of lactating women have inadequate intake (51 percent urban and 63 percent rural dwellers for pregnant women).

Intake of animal-sourced protein for women of reproductive age: The usual intake of animal-sourced protein among non-pregnant women is 14 grams. Across the zones, it ranged from a low of 8 grams among women living in the North East to a high of 23 grams among South South women.

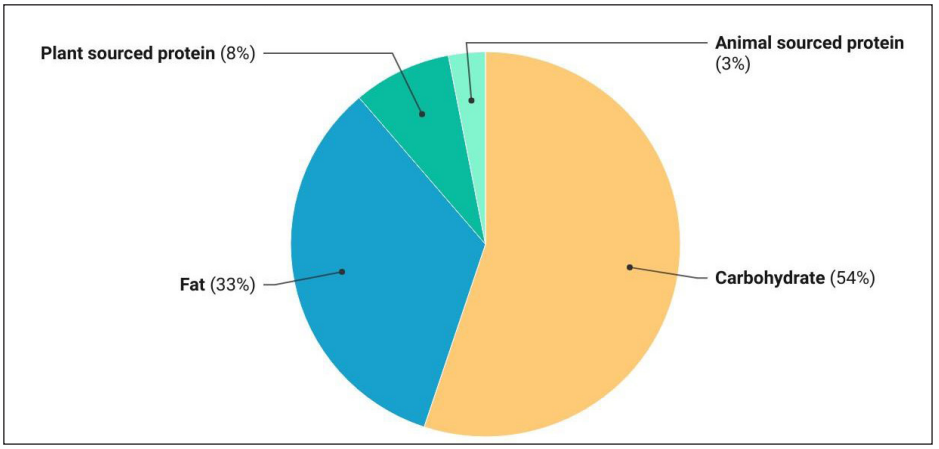
Intake of plant-sourced protein for women of reproductive age: The mean usual intake of protein from plant sources was 35 grams irrespective of pregnancy status while it was different for non-lactating women (34 grams) and lactating women (40 grams). Across the zones, women in the North West had the highest intake of 41 grams, while South South women had the lowest intake of 26 grams.

Usual mean protein intake for children 24-59 months: Nationally, the **u**sual mean protein intake for children aged 24-59 months is 29 grams (30.6 grams in urban and 28 grams in rural). Only 2 percent had inadequate intake.

Food sources contributing to protein intake for women and children 24-59 months: The main food sources for protein were rice, maize products, and cowpea products for both women of childbearing age and children 24-59 months.

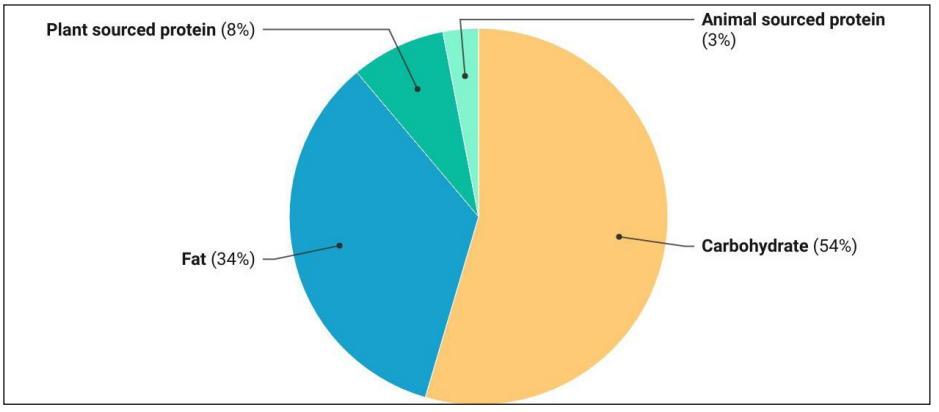
Intake of animal- and plant-sourced protein for children 24-59 months: The usual intake is 7 grams and 22 grams from animal and plant sources respectively.

Contribution of macronutrients to total usual energy intake among non-pregnant women



Contribution of protein to total usual energy intake: The mean contribution of protein to total usual energy intake was approximately 10 percent for women across the various categories and children 24-59 months (Animal sources contributed approximately 3 percent and plant sources generally contributed about 8 percent).

Contribution of macronutrients to total usual energy intake among children aged 24-59 months



Usual intakes of fat: Nationally, the usual fat intake in non-pregnant women is 68.7 grams (North Central 58.4 grams and South East 79.3 grams). The usual fat intake of pregnant women living in rural areas was 67.4 grams and those in urban areas had an intake of 76.8 grams. The mean fat intake of children aged 24 –59 months is 45 grams.

Food Sources contributing to fat intake: Among women and children, the main sources of fat were edible oils (palm oil, its products, and other vegetable oils).

Percentage contribution of fat to total energy intake: The contribution of fat intake to overall energy intake was approximately 33 percent and 34 percent for women and children respectively.

Usual intake of Carbohydrates in women: Usual mean carbohydrate intakes were 251 grams for non-pregnant non-lactating women, 280 grams for lactating women, and 255 grams for pregnant women (229 grams in the North Central and 274 grams in North West).

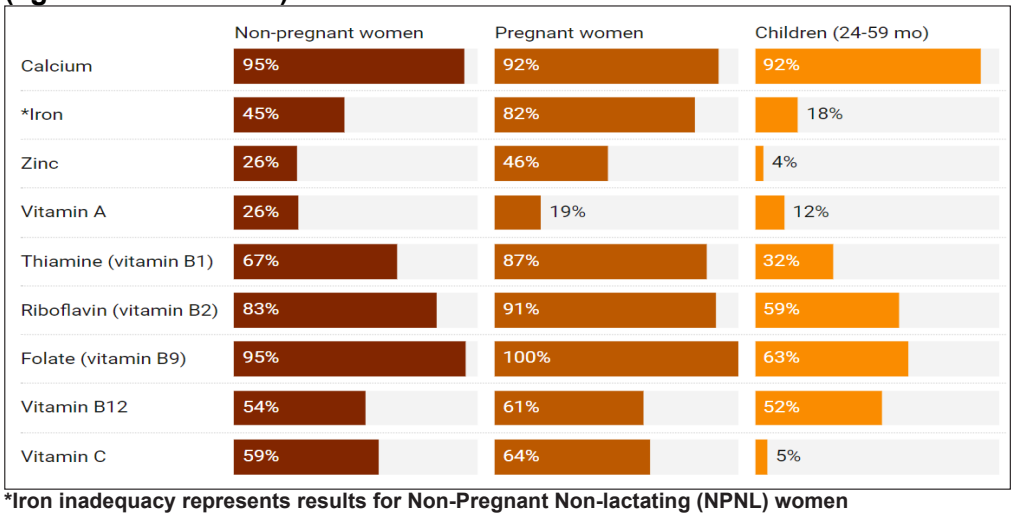
Usual intake of Carbohydrates in children 24-59 months: The usual carbohydrate intake is 162 grams (170 grams in urban and 158 grams in rural areas).

Food sources contributing to carbohydrate intake: Rice, maize, and cassava (garri) products were the major food sources across all groups of women and children 23-59 months. In the case of children, sugar was a higher contributor than bread when compared to women.

Percentage contribution of carbohydrate to total energy intake: The mean contribution of carbohydrate intake to overall energy intake was approximately 54 percent across the sampled categories of women (also 54 percent for children 24-59 months).

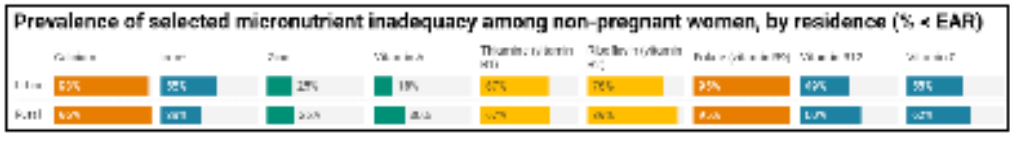
Key findings on micronutrient intakes for women and children

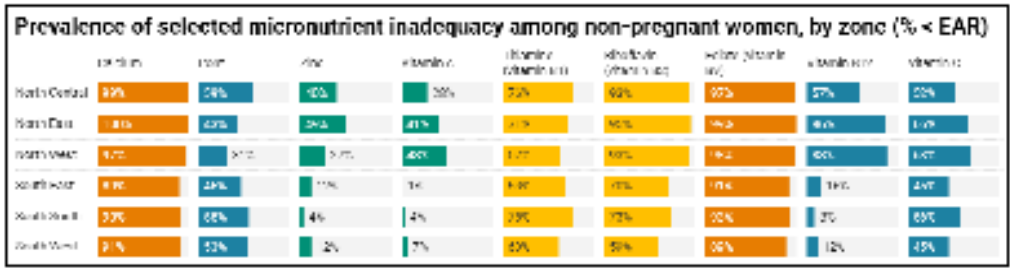
Prevalence of micronutrient inadequacy among women and children (aged 24-59 months)

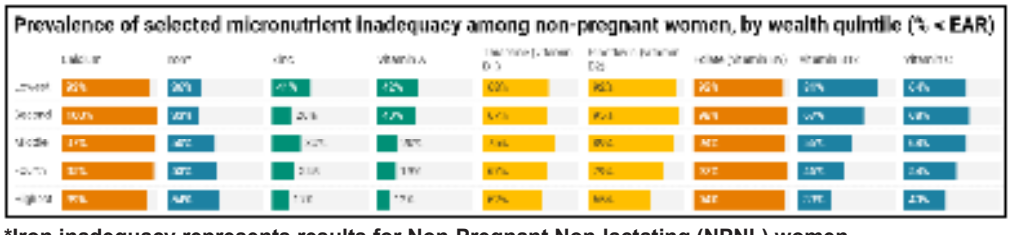


*Iron inadequacy represents results for Non-Pregnant Non-lactating (NPNL) women

Nutrient intake inadequacy (%) among non-pregnant WRA by residence, zone and wealth quintile







*Iron inadequacy represents results for Non-Pregnant Non-lactating (NPNL) women

Calcium

Usual mean calcium intake in women: 466 mg for non-pregnant non-lactating women, 502 mg for lactating women, and 490 mg for pregnant women (pregnant women in urban areas 534 mg and 465 mg in rural areas; non-pregnant women 351 mg in North East and 591 mg in South East).

Calcium inadequacy in women: 90 percent for lactating women and 95 percent for non-pregnant non-lactating women (89 percent for South East and 100 percent in North East).

Food sources contributing to calcium intake for women and children 24-59 months: The main calcium contributors are bread, shellfish, fura da nono, baobab powder, and soybean.

Usual mean calcium intake in children 24-59 months: The usual calcium intake of children aged 24-59 months was 305 mg.

Calcium inadequacy in children 24-59 months: Nationally, 92 percent of children 24-59 months had inadequate intake of calcium (88 percent urban and 94 percent rural).

Iron

Usual mean iron intakes in women: 16.1 mg for non-pregnant non-lactating women and 18.9 mg among lactating women and 17.2 mg among pregnant women nationally (17.5 mg in rural areas and 14.3 mg in urban for non-pregnant non-lactating women; 13.7 mg in North Central and 19.1 mg in North West).

Iron inadequacy in women: 45 percent of non-pregnant non-lactating women, 82 percent of pregnant women, and 16 percent of lactating women had inadequate iron intake (59 percent in North Central and 31 percent in North West; 36 percent in the lowest wealth quintile and high 54 percent in the highest wealth quintile).

Food sources contributing to iron intake for women and children 24-59 months: Condiments (mainly locust beans and seasonings used in preparing soups and sauces), pepper, millet, maize, and rice products. Non-heme iron is the major form in the diet. In all the zones.

Usual mean iron intake in children 24-59 months: The usual iron intake of children aged 24-59 months is 10.7 mg (9.9 mg in urban and 11.1 mg in rural).

Iron inadequacy in children 24-59 months: 18 percent nationally (16 percent rural and 22 percent in urban; 15 percent in males and 20.7 in females).

Zinc

Usual mean zinc intakes in women: the mean usual zinc intake of non-pregnant-non-lactating is 8.5 mg, lactating is 9.4 mg, and pregnant women is 8.8 mg (6.7 mg in North East and 10.9 mg in South South).

Zinc inadequacy in women: 46 percent of pregnant women and 26 percent of non-pregnant women had inadequate zinc intake (49 percent in North East and 4 percent in South South for non-pregnant women; 51 percent in rural and 40 percent in urban for pregnant women).

Food sources contributing to zinc intake for women and children 24-59 months: The main contributors to nutrient intake of zinc among women and children were *garri*, rice, maize products, and beef. Products from cowpea, millet, and sorghum were also among the foods that were commonly consumed by women and children.

Usual mean zinc intake in children 24-59 months: Nationally, the usual zinc intake of children aged 24-59 months is 5.0 mg.

Zinc inadequacy in children 24-59 months: Inadequate zinc intake is 3.5 percent nationally (4.4 percent rural and 1.9 percent urban).

Vitamin A

Usual mean vitamin A intake in women: 924 mg for non-pregnant non-lactating women, 966 mcg for lactating women, and 972 mcg for pregnant women (1567 mcg in South and 629 mcg in North West).

Vitamin A inadequacy in women: 26 percent of non-pregnant and 58 percent of lactating women had an inadequate intake (48.3 percent in North West and 1.3 percent in South East.

Food sources contributing to vitamin A intake for women and children 24-59 months: The main food sources of vitamin A are palm oil, banga (palm nut soup), palm olein (a refined version of palm oil fortified with vitamin A). Mango fruit with some leafy and non-leafy vegetables were also notable foods that contributed to vitamin A intake.

Usual mean vitamin A intake in children 24-59 months: The usual vitamin A intake of children aged 24-59 months is 575 mcg.

Vitamin A inadequacy in children 24-59 months: 12.4 percent had inadequate intake of vitamin A (17.8 percent rural and 0.8 percent in urban).

Vitamin C

Usual mean vitamin C intakes in women: 61 mg for non-pregnant and 64 mg for pregnant women. Mean intake of pregnant women living in urban areas is 72 mg and 60 mg in rural areas.

Vitamin C inadequacy in women: 53 percent among non-lactating women to a high of 87 percent among lactating women (44.7 percent in South East and 67.9 percent in North West).

Food sources contributing to vitamin C intake for women and children 24-59 months: The main contributors among women and children were pepper, tomato, onion, mango fruit, cocoa drink, and tubers like sweet potato and white yam.

Usual mean vitamin C intake in children 24-59 months: Mean intake of 41 mg (38 mg in rural and 47 mg in urban areas.

Vitamin C inadequacy in children 24-59 months: Low prevalence of inadequacy, less than a tenth (5 percent) of all children.

Vitamin B1 (Thiamine)

Usual mean vitamin B1 intakes in women: U\usual mean thiamine intake of women was similar (0.8-1.0 mg) irrespective of residence, zone, and wealth quintile.

Vitamin B1 inadequacy in women: Nationally, about 65 percent of non-lactating women and 67 percent of non-pregnant women have a risk of inadequate thiamine intake which increased if the woman was lactating (77.3 percent) or pregnant (86.9 percent).

Food sources contributing to vitamin B1 intake for women and children 24-59 months: The main foods that contributed to the overall thiamine intake of women and children were bread, products from maize, rice, and millet. Noodles and sorghum products contributed across all age groups.

Usual mean vitamin B1 intake in children 24-59 months: The usual intake of vitamin B1 is 0.5 mg with no substantial difference across the sex and residence of the children.

Vitamin B1 inadequacy in children 24-59 months: 32 percent of children have an inadequate intake when compared with recommendations.

Vitamin B2 (Riboflavin)

Usual mean vitamin B2 intakes in women: Riboflavin intake of women across all categories was a mean of 0.7 mg. This level of intake was consistently similar when intake was disaggregated across residence, zone, and wealth quintiles and only reached a high of 0.9 mg among women in the highest wealth quintile.

Vitamin B2 inadequacy in women: Intake was generally inadequate in at 80 percent of the women (94.8 percent in North-East and 59.3 percent in South-West).

Food sources contributing to vitamin B2 intake for women and children 24-59 months: rice, bread, pepper, catfish, cocoa, and fura da nono were the main contributors to vitamin B2 intake. Among children, cocoa drinks had a higher contribution to riboflavin intake compared to women.

Usual mean vitamin B2 intake in children 24-59 months: The usual mean intake was 0.4 mg.

Vitamin B2 inadequacy in children 24-59 months: 59 percent of all children had an inadequate vitamin B2 intake (70 percent among rural and 39 percent in urban areas).

Vitamin B9 (Folate)

Usual mean vitamin B2 intakes in women: The mean usual folate intake of non-pregnant women is 200 mcg; 197 mcg for non-lactating women, and 217 mcg for lactating women (189 mcg for women in the lowest quintile and 208 mcg for women in the highest quintiles).

Vitamin B9 inadequacy in women: Inadequacy of vitamin B9 intake was greater than 90 percent across all categories of women with the highest prevalence of inadequacy among pregnant women is 99.9 percent (88.8 percent in South West and 99.4 percent in North East).

Food sources contributing to vitamin B9 intake for women and children 24-59 months: The main food sources that contributed to the overall folate intake of women and children are cowpea, maize, and millet products, cassava (*garri*), baobab powder, and rice.

Usual mean vitamin B9 intake in children 24-59 months: 122 mcg nationally, which when disaggregated by residence was 131 mcg among urban dwellers and 116 mcg among rural dwellers.

Vitamin B9 inadequacy in children 24-59 months: 63 percent of children 24-59 months nationally had an inadequate intake of folate (54.4 percent in urban and 67.6 percent in rural areas).

Vitamin B12 (Cobalamin)

Usual mean vitamin B12 intakes in women: Nationally, the mean usual vitamin B12 intake of non-pregnant women is 2.6 mcg (0.9-1.8 mcg in Northern zones and 4.4-5.0 mcg in Southern zones.

Vitamin B12 inadequacy in women: Nationally, 54.2 percent of non-pregnant women have inadequate intake of vitamin B12 (87.9 percent in North West and 8.4 percent in South South).

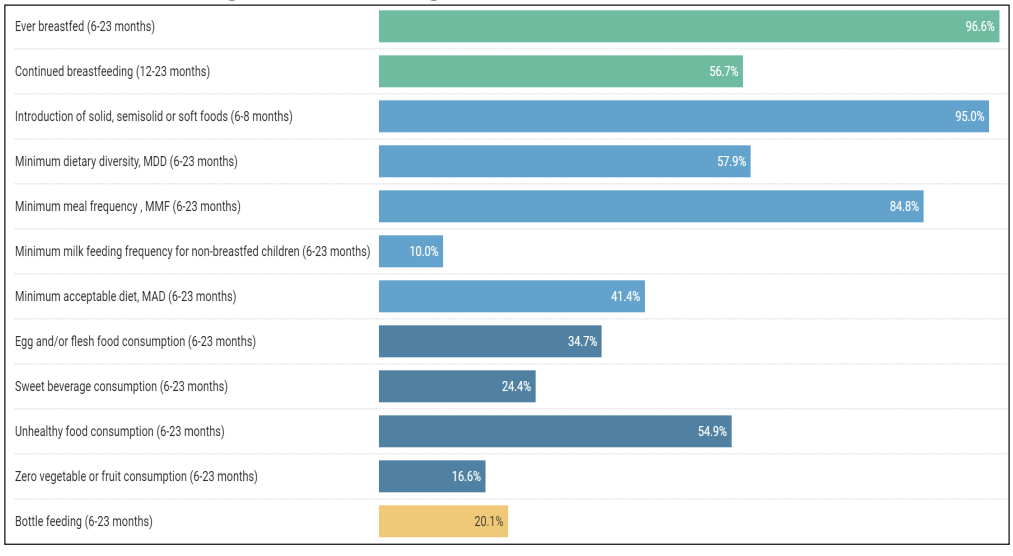
Food sources contributing to vitamin B12 intake for women and children 24-59 months: The main food sources of vitamin B12 for women of reproductive age are fish (mackerel, sardine, catfish, and hake), and beef.

Usual mean vitamin B12 intakes in children 24-59 months: Children aged 24-59 months had a usual intake of 1.4 mcg nationally (1.2 mcg in rural and 2.1 mcg in urban areas).

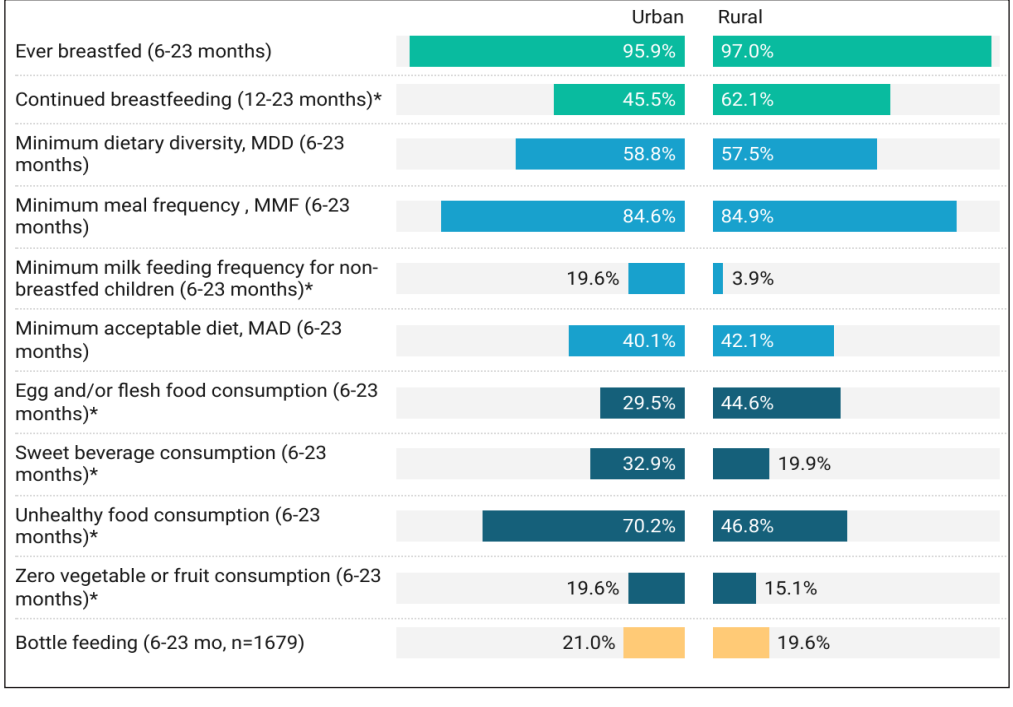
Vitamin B12 inadequacy in children 24-59 months: The inadequacy of vitamin B12 intake was 51.7 percent nationally (60.3 percent in rural and 43.0 percent in urban areas).

Key Findings on Infant and Young Child Feeding

Infant and Young Child Feeding Indicators



Infant and Young Child Feeding Indicators based on residence



Ever Breastfed: Almost all (97 percent) children (aged 6-23 months) were ever breastfed. Similar patterns were observed in urban and rural areas, and for girls and boys.

Continued Breastfeeding: Nationally, 57 percent of children (aged 12-23 months) received continued breastfeeding. It was more common in rural areas (62 percent) than in urban areas (46 percent).

Introduction of Solid, Semi-Solid, or Soft Foods: Most children aged 6-8 months (95 percent) consumed at least one solid, semi-solid, or soft food the previous day.

Minimum Dietary Diversity: More than half (58 percent) of the children aged 6-23 months achieved minimum dietary diversity.

Minimum Meal Frequency: Nationally, 84.8 percent of children aged 6-23 months achieved a minimal meal frequency.

Minimum Acceptable Diet: Nationally, 41.4 percent of children aged 6-23 months consumed a minimum acceptable diet. The proportion of children with a minimum acceptable diet was 42 percent, 53 percent, and 28 percent for children aged 6-11, 12-17, and 18-23 months, respectively.

Minimum milk feeding frequency for non-breastfed children: Only 10 percent received Minimum Milk Feeds which was significantly lower in rural (3.9 percent) compared to urban 19.6 percent). The proportion of children that received the minimum number of milk feeds was 9 percent, 17 percent, and 8 percent for children aged 6-11, 12-17, and 18-23 months, respectively.

Egg and/or flesh food consumption: One-third (35 percent) of children aged 6-23 months consumed egg and/or flesh foods the previous day.

Sweet beverage consumption: Nationally, 24 percent of children aged 6-23 months consumed sweet beverages the previous day (33 percent in urban and 20 percent in areas).

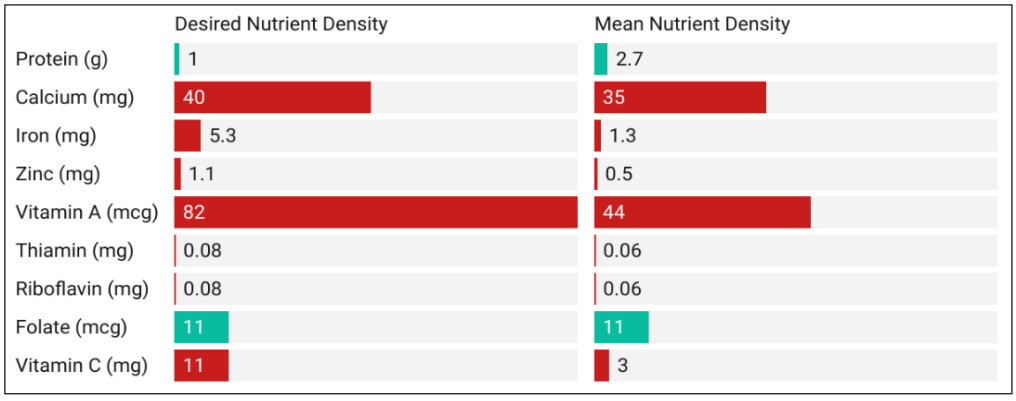
Unhealthy food consumption: Nationally, 55 percent of children aged 6-23 months consumed unhealthy foods the previous day (70 percent in urban and 47 percent in rural areas).

Zero vegetable or fruit consumption: One in six (17 percent) children aged 6-23 months did not consume fruits or vegetables the previous day. No differences were observed by sex or residence.

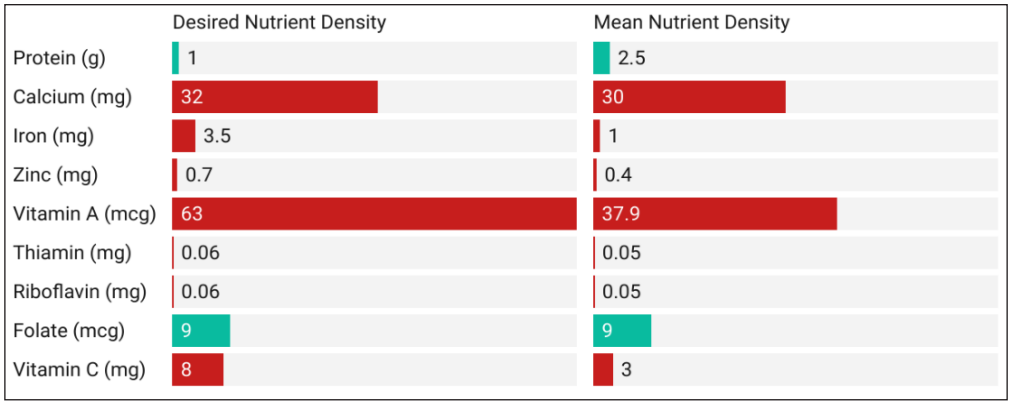
Bottle Feeding: One-fifth of children (20 percent) aged 6-23 months used a feeding bottle with a nipple the previous day. No differences were observed by sex or residence.

Key findings on the nutrient density of the complementary diet of children aged 6-23 months.

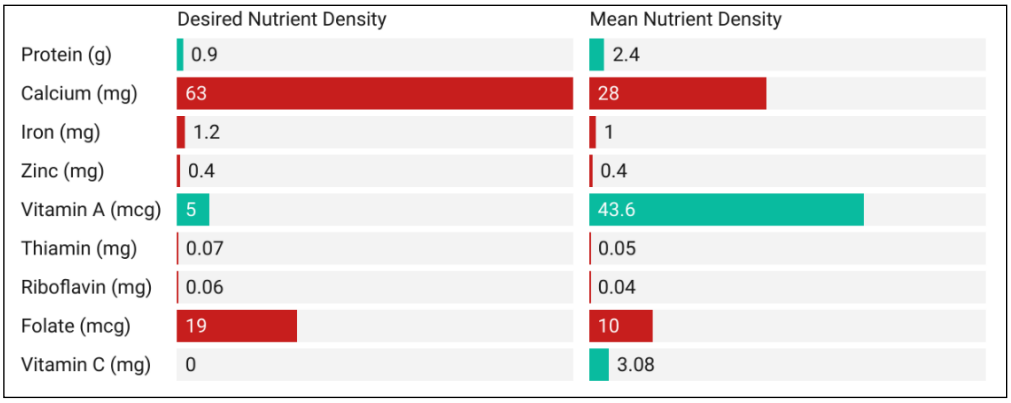
Nutrient density of the complementary diet in infants aged 6-8 months



Nutrient density of the complementary diet in infants aged 9-11 months



Nutrient density of the complementary diet in children aged 12-23 months



Usual energy intake and nutrient density of the complementary diet in infants aged 6-23 months: The mean usual energy intake from the complementary diet was 333 kcal. The usual energy intake was adequate when compared with recommended intakes for this age group.

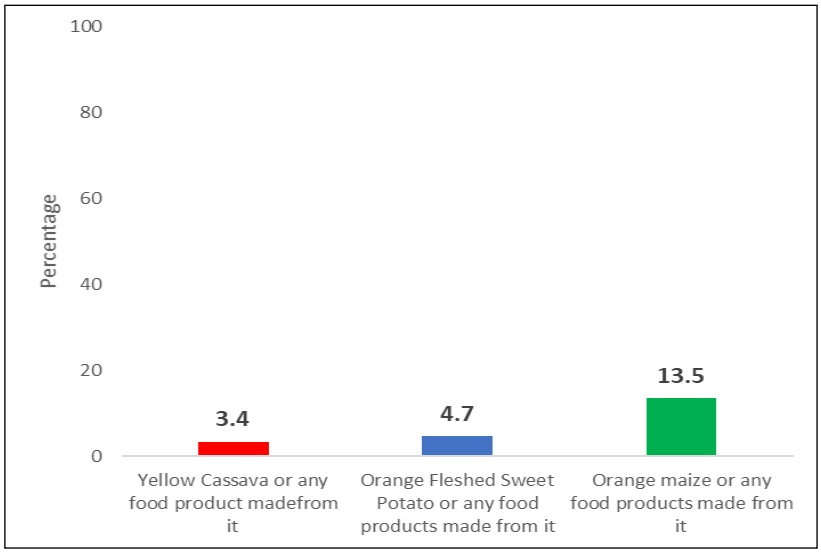
Usual protein intake and nutrient density of the complementary diet in infants aged 6-23 months: The protein density was 2.7g/100kcal. The protein density of the complementary diet of the children aged 6-23 months was also above the respective desired nutrient densities for each age classification.

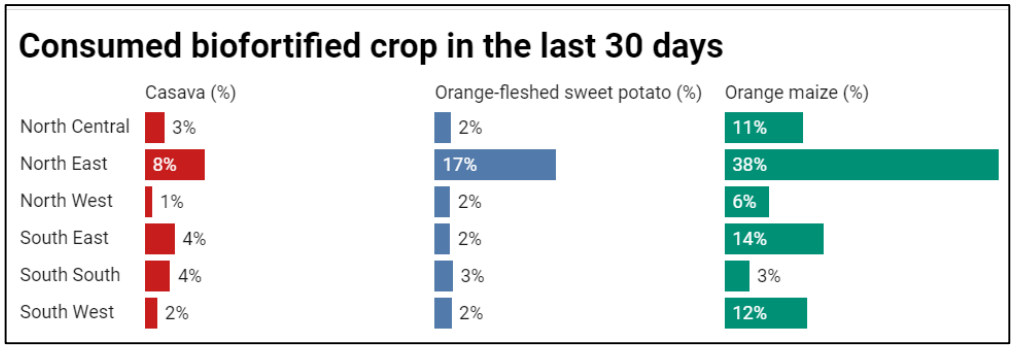
Nutrient densities of minerals and vitamins: The mean densities of calcium, iron, and zinc, vitamins B1, B2, and C in the complementary diet of children aged 6-8 months had mean densities that were below the recommended Desired Nutrient Densities.

Nutrient densities of minerals and vitamins by age group: Children aged 12 –23 months had inadequate densities for calcium and vitamin B9- folate.

Biofortification Coverage

Respondents that consumed selected biofortified foods the previous 30 days





Consumption of biofortified crops: Only 3, 5, and 14 percent of the respondents consumed yellow cassava, orange-fleshed sweet potato, and orange maize, respectively in the last 30 days. The consumption of biofortified foods were notably highest in the North east of the country compared to other zones. About 5% consumed at least more than one biofortified food in the previous 30 days with the highest proportion coming from the North East.

Consumption of yellow cassava: Consumption was 1 percent in the North West and 8 percent in the North East. No differences were observed by residence (i.e., urban vs. rural) and wealth quintile.

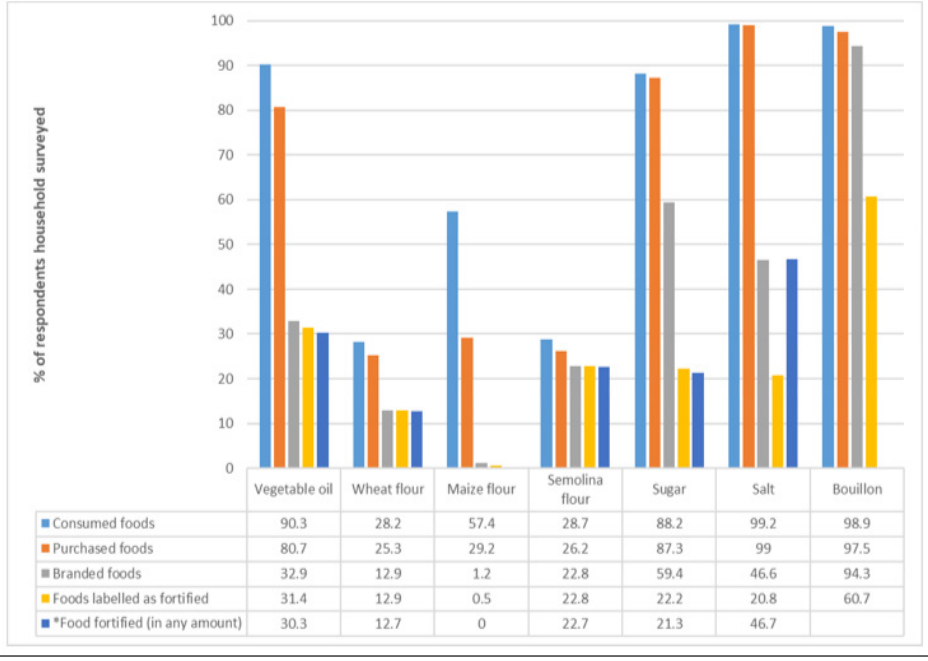
Consumption of orange-fleshed sweet potato: Consumption was 17 percent in the North East and 2 percent in all other zones. No differences were observed by residence and wealth quintile.

Consumption of orange maize: Consumption of orange maize was 38 percent in the North East and between 4 and 14 percent in all other zones. No differences were observed by residence and wealth quintile.

Frequency of consuming biofortified crops: Among the non-pregnant women who reported having consumed biofortified crops, the vast majority reported consuming it on 1 to 9 days in the past 30 days (77, 84, and 56 percent for yellow cassava, orange-fleshed sweet potato, and orange maize respectively), whereas few consumed it daily (2, 0, and 16 percent for yellow cassava, orange-fleshed sweet potato, and orange maize, respectively).

Fortification coverage and intake of Fortifiable food vehicles

Coverage of Selected Food Vehicles among Households of the sampled Non-Pregnant Women at National Level



	Vegetable oil	Wheat flour	Maize flour	Semolina flour	Sugar	Salt	Bouillon
Consumed foods	90.3	28.2	57.4	28.7	88.2	99.2	98.9
Purchased foods	80.7	25.3	29.2	26.2	87.3	99	97.5
Branded foods	32.9	12.9	1.2	22.8	59.4	46.6	94.3
Foods labelled as fortified	31.4	12.9	0.5	22.8	22.2	20.8	60.7
*Food fortified (in any amount)	30.3	12.7	0	22.7	21.3	46.7	

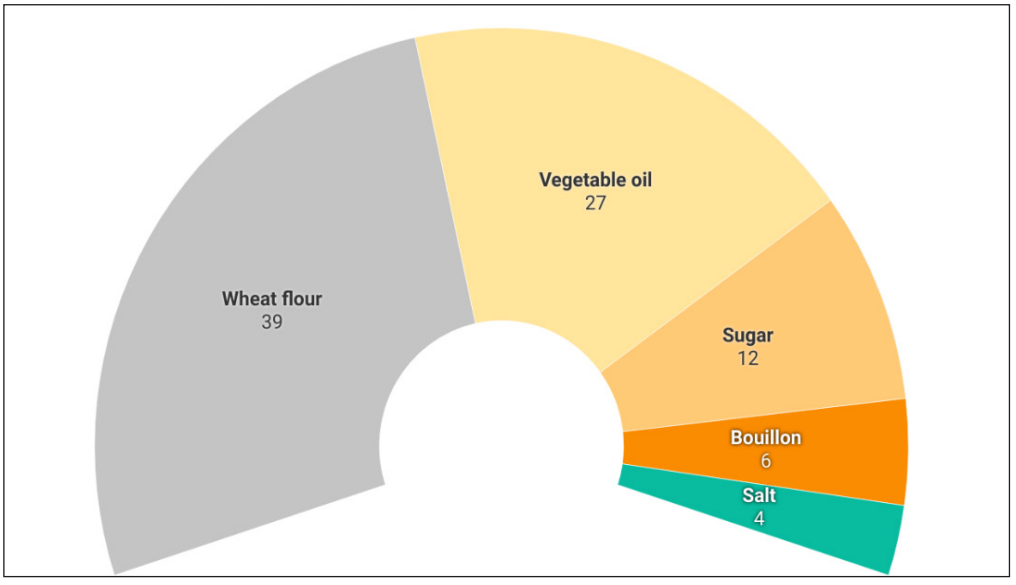
***Consumption of fortified food vehicles**:* A high proportion of households of sampled non-pregnant women of reproductive age consumed vegetable oil (90 percent), sugar (88 percent), salt (99 percent), and bouillon (99 percent) in any form.

Consumption of flours: Fewer households of sampled non-pregnant WRA consumed flours in any form (57 percent for maize flour, 29 percent for semolina flour, and 28 percent for wheat flour).

Consumption of branded food vehicles: The proportion of respondents whose households consumed these foods in a branded* form was 33 percent for vegetable oil, 22 percent for sugar, 13 percent for wheat flour, <1 percent for maize flour, 23 percent for semolina flour, 47 percent for salt, except for bouillon, which remained high at 96 percent.

Consumption of unbranded and unknown oil: Higher in the northern zones (65 percent North central, 56 percent North East, and 68 percent North West) compared to the southern zones (South East 23 percent, South South 26 percent and South West 32 percent).

Usual intake of food vehicles (in grams) among non-pregnant women



Usual intake of vegetable oil: The mean usual intake of vegetable oil among non-pregnant women was 27 grams

Usual intake of wheat flour: The mean usual intake of wheat flour among non-pregnant women was 39 grams

Usual intake of sugar: The mean usual intake of sugar among non-pregnant women was 12 grams

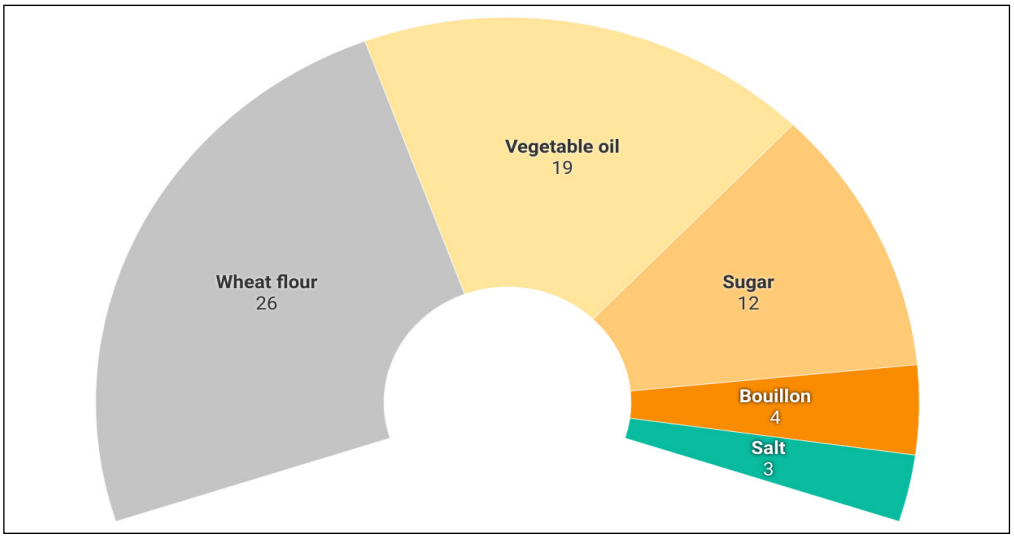
Usual intake of salt: The mean usual intake of salt among non-pregnant women was 4 grams

Usual intake of bouillon: The mean usual intake of bouillon among non-pregnant women was 6 grams.

Usual intake of rice: The mean usual intake of rice (raw) among non-pregnant women was 61 grams.

Contribution of fortifiable vehicles to energy intake: vegetable oil contributed 13 percent, wheat (8 percent), sugar (5 percent), and rice (25 percent).

Usual intake of food vehicles (in grams) among children



Usual intake of fortifiable vehicles among children: The mean usual intake of vegetable oil among children was 19 grams, wheat flour (26 grams), sugar (11.5 grams), salt (2.6 grams), bouillon (4 grams), and rice (38 grams).

Fortification status of household food samples

Fortification of food vehicles collected in a sub-sample of non-pregnant women: Most samples were fortified at any level. Vitamin A in sugar (74 percent), iodine in salt (100 percent), iron and zinc in wheat flour (100 percent each) while iron and zinc in semolina flour was also 100 percent. Conversely, about one-third was fortified at any level with vitamin A in vegetable oil (31 percent) and vitamin A in wheat flour (26 percent).

Mean amounts of fortificants in food vehicles collected in a sub-sample of non-pregnant women: 2.6 mg/kg vitamin A in vegetable oil, 3.1mg retinyl palmitate/kg vitamin A in sugar, 60 mg/kg iodine in salt, 0.8 mg retinyl palmitate/kg vitamin A, 53.9 mg/kg iron, and 42.2 mg/kg zinc in wheat flour, and 0.8 mg retinyl palmitate/kg vitamin A, 38.6 mg/kg iron, and 36.0 mg/kg zinc in semolina flour.

Diet Quality

Proportion of women who achieved Minimum Dietary Diversity for Women (MDD-W)

Minimum Dietary Diversity Score: *T*he diversity score of non-pregnant women in Nigeria is 3.6 out of a possible score of 10 (3.0 in the North West and 4.6 in the South West).

Minimum Dietary Diversity for Women (MDD-w): 27.7 percent of non-pregnant and 28.8 percent of pregnant women achieved minimum dietary diversity. The proportion of non-lactating and lactating women who achieved minimum diversity were 28 percent and 25 percent respectively (13.3 percent in North West and 53.8 percent in South West).

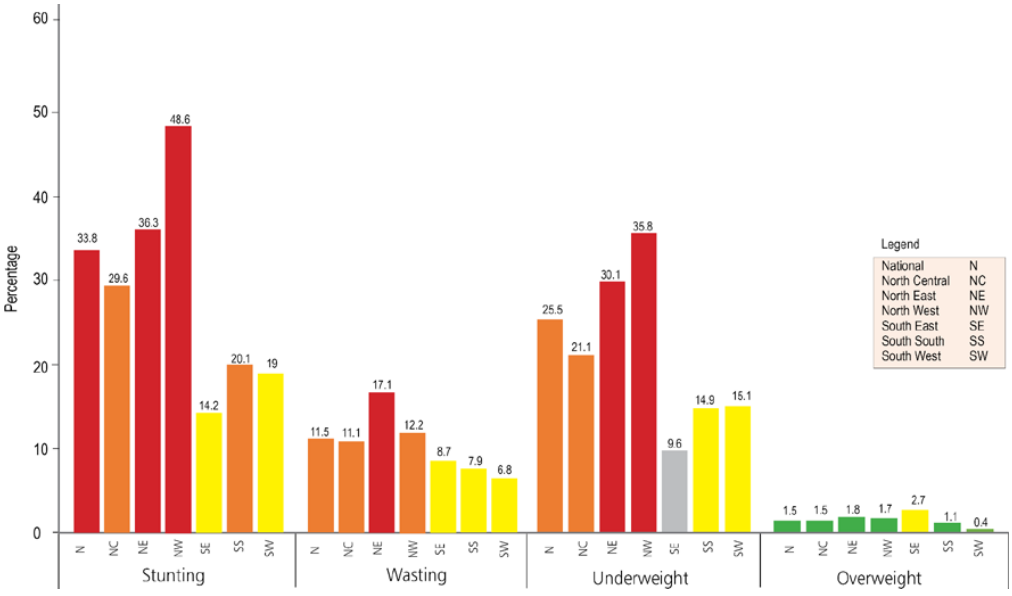
Global Diet Quality Score (GDQS): More than two-thirds of women (72.2 percent of non-pregnant women and 69.9 percent of pregnant women) had a GDQS between 15 and 23, which corresponds to a moderate risk of poor diet quality outcomes.

Global Diet Recommendations (GDR): The GDR Protect score reflects adherence to global dietary recommendations on healthy components of the diet, and scores can range between 0 and 9. The higher the GDR score, the more recommendations are likely to be met and vice-versa. The mean score was 4.0 for non-pregnant women and 4.1 for pregnant women.

The GDR Risk score: The GDR Risk score is used as a proxy for ultra-processed food intake and scores can range between 0 and 9. Across all categories, the score was below 2 ranging between 0.6-1.5.

Key Findings for Anthropometry

Children aged 6-59 months



Anthropometric status for children (aged 6-59 months), Nigeria 2021

Stunting: Nationally, stunting is very high (33.8 percent) in children 6-59 months, and differs by age category (lowest in the 6-11-months (16.8 percent) and more than double at 39.8 percent in the 24-35-months, residence (rural is 40.0 percent and 20.8 percent in urban areas), zones (14.2 percent in the South East and 48.6 percent North West zone), wealth (47.9 percent among poor and 13.2 percent among wealthy), and level of education completed by caregiver (45.6 percent with none and 14.6 percent with post-secondary education).

Severe Stunting: One in six (17.1 percent) children 6-59 months is severely stunted nationally and differs by age (21 percent among 24-35 months and 7 percent among 6-11 months), residence (21.3 percent in rural and 8.4 percent in urban areas), zone (28.1 percent in North West and 5.3 percent in South West), wealth (29.4 percent among poor and 3.7 percent among rich), and level of education completed by the caregiver (25.9 percent with none and 4.8 percent with post-secondary).

Wasting: Overall, wasting is high (11.5 percent) and differs by age (25.4 percent in 6-11-months and 5.1 percent in 36-47 months), zones (17.1 percent in North East and 6.8 percent in South West), and wealth (14.3 percent among poor and 8.6 percent among rich).

Severe Wasting: Nationally, severe wasting is high (3 percent) and differs by age (6.5 percent in 6-11 months and 1 percent in 36-47 months), and zones (6.3 percent in North East and 1.2 percent in South West).

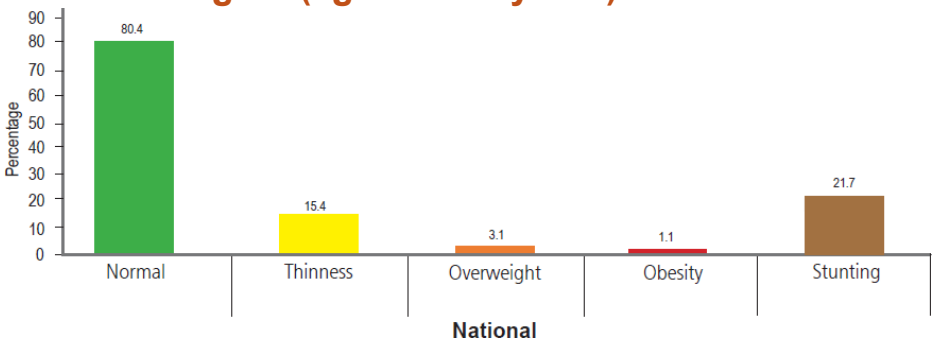
Underweight: One in four children aged 6-59 months (25.5 percent) is underweight, and differs by sex (27.3 percent among males and 23.7 percent among females), residence (29.4 percent in rural and 17.4 percent in urban areas), zone (35.8 percent in North West and 9.6 percent in South East), wealth (36.8 percent among poor and 13.9 percent among rich) and level of education completed by caregiver (33.3 percent with no education and 13.5 percent with post-secondary education).

Severe Underweight: Overall, the prevalence of severe underweight in children (aged 6-59 months) was 9.3 percent and differs by age, (11.4 percent among 6-11 months and 6.5 percent among 36-47 months), residence (11.1 percent in rural and 5.4 percent in urban areas), zone (13.7 percent in North West and 2.4 percent in South East), wealth (15.7 percent among poor and 4 percent among rich), and level of education completed by caregiver (14.8 percent with no education and 2.4 percent with post-secondary education).

Overweight: Overweight in children 6-59 months was low (1.5 percent) and no significant variation across the background characteristics.

Obesity: Overall, obesity in children (6-59 months old) was 0.6 percent and differs by zone (1.7 percent in South East and 0.1 percent in South West and South South).

Adolescent girls (aged 10-14 years)



Prevalence of normal weight, thinness, overweight, obesity and stunting among adolescent girls (aged 10-14 years), Nigeria 2021

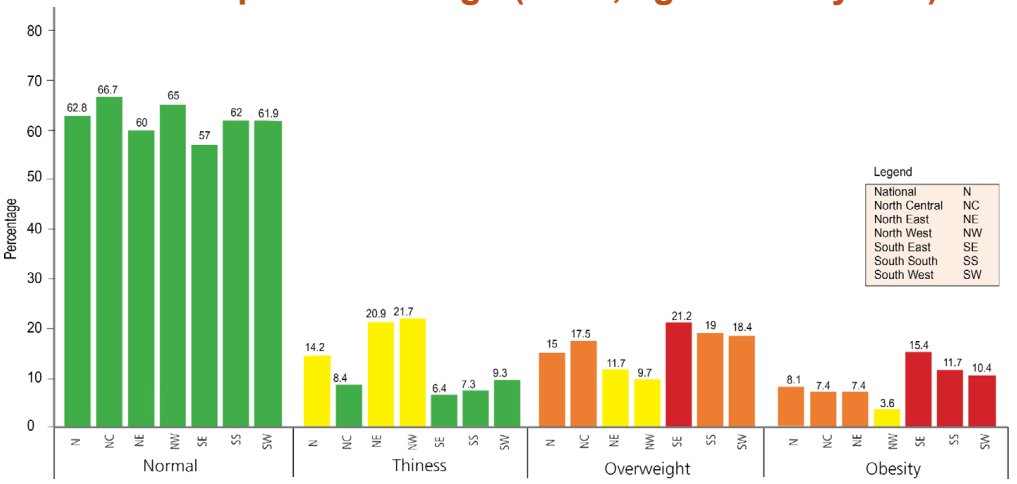
Stunting: Overall, one in five (21.7 percent) adolescent girls aged 10-14 years are stunted and differs by residence (25.8 percent in rural areas and 14.5 percent in urban areas), and wealth (33.2 percent among poor and 9.6 percent among rich).

Thinness: Nationally, 15.4 percent are thin and there is no significant variation in the prevalence of thinness in adolescent girls (aged 10-14 years old) across the background characteristics.

Overweight: Overweight is very low (3.1 percent) nationally among adolescent girls (aged 10-14 years old) and differs by residence (4.4 percent in urban and 2.3 percent in rural areas) and wealth (5.6 percent among rich and 1.8 percent among poor).

Obesity: Overall, obesity is 1.1 percent and there was no significant variation across the background characteristics.

Women of Reproductive Age (WRA, aged 15-49 years)



Prevalence of thinness, normal weight, overweight, and obesity among WRA (aged 15-49 years), Nigeria 2021

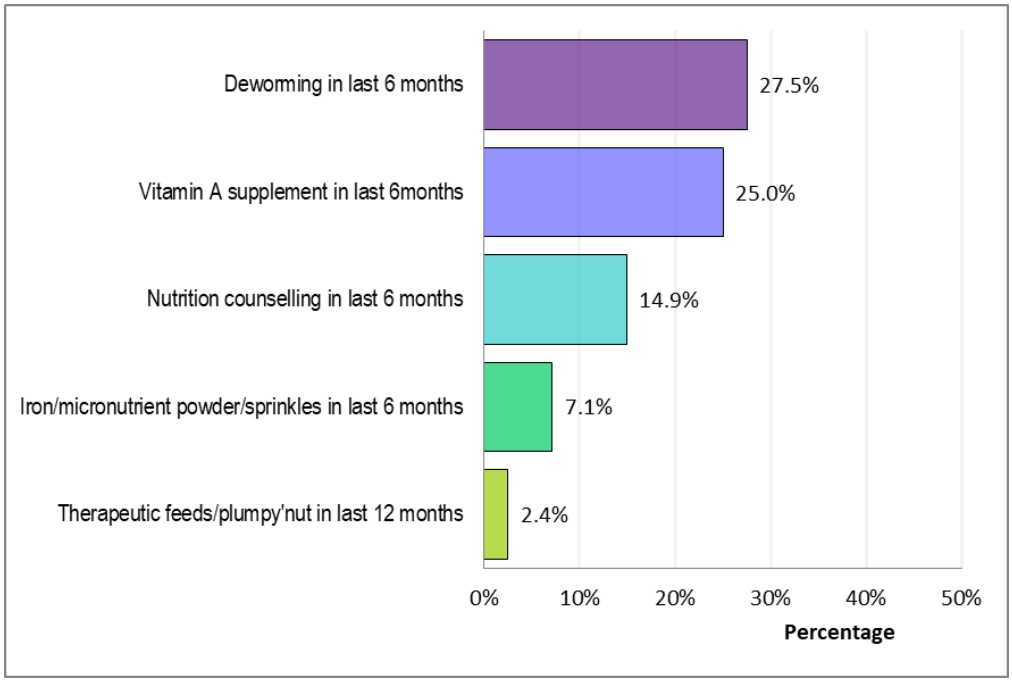
Thinness: Overall, the prevalence of thinness is 14.2 percent and differs by age (18.4 percent among 20-29 years and 9.9 percent among 15-19 years), residence (16.1 in rural and 11.1 percent in urban areas), zones (21.7 percent in North West and 6.4 percent in South East), wealth quintile (27.3 percent among poor and 6.9 percent among rich), and level of education completed (22.5 percent with no education and 9.2 percent with post-secondary).

Overweight: Nationally, 15 percent are overweight and differs by age (24 percent among 40-49 years and 4.2 percent among 15-19 years), residence (17.9 percent in urban and 13.1 percent in rural areas), zones (21.2 percent in South East and 9.7 percent in North West), wealth (21.4 percent among rich and 8.1 percent among poor), and level of educational completed (24 percent among those with post-secondary and 10.7 percent among those with none).

Obesity: Overall, 8.1 percent are obese and differ by age categories (15.6 percent among 40-49 years and 1.6 percent among 15-19 years), residence (12.5 percent in urban and 5.2 percent in rural areas), zones (15.4 percent in South East and 3.6 percent in North West), wealth (15.9 percent among rich and 2.2 percent among poor), and level of education completed (16.3 percent among those with post-secondary and 4 percent among those with no education).

Coverage of national interventions to improve micronutrient status.

Intervention coverage among children aged 6-59 months.



Coverage of nutrition-specific interventions among children (aged 6-59 months), Nigeria 2021

Vitamin A Supplementation: Coverage is low. One in four children (25 percent) received a vitamin A capsule in the last 6 months nationally, and differed by age (32.6 percent in 6-11 months and 20.1 percent in 36-47 months), residence (36.1 in urban and 19.3 percent in rural), zones (41.9 percent in North Central and 8.0 in North West), wealth (41.7 percent among rich and 12.8 percent among poor) and level of education completed by caregiver (41.7 percent with post-secondary and 18.5 percent with no education).

Nutrition Counselling*:* It is poor, only 15 percent of caregivers received some form of nutrition counseling nationally.

Coverage of nutrition counseling and specific key messages: For those who received counselling, 81 percent of caregivers reported receiving counseling on breastfeeding; 83 percent on when to start feeding foods other than breastmilk; 87 percent on giving a variety of foods; 89 percent on giving animal source foods; 85 percent on how often to feed a child; and 75 percent on not feeding sugary drinks.

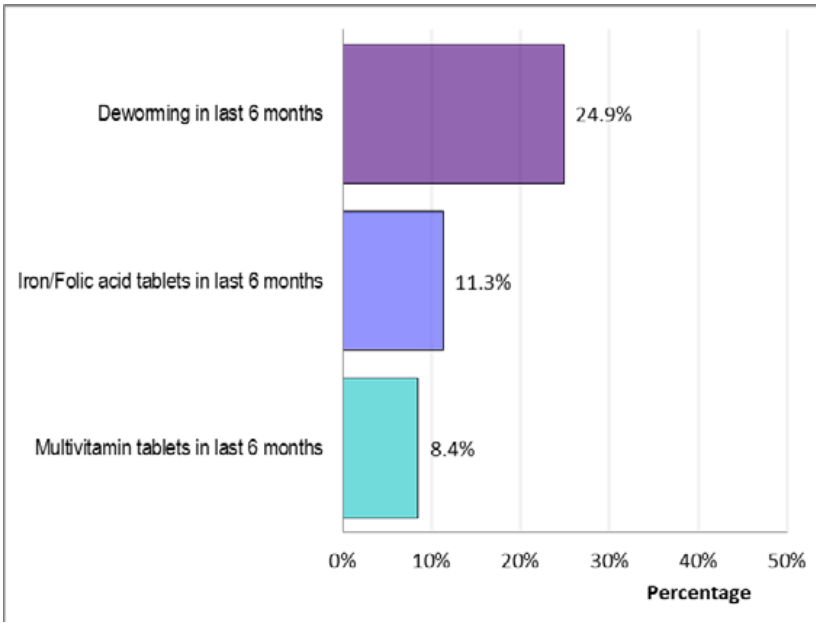
Use of micronutrient powder or any sprinkles with iron: Coverage is very low. Use of iron/micronutrient powder is 7.1 percent nationally and differs by zone (10.4 percent in South West and 2 percent in South East.

Deworming: Deworming treatment was 27.5 percent nationally and differs by age 33 percent among 48-59 months and 16.9 percent among 6-11 months), residence (41.2 percent in urban and 20.3 percent in rural areas), zone (60.2 percent South South and 7.5 percent in North West), wealth (51.7 among rich and 13 percent among poor), and level of education completed by caregiver (46.2 percent with post-secondary and 17.9 percent with no education).

Use of ready-to-use therapeutic feeds/plumpy'nut: The use of therapeutic foods in the past 12 months is low (2.4 percent) nationally, and differs by zone (0.5 percent in South East and 5.9 percent in North East); overall, 14.1 percent reported using it the day preceding the survey and differs by zone (49.8 percent in South South and 14.1 percent in South West).

Wasted children who received ready-to-use therapeutic feeds/plumpy'nut: Nationally, only 2.8 percent received ready-to-use therapeutic foods in the past 12 months and 21 percent of children received it the day preceding the survey.

Intervention coverage among adolescent girls (aged 10-14 years)

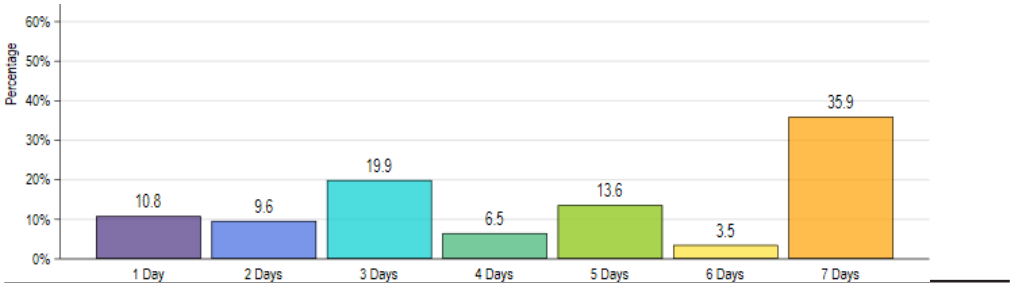


Coverage of nutrition-specific interventions among adolescent girls, Nigeria 2021

Use of multivitamins in the past six months: Only 8.4 percent of adolescent girls used multivitamins and differs by residence (13 percent in urban and 6 percent in rural areas) and wealth (15.1 percent among rich and 1 percent among poor). There was no significant variation in the use of multivitamins at least once in the past seven days, among adolescent girls across the background characteristics.

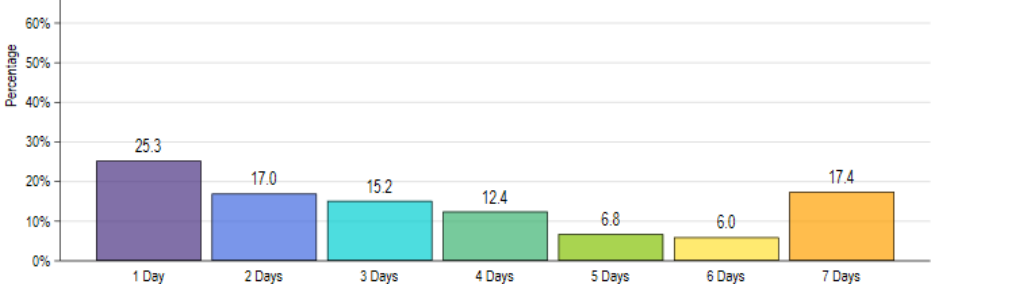
Use of iron or iron/folic acid tablets in the past six months: Overall, use of iron/folic acid tablets was 11 percent, and differs by residence (16 percent in urban and 8 percent in rural areas) and wealth (22 percent among rich and 5.7 percent among poor). There was no significant variation in the use of iron or iron/folic acid tablets at least once in the past seven days, among adolescent girls across the background characteristics.

Deworming in the past six months: Overall, one in four (25 percent) adolescent girls used deworming treatment in the past 6 months and differs by residence (31 percent in urban and 21 percent in rural areas) and wealth quintile (41.2 percent among rich and 12.6 percent among poor).



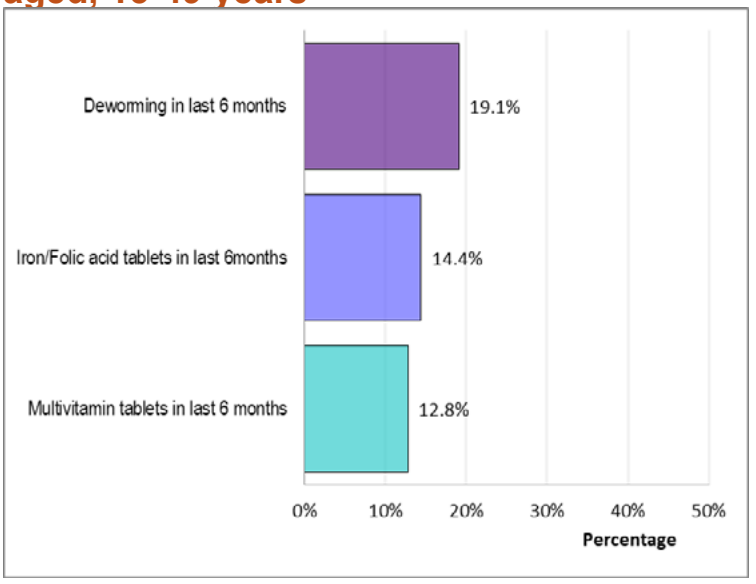
Frequency of use of multivitamins in the past seven days among adolescent girls (aged 10-14 years) who reported taking any multivitamin product seven days prior to the survey, Nigeria 2021

Frequency of use of multivitamins and iron or iron/folic acid tablets in the past seven days: Among those who indicated using multivitamins and iron or iron/folic acid tablets, 36 percent took multivitamins and 17 percent took iron/folic acid tablets for the entire seven days.



Frequency of use of any iron or iron/folic acid tablets in the past seven days among adolescent girls (aged 10-14 years) who reported taking any iron or iron/folic acid tablet seven days prior to the survey, Nigeria 2

Intervention coverage among women of reproductive aged, 15-49 years

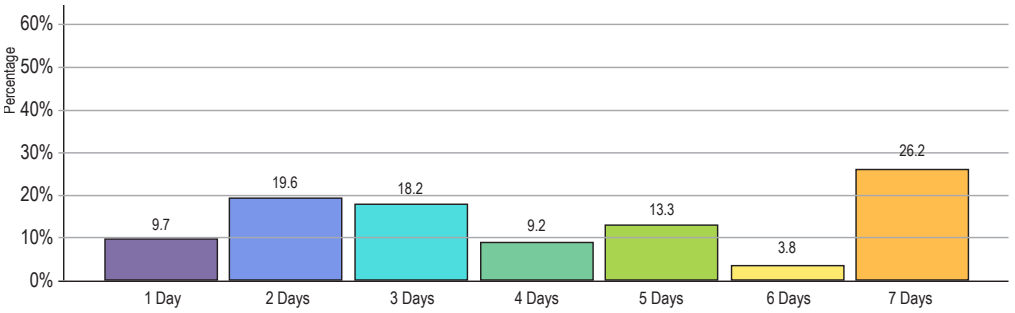


Coverage of nutrition-specific interventions among women of reproductive age (aged 15-49 years), Nigeria 2021

Use of multivitamins in the past six months: *Nationally,* 13 percent reported using multivitamins in the past 6 months and differs by age (16.2 percent among 30-39 years and 7.4 percent among 15-19 years), residence (16.2 percent in urban and 10.3 percent in rural areas), zone (27.6 percent in South West and 2.6 percent in North West), wealth (18.3 percent among rich and 6.7 percent among poor) and level of education completed (21.6 percent among those with post-secondary and 7.2 percent among those with no education).

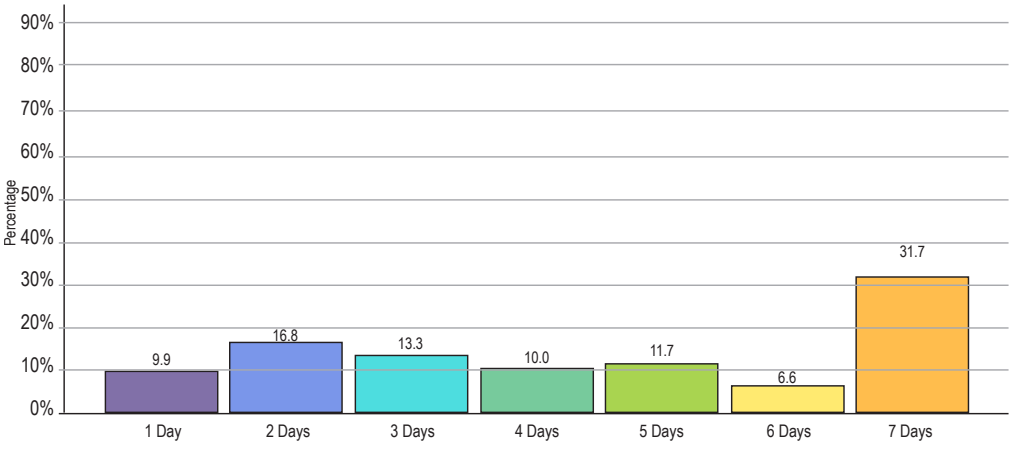
Use of iron or iron/folic acid tablets in the past six months: Overall, 14 percent of women of reproductive aged took *iron or iron/folic acid tablets* in the past six months and differs by age (17.9 percent among 40-49 years and 8.6 percent among 15-19 years), residence (18.1 percent in urban and 11.5 percent in rural areas), zone (31.9 percent in South West and 2.2 percent in North West), wealth (18.9 percent among rich and 7.7 percent among poor) and level of education completed (21 percent among those with post-secondary and 8 percent among those with no education).

Deworming in the past six months: Overall, 19 percent of women of reproductive aged reported using a deworming treatment in the past 6 months, months and differs by age (22.9 percent among 40-49 years and 16.4 percent among 15-19 years), residence (23.3 percent in urban and 15.9 percent in rural areas), zone (41 percent in South East and 7 percent in North West), wealth (30 percent among rich and 10.4 percent among poor) and level of education completed (28 percent among those with post-secondary and 10.2 percent among those with no education).



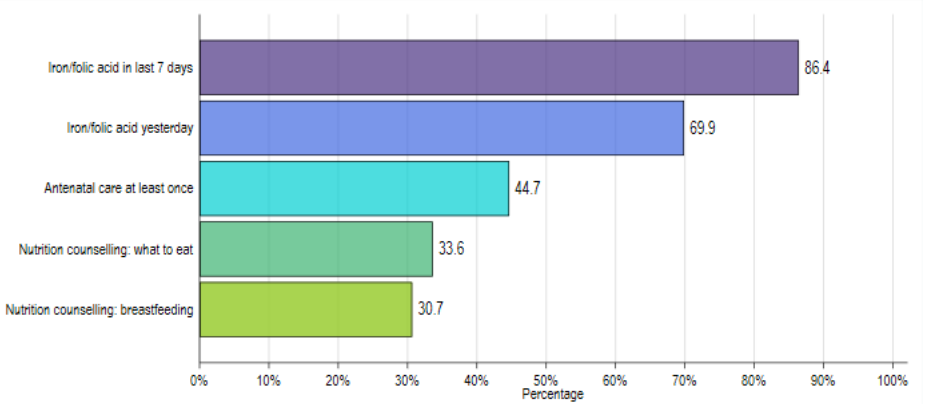
Frequency of use of multivitamins in the past seven days among WRA who reported use of a multivitamin in the past six months, Nigeria 2021

Frequency of use of multivitamins and iron or iron/folic acid tablets in the past seven days: Among those who indicated using multivitamins and iron or iron/folic acid tablets, 26 percent took multivitamins and 32 percent took iron/folic acid tablets for the entire seven days.



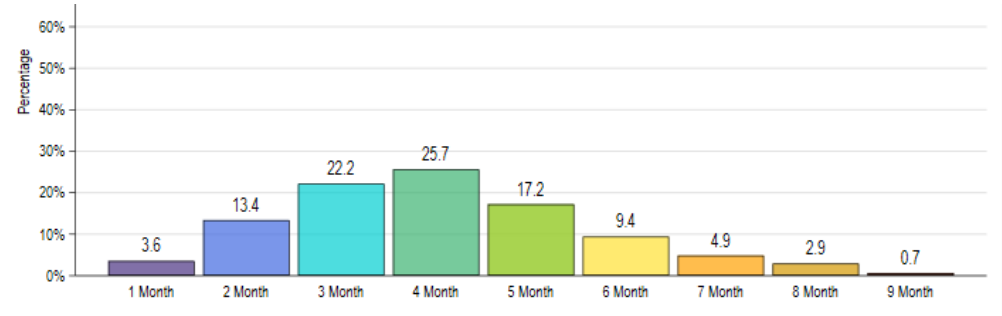
Frequency of use of any iron/folic acid tablets in the past seven days among WRA, Nigeria 2021

Intervention coverage among pregnant women (aged, 15-49 years)



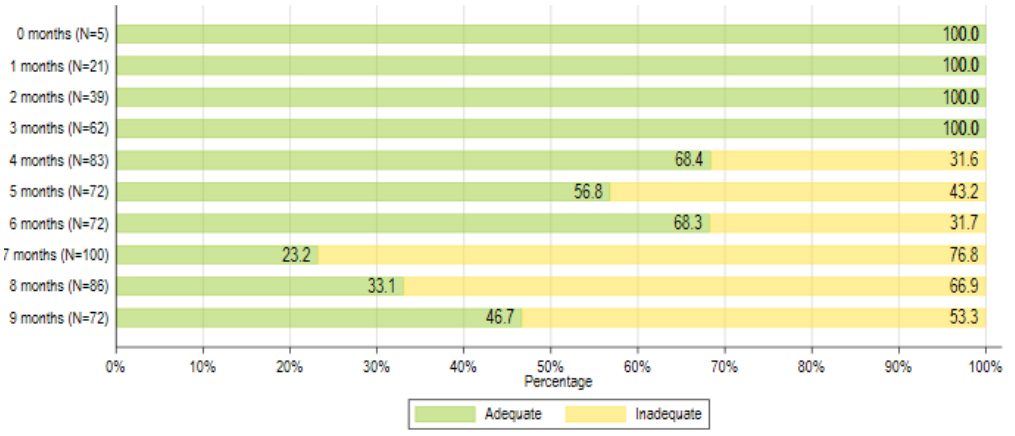
Overall prevalence of any nutrition-related interventions – antenatal care, supplementation, and nutrition counselling - among pregnant women (aged 15-49 years), Nigeria 2021

Antenatal care: Nationally, 45 percent of pregnant women reported receiving at least one antenatal care visit and differs by age category (55 percent among 40-49 years and 28 percent among 15-19 years), residence (56 percent in urban and 38.9 percent in rural areas) and wealth (64 percent among rich and 30 percent among poor).



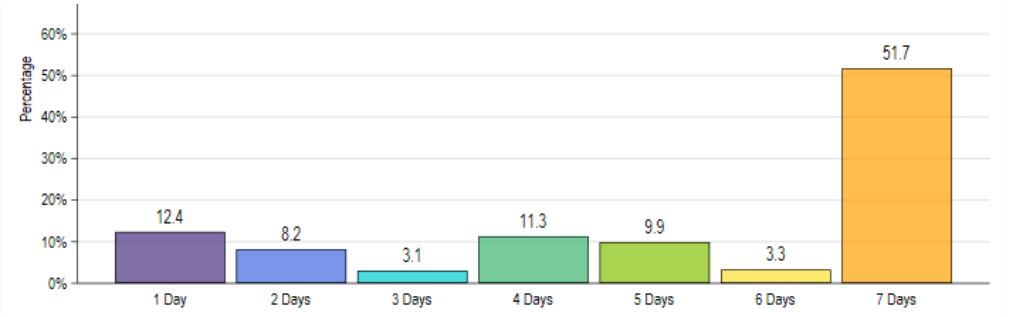
Timing of the first antenatal care visit by month of pregnancy among pregnant women, Nigeria 2021

Adequacy of number of antenatal care visits by the length of pregnancy: Although first trimester visits were adequate (100 percent) as pregnancy progressed, fewer pregnant women obtained adequate antenatal visits (77 percent at the 7th month).



Adequacy of number of antenatal care visits by the length of pregnancy among pregnant women, Nigeria 2021

Consumed a tablet or syrup containing iron at least once in the past seven days: 86 percent of pregnant women reported consuming a tablet or syrup containing iron at least once in the past seven days.



Frequency of use of iron tablet or syrup in the past seven days among pregnant women, Nigeria 2021

Consumed a tablet or syrup containing iron and/or folic acid yesterday: 70 percent of pregnant women reported taking iron/folic acid tablets the day before the interview.

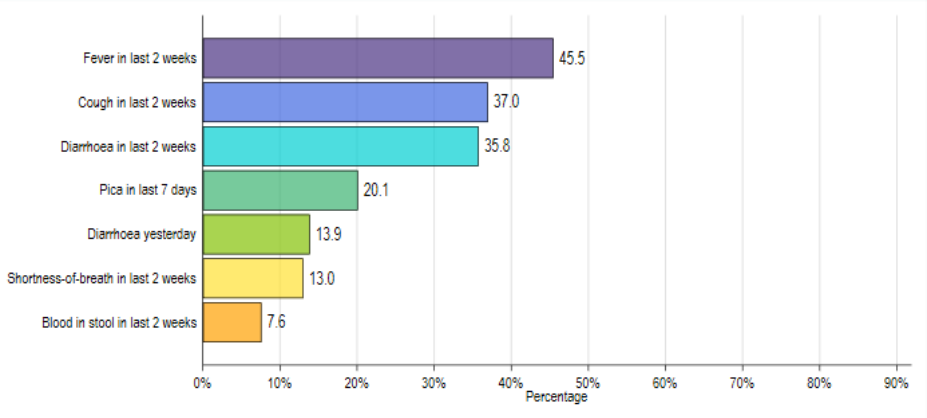
Spoke with a health worker or community volunteer about what foods to eat: Overall, 34 percent of pregnant women reported speaking to a health worker or community volunteer about what foods to eat during pregnancy and differs by age (51 percent among 40-49 years and 18 percent among 15-19 years), residence (50 percent in urban and 25 percent in rural areas), wealth (56 percent among rich and 19 among poor), and level of education completed (56 percent among post-secondary and 23 percent among those with no education).

Spoke with a health worker or community volunteer about breastfeeding: Nationally, 31 percent of pregnant women reported talking to a health worker or community volunteer about breastfeeding their newborn and differs by age (41 percent for 40-49 years and 11 percent for 15-19 years), residence (45 percent in urban and 23 percent in rural areas), wealth (52 percent among rich and 14 percent among poor), and level of education completed (51 percent among post-secondary and 24 among those with no education).

Frequency of use of iron tablet or syrup in the past seven days: *Overall,* 52 percent of the respondents took a tablet or syrup containing iron for the entire seven days.

Self-reported morbidity

Self-reported morbidity among children (aged 6-59 months)



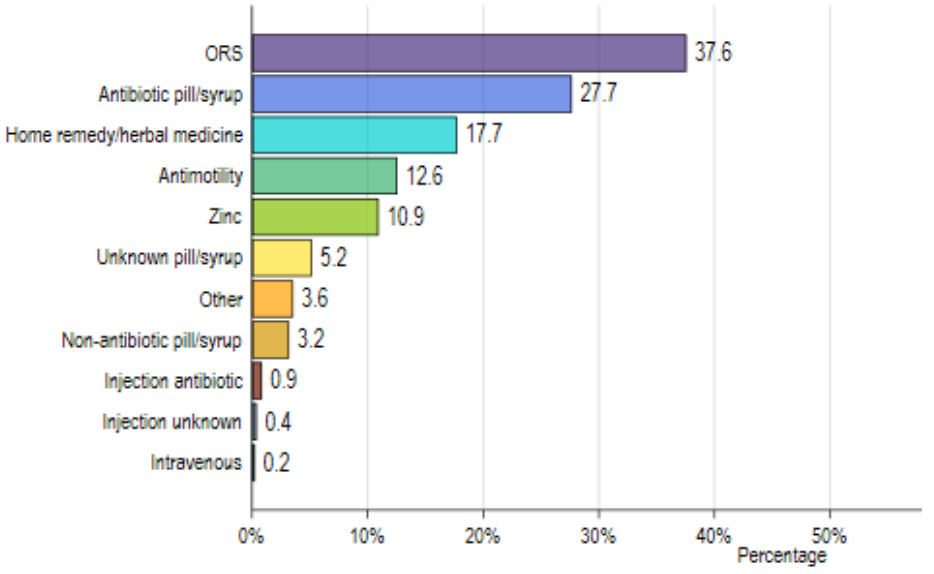
Prevalence of self-reported morbidity (reported by caregiver), and anaemia risk among children (aged 6-59 months), Nigeria 2021

Diarrhoea in the past two weeks: *Overall,* 36 percent reported having diarrhoea in the past two weeks and differs by age (46.7 percent among 6-11 months and 23.3 percent among 48-59 months), residence (39 percent in rural and 30 in urban areas), zones (45 percent in North East and 25 percent in South West), wealth (42 percent among poor and 30 percent among rich), and level of education completed by caregiver (41 percent among those with none and 25 percent among those with post-secondary).

Diarrhoea yesterday: those who reported having diarrhoea a day before the interview were 14 percent, nationally and differs by age (23.8 percent among 6-11 months and 5.8 percent among 48-59 months), sex (15.6 percent among males and 12 percent among females), zone (20 percent in North East and 6 percent in South West), wealth (19 percent among poor and 9 percent among rich), and level of education completed by caregiver (19 percent among those with no education and 9.6 percent among those with post-secondary).

Blood in stool in the past two weeks: 8 percent of children reported having blood in stool and this differs by zones (10 percent in North East and 4 percent in South West) and wealth (11 percent among poor and 2.4 percent among rich).

*T**reatments for diarrhoea in children**: Nationally, 38 percent used* Oral Rehydration Salt (ORS), 28 percent used antibiotic pill/syrup, 13 percent used antimotility, and 11 percent used zinc and differing by residence (51 percent in urban and 33 percent in rural areas) and wealth (56 percent among rich and 31 percent among poor) for ORS; zones (36 percent in North West and 9 percent in South South) and level of education completed by caregiver (40 percent among those with no education and 23 percent among those with post-secondary) for antibiotic pill/syrup; and residence (27 percent in urban and 8 in rural areas) and zones (34 percent in North East and 1 percent in North West) for antimotility.



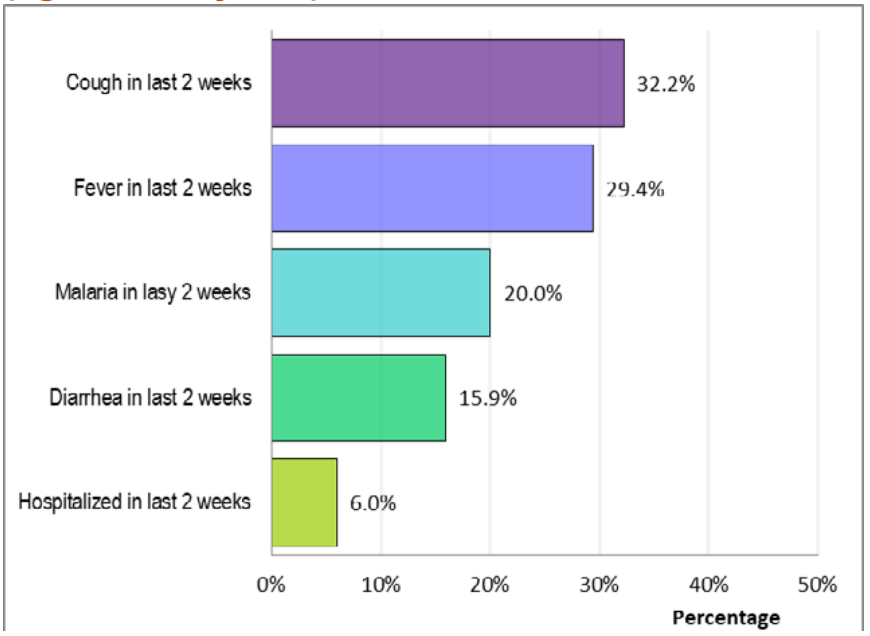
Reported treatments for diarrhoea in children (aged 6-59 months), Nigeria 2021.

Fever: Overall, 46 percent were reported to have had a fever in the past two weeks, and differs by age (50 percent among 12-13 months and 37 percent among 48-59 months) and zone (53 percent in North East, South East and 39 percent in South West).

Cough: Nationally, 37 percent of children had a cough in the last two weeks, and differs by age (40 percent among 12-23 months and 32 percent among 48-59 months), zone (51 percent in South East and 23 percent in North West), wealth (45 percent among rich and 33 percent among poor), and level of education completed by caregiver (45 percent among those with post-secondary and 32 percent among those with none).

Difficulty breathing: The prevalence of fast, short, rapid breaths or difficulty breathing was 13 percent and differs by zones (22 percent in North East and 8 percent in South West), wealth (10 percent among the rich and 21 percent among the poor), and level of education completed by caregiver (17 percent among those with no education and 13 percent among those with post-secondary).

Self-reported morbidity among adolescent girls (aged 10-14 years).



Overall prevalence of self-reported illness and hospitalization/clinic visits in the last two weeks among adolescent girls (aged 10-14 years), Nigeria 2021

Cough in the past two weeks: *Overall,* 32 percent reported having a cough, and no significant variation in the prevalence of cough in the past two weeks among adolescent girls across the background characteristics.

Fever in the past two weeks: Nationally, 29 percent reported having a fever, and no significant variation in the prevalence of fever in the past two weeks among adolescent girls across the background characteristics.

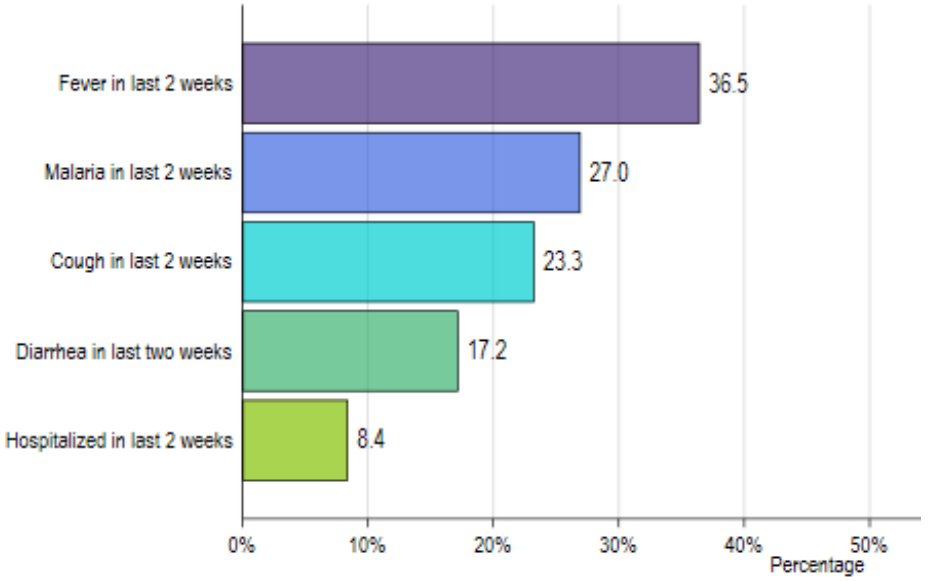
Malaria in the past two weeks: One in five (20 percent) adolescent girls 10-14 years reported having malaria and no significant variation in the prevalence of malaria in the past two weeks among adolescent girls across the background characteristics.

Diarrhoea in the past two weeks: Only 16 percent reported having diarrhoea and no significant variation in the prevalence of diarrhoea in the past two weeks among adolescent girls across the background characteristics.

Difficulty breathing in the past two weeks: Overall, 32 percent reported having difficulty in breathing differing by wealth (59 among poor and 19 among rich).

Hospitalization/clinic in the past two weeks: The prevalence of hospitalization was low (6 percent) nationally and no significant variation in hospitalization/clinic in the past two weeks among adolescent girls across the background characteristics.

Self-reported morbidity among women of reproductive age (aged 15- 49 years)



Overall prevalence of self-reported illness and hospitalization/clinic visits in the past two weeks among WRA (aged 15-49 years), Nigeria 2021

Cough in the past two weeks: Overall, 23 percent reported having a cough, and differ by zones (31 percent in North East and 18 percent in South West)

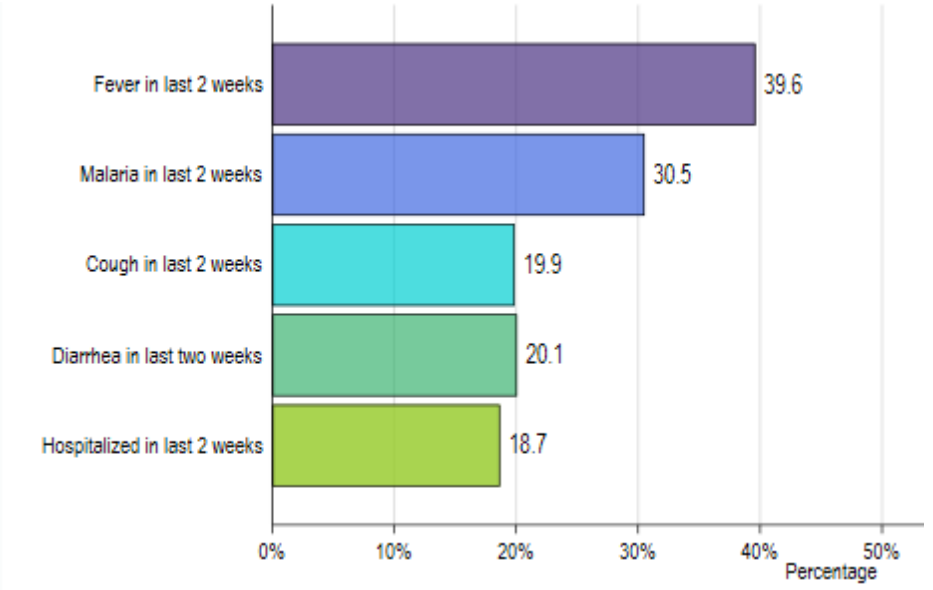
Fever in the past two weeks: Nationally, 37 percent reported having a fever, and different by age (41 percent among 40-49 years), residence (42 percent in rural and 30 percent in urban areas), zone (49 percent in South South and 27 percent in North West), wealth (42 percent among poor and 29 percent among rich), and level of education completed (42 percent among those who completed primary education and 28 percent among those with post-secondary).

Malaria in the past two weeks: (27 percent) of women of reproductive age reported having malaria and differs by age (33 percent among 40-49 years and 20 percent among 15-19 years), residence (30 percent in rural and 23 percent in urban), zones (51 percent in South South and 14 percent in North West), and level of education completed (34 percent among those who completed primary education and 28 percent among those with post-secondary).

Diarrhoea in the past two weeks: Only 17 percent reported having diarrhoea and differing by zones (24 percent in North East and 14 percent in South West)

Hospitalization/clinic in the past two weeks: The prevalence of hospitalization was low (8 percent) nationally and differs by age (11 percent among 40-49 years and 6 percent among 15-19 years) and zones (20 percent in North East and 4 percent in North West).

Self-reported morbidity among pregnant women (aged 15-49 years)



Overall prevalence of self-reported illness (fever, malaria, diarrhoea, and cough) and hospitalization/clinic visits in the last two weeks among pregnant women, Nigeria 2021

Cough in the past two weeks: Overall, 20 percent reported having a cough. There was no significant variation in the prevalence of cough in the past two weeks among pregnant women across the background characteristics.

Fever in the past two weeks: Nationally, 40 percent of pregnant women reported having a fever, and differs by residence (43 percent in rural and 33 percent in urban areas), and wealth (58 percent among those in the middle quintile and 25 percent among rich).

Malaria in the past two weeks: Overall, 31 percent of pregnant women reported having malaria. There was no significant variation in the prevalence of malaria in the past two weeks among pregnant women across the background characteristics.

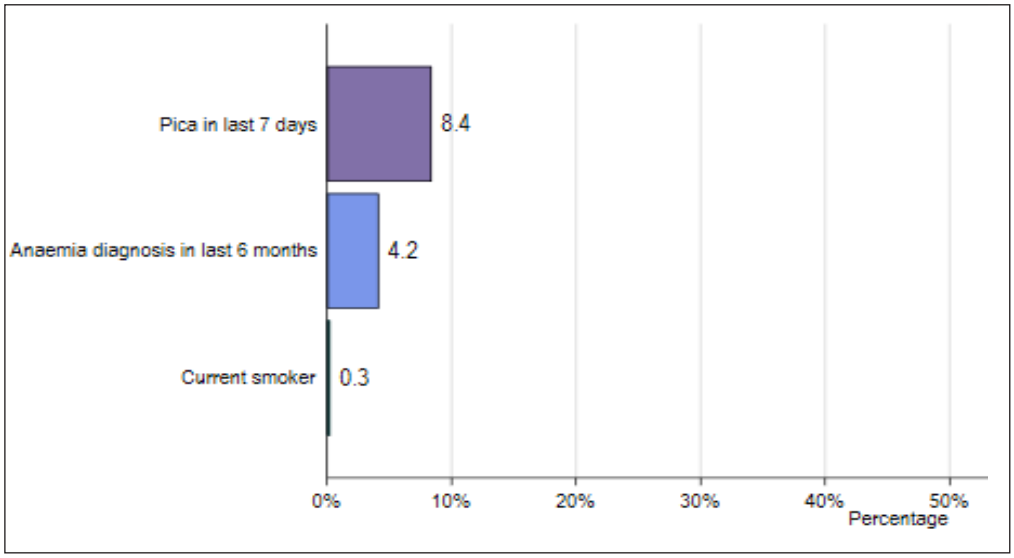
Diarrhoea in the past two weeks: Only 20 percent reported having diarrhoea. There was no significant variation in the prevalence of diarrhoea in the past two weeks among pregnant women across the background characteristics.

Hospitalization/clinic in the past two weeks: The prevalence of hospitalization was 19 percent nationally and there was no significant variation in the prevalence of hospitalization in the past two weeks among pregnant women across the background characteristics.

Self-reported anaemia risk factors in children (aged 6-59 months), adolescent girls (aged 10-14 years old), women of reproductive age (aged 15-49 years old)

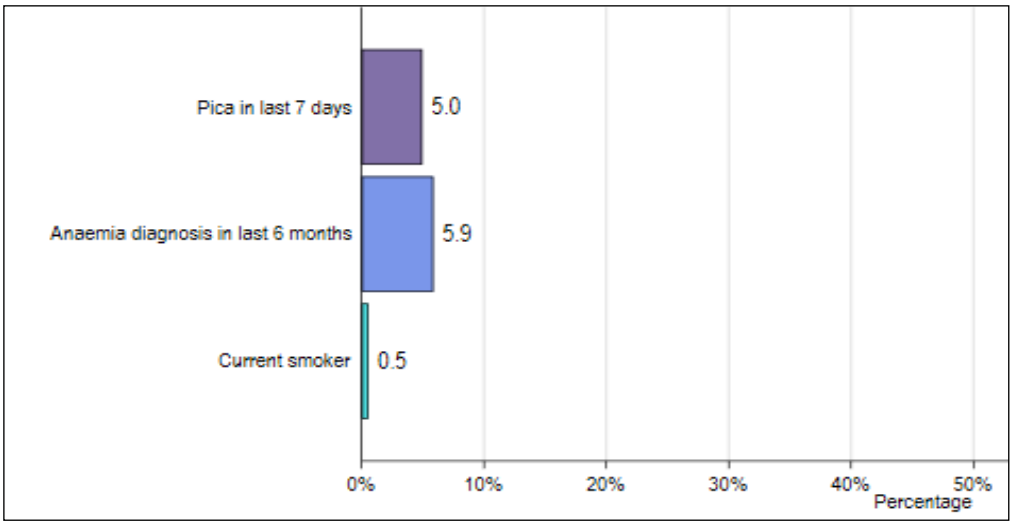
Pica children aged 6-59 months: Overall, taking pica was reported among 20 percent of the children 6-59 months seven days prior to the survey and differs by age (P < 0.001) and zones (P = 0.006)

Pica, smoking, and previous diagnosis of anaemia in adolescent girls 10-14 years: *Nationally,* 8 percent of adolescent girls (aged 10-14 years) reported taking pica seven days prior to the survey, the prevalence of self-reported smoking is only 0.3 percent, and 4 percent reported diagnosed with anaemia in the past six months. There was no significant variation in the prevalence of pica, smoking, and anaeama among adolescent girls across the background characteristics.



Prevalence of anaemia risk factors (pica, smoking and diagnosis of anaemia in the past six months) among adolescent girls (aged 10-14 years), Nigeria 2021

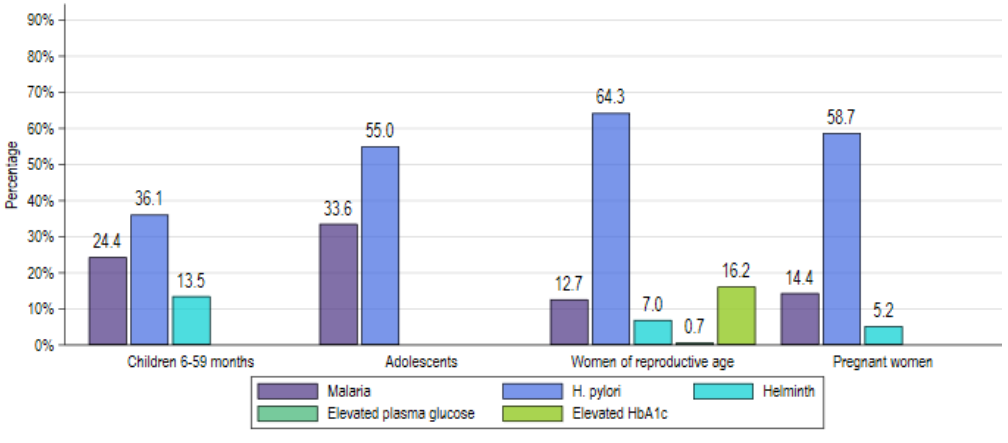
Pica, smoking, and previous diagnosis of anaemia in women of reproductive age: *Nationally,* 5 percent of women of reproductive age reported taking pica seven days prior to the survey, the prevalence of self-reported smoking is only 0.5 percent, and 6 percent reported diagnosed with anaemia in the past six months. There was significant variation in the prevalence of pica by zones (14 percent in South East and 1.3 percent in South West), smoking by residence (0.9 percent rural and 0.1 percent in urban areas), and anaemia by zones (8 percent in South South and 4 percent in South West).



Prevalence of anaemia risk (pica and smoking) and diagnosis of anaemia in the past six months among WRA (aged 15-49 years), Nigeria 2021

Pica, smoking, and previous diagnosis of anaemia among pregnant women (15-49 years old): Nationally, smoking prevalence among pregnant women (aged 15-49 years) was 0.4 percent. There was no significant variation in the prevalence of smoking among the respondents across the background characteristics.

Malaria, Helicobacter pylori (H. pylori), helminths, elevated plasma glucose, and elevated glycated haemoglobin (Hba1c) in children 6-59 months, adolescent girls 10-14 years, and women of reproductive age 15-49 years



Overall prevalence of malaria, H. pylori, helminths, elevated plasma glucose, and elevated HbA1c among children 6-59 months, adolescent girls, WRA, and pregnant women, respectively, Nigeria 2021.

Malaria:

Children 6-59 months: Nationally, the prevalence of malaria among children is 24 percent. Significant differences were observed among children by age (30 percent among 48-59 months and 15 among 6-11 months), residence (31 percent in rural and 11 percent in urban), wealth (33 percent among poor and 8 percent among rich), and level of education completed by caregiver (29 percent among those with no education and 7 percent among those with post-secondary).

Adolescent girls 10-14 years: Overall prevalence of anemia in this group was high, 34 percent of adolescent girls had malaria, and was different by residence (45 percent in rural and 17 percent in urban areas) and wealth (53 percent among poor and 9 percent among rich).

Women of reproductive age: Only 13 percent women of reproductive age had malaria and differed by age (21 percent among 15-19 years and 8 percent among 40-49 years), residence (17 percent in rural and 7 percent in urban), wealth (19 percent among poor and 5 percent among rich), and level of education completed 14 percent among those with no education and 5 percent among those with post-secondary).

Pregnant women: 14 percent of pregnant women had malaria. Differences were observed for age (38 percent among 15-19 years and 8 percent among 30-39 years), residence (18 percent in rural and 7 percent in urban areas), and wealth (23 percent among poor and 4 percent among rich).

H. pylori

Children 6-59 months: Overall, H. pylori was prevalent among 36 percent of children, Significant difference were observed among children by age (42 percent among 48-59 months and 32 percent among 6-11 months), sex (38 percent among males and 34 percent among females), and zones (52 percent in South East and 36 percent in South West).

Adolescent girls 10-14 years: 55 percent among adolescent girls nationally and significantly different by age (43 percent among 11 years and 66 percent among 12 years).

Women of reproductive age: 64 percent prevalence among women of reproductive age nationally and differed by age (67 percent in 40-49 years and 62 percent in 15-19 years), residence (68 percent in rural and 59 percent in urban areas), zones (76 percent in South East and 54 percent in North West) and level of education completed (69 percent among those who completed primary and 64 percent in those with none).

Pregnant women: 59 percent prevalence among pregnant women nationally and differed by wealth (71 percent among middle wealth quintile and 51 percent among rich).

Helminths

Children 6-59 months: Helminth prevalence was 14 percent among children, A significant difference was observed among children by residence (16 percent in rural and 9 percent in urban areas), zones (24 percent in North Central and 0.4 percent in South East), wealth (21 percent among poor and 9 percent among rich), and level of education completed by caregiver (20 percent among those with no education and 9 percent among those with secondary).

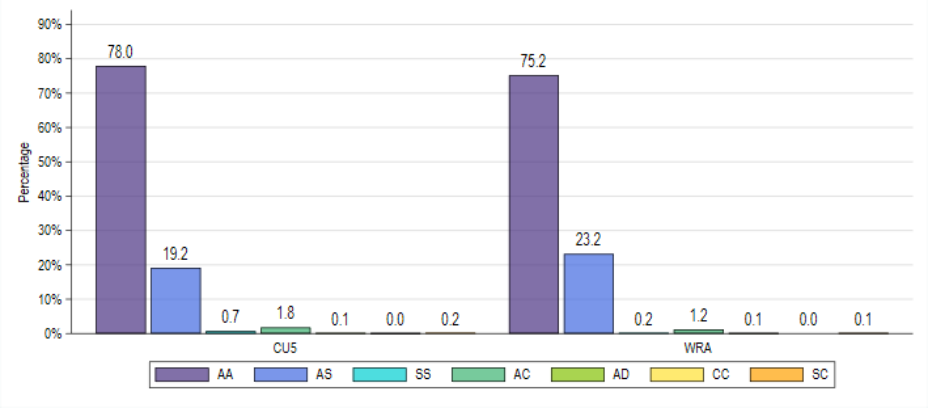
Women of reproductive age: Helminth prevalence was 7 percent among women of reproductive age and differed by residence (8 percent rural and 5 percent in urban areas), zones (15 percent in North East and 2 percent in South East), wealth (12 percent among poor and 3 percent among rich), and level of education completed (11 percent among those with no education and 4 percent among those with post-secondary) among women of reproductive age.

Pregnant women: Overall, there was a 5 percent prevalence of helminth among pregnant women. There was no significant variation in the prevalence of helminth among pregnant women (aged 15-49 years) across the background characteristics.

Elevated plasma glucose (plasma glucose > 200 mmol/L or mg/dL) in women of reproductive age: The national prevalence of elevated plasma glucose among women of reproductive age (aged 15-49 years) was 0.7 percent. There was no significant variation in the prevalence of elevated plasma glucose across the background characteristics.

Elevated HbA1c (glycated haemoglobin > 5.6%) in women of reproductive age: The national prevalence of elevated HbA1c among women of reproductive age was 16 percent. Differences were observed for age (22 percent among 40-49 years and 13 percent among 20-29 years), residence (21 percent in urban and 13 percent in rural areas), wealth (21 percent among rich and 9 percent among poor), and anthropometry status (34 percent among obese and 13 percent among thin).

Haemoglobin genotype

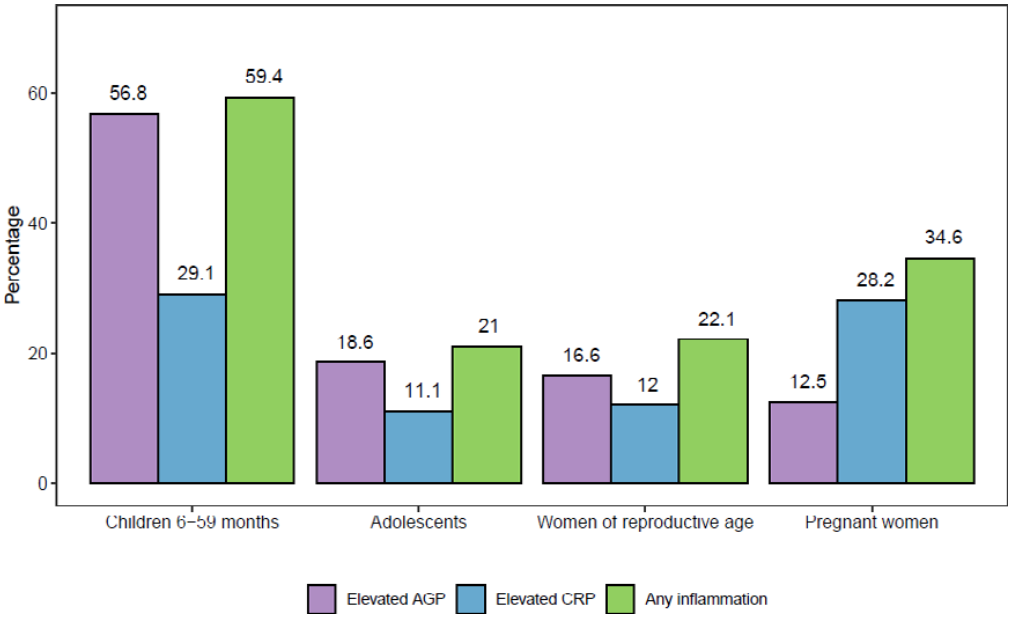


Prevalence of haemoglobin genotype by target group at national level

Haemoglobin genotype in children 6-59 months; Overall, 78 percent of children had normal haemoglobin (HbAA); 19 percent had the sickle cell trait (HbAS), and the prevalence of sickle cell disease (HbSS) was 0.7 percent. The prevalence of sickle cell trait (HbAS) was higher in children residing in rural (20.5 percent) versus urban areas (16.7 percent).

Haemoglobin genotype in women of reproductive age 15-49 years; The percentage of women of reproductive age with normal haemoglobin was 75 percent; 23 percent had the sickle cell trait and differed by zones (26 percent in North West and 20 percent in South West), and 0.2 percent had sickle cell disease and differed by residence (0.3 percent rural and 0 percent in urban areas) and wealth quintile (0.6 percent among moderately rich and 0 percent among rich).

Inflammation



Prevalence of elevated C-reactive protein (CRP), elevated alpha-1-acid glycoprotein (α-1 acid glycoprotein, AGP), and any inflammation by target group at national level, Nigeria 2021

C-reactive protein (CRP):

Children 6-59 months: Nationally, 29 percent of children 6-59 months had elevated CRP and differed by age (34 percent in 6-11 months and 22 percent in 48-59 months), residence (34 percent in rural and 21 percent in urban areas), zone (32 percent in North West and South West and 25 percent in North East), wealth (37 among poor and 22 percent among rich) and level of education completed by caregiver (34 percent among those with primary education and 16 percent among those with post-secondary).

Adolescent girls 10-14 years: 11 percent of adolescent girls 10-14 years had elevated CRP. There was no significant variation in the prevalence of elevated CRP among adolescent girls (aged 10-14 years) across the background characteristics.

Women of reproductive age 15-49 years: Overall, 12 percent of women of reproductive age had elevated CRP and differed by age (9 percent in 15-19 years and 14 percent in 40-49 years) and zone (15 percent in South South and 9 percent in North Central),

Pregnant women: Nationally, 28 percent of pregnant women had elevated CRP. There was no significant variation in the prevalence of elevated CRP among pregnant women (aged 15-49 years) across the background characteristics.

Alpha-1-acid glycoprotein (α-1AGP)

Children 6-59 months: Overall, 57 percent of children 6-59 months and differed by age (59 percent among 12-23 months and 51 percent among 48-59 months), residence (65 percent in rural and 42 percent in urban), zones (64 percent in North West and 43 percent in South East), wealth (66 among poor and 41 percent among rich) and level of education completed by caregiver (66 percent among those with no education and 37 percent among those with post-secondary).

Adolescent girls 10-14 years: Overall, 19 percent of adolescent girls 10-14 years had elevated α-1AGP and differed by wealth (25 percent among poor and 13 percent among rich),

Women of reproductive age 15-49 years: Nationally, 17 percent of women of reproductive age and differed by age (18 percent in 15-19 years and 15 in 40-49 years), residence (19 percent in rural and 14 percent in urban), zones (24 percent in North West and 12 percent in South West), wealth (21 percent among poor and 14 percent among rich) and level of education completed (20 percent among those with no education and 11 percent among those with post-secondary),

Pregnant women: 13 percent of pregnant women had elevated α-1AGP nationally. There was no significant variation in the prevalence of elevated AGP among pregnant women (aged 15-49 years) across the background characteristics.

Any inflammation (both CRP and α-1AGP elevated):

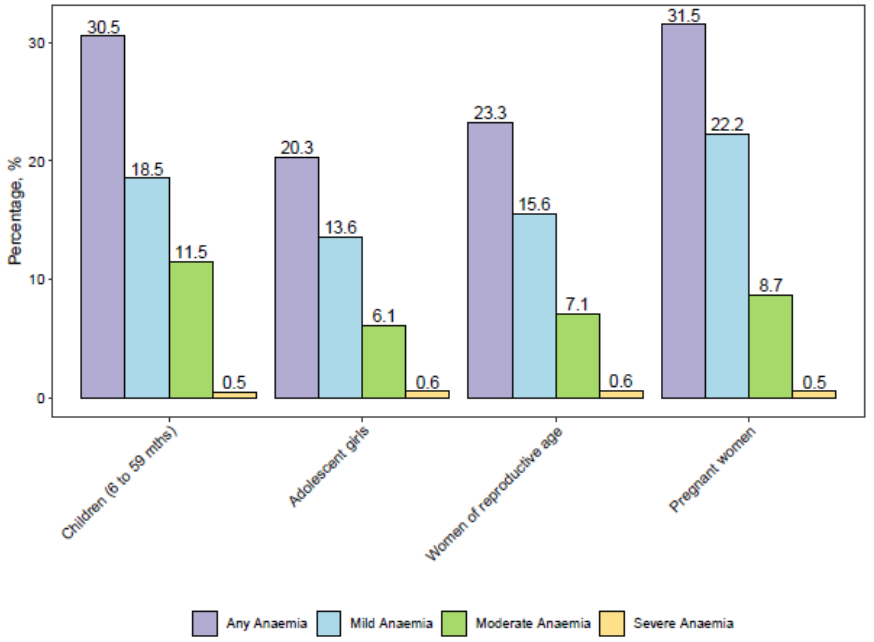
Children 6-59 months: Nationally, 59 percent of children 6-59 months had both CRP and α-1AGP elevated and differed by age (62 percent among 12-23 months and 53 percent among 48-59 months), residence (67 percent in rural and 45 percent in urban), zones (66 percent in North West and 48 percent in South East), wealth (68 percent among poor and 44 percent among rich) and level of education completed by caregiver (67 percent among those with no education and 41 percent among those with post-secondary).

Adolescent girls 10-14 years: 21 percent of adolescent girls 10-14 years had both CRP and α-1AGP elevated nationally and differed by residence (22 percent in rural and 20 percent in urban) and wealth (27 percent among poor and 16 percent among rich).

Women of reproductive age 15-49 years: 22 percent of women of reproductive age had both CRP and α-1AGP elevated nationally and differed by residence (23 percent in rural and 21 percent in urban), zone (28 percent in North West and 17 percent in North Central), wealth (25 percent among poor and 19 percent among rich) and level of education completed (25 percent among those with no education and 17 percent among those with post-secondary),

Pregnant women: Overall, 35 percent of pregnant women had both CRP and AGP elevated. There was no significant variation in the prevalence of any inflammation among pregnant women (aged 15-49 years) across the background characteristics.

Anaemia



Overall prevalence of any, mild, moderate, and severe anaemia by target group, Nigeria 2021

Children (6-59 months old)

Any anaemia: Nationally, 31 percent of children (6-59 months old) had any anaemia nationally. There was a statistically significant difference in the prevalence of any anaemia among children (aged 6-59 months) by age (42 percent in 6-11 months and 22 percent in 48-59 months), residence (36 percent in rural and 21 percent in urban), zones (42 percent in North West and 23 percent in North Central), wealth (38 percent among poor and 18 percent among rich), and level of education completed by caregivers (36 percent among those with no education and 16 percent among those with tertiary education).

Mild anaemia: 19 percent of children 6-59 months had mild anaemia. There was a significant variation in the prevalence of mild anaemia among children (aged 6-59 months) by age (25 percent in 6-11 months and 14 percent in 48-59 months), residence (20 percent in rural and 15 percent in urban), zones (23 percent in North West and 15 percent in North Central and South West), wealth (21 percent among poor and 13 percent among rich), and level of education completed by caregivers (22 percent among those with no education and 12 percent among those with tertiary education).

Moderate anaemia: Overall, 12 percent of children 6-59 months had moderate anaemia. There was a significant variation in the prevalence of moderate anaemia among children (aged 6-59 months) by age (17 percent among 6-11 months and 8 percent among 48-59 months), residence (15 percent in rural and 5 percent in urban), zones (17 percent in North West and 8 percent in South South), and wealth (17 percent among poor and 5 percent among rich).

Severe anaemia: Only 0.5 percent of children 6-59 months had severe anaemia. There was a significant variation in the prevalence of severe anaemia among children (aged 6-59 months) by level of education completed by caregivers (1 percent among those with no education and 0.2 percent among those with secondary education).

Adolescent girls (10-14 years old)

Any anaemia: Anaemia was present in 20 percent of adolescent girls nationally. There was a statistically significant difference in the *pre*valence of any anaemia among adolescent girls (aged 10-14 years) by age (28 percent in 12 year old and 11 percent in 11 year old) and wealth (27 percent among poor and 15 percent among rich).

Mild anaemia: The prevalence of mild anaemia was 14 percent. There was a statistically significant difference in the prevalence of mild anaemia among adolescent girls by age (22 percent among 12 year old and 7 percent among 10 year old) and wealth quintile (18 percent among poor and 9 percent among rich).

Moderate anaemia: The prevalence of moderate anaemia was 6 percent. There was no significant variation in the prevalence of moderate anaemia among adolescent girls (aged 10-14 years) across the background characteristics.

Severe anaemia: The prevalence of *mild anaemia was 0.6 percent.* There was no significant variation in the prevalence of moderate anaemia among adolescent girls (aged 10-14 years) across the background characteristics.

Women of reproductive age (15-49 years old)

Any anaemia: Nationally, anaemia was present in 23 percent of women of reproductive age. There was a statistically significant difference in the prevalence of any anaemia among women of reproductive age (aged 15-49 years) by age (21 percent among 15-19 years and 27 percent among 40-49 years), residence (28 percent in rural and 18 percent in urban), zones (26 percent in North West, South East, South South and 17 percent in South West), wealth (30 percent among poor and 20 percent among rich)

and level of education completed (27 percent among those with no education and 17 percent among those with post-secondary education).

Mild anaemia: 16 percent of women of reproductive age had mild anaemia nationally. There was a statistically significant difference in the prevalence of mild anaemia among women of reproductive age (aged 15-49 years) by residence (18 percent in rural and 13 percent in urban), zone (18 percent in South East, South South and 16 percent in North Central), and wealth (19 percent among poor and 13 percent among rich).

Moderate anaemia: Overall, 7 percent of women of reproductive age had moderate anaemia. There was a statistically significant difference in the prevalence of moderate anaemia among women of reproductive age (aged 15-49 years) by residence (9 percent in rural and 4 percent in urban), zone (9 percent in North East and 4 percent in South West) wealth (9 percent among poor and 5 percent among rich), and level of education completed (12 percent among those with no education and 4 percent among those with post-secondary education).

Severe anaemia: Severe anaemia was present in 0.6 percent of women of reproductive age nationally. There was a statistically significant difference in the prevalence of severe anaemia among women of reproductive age (aged 15-49 years) by residence (0.8 percent in rural and 0.3 percent in urban), and wealth (1.5 percent among poor and 0.4 percent among rich).

Pregnant women (15-49 years old)

Any anaemia: Anaemia was present in 32 percent of pregnant women nationally. There was a statistically significant difference in the prevalence of any anaemia among pregnant women (aged 15-49 years) between residence (37 percent in rural and 21 percent in urban).

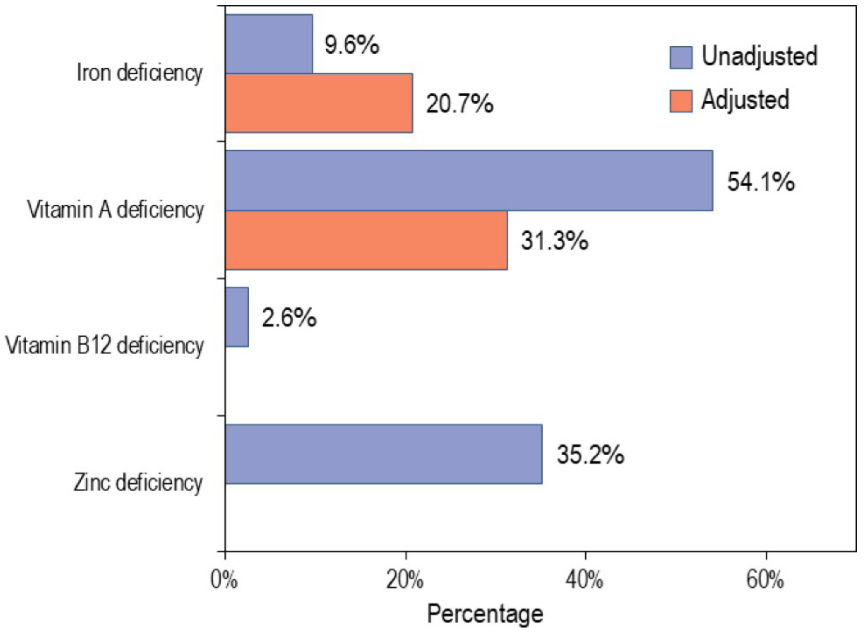
Mild anaemia: Overall, 22 percent of pregnant women had mild anemia. The prevalence of any anemia was higher in pregnant women residing in rural (26 percent) versus urban areas (15 percent).

Moderate anaemia: Only 9 percent of pregnant women had moderate anaemia. There was no significant variation in the prevalence of moderate anaemia among pregnant women (aged 15-49 years) across the background characteristics.

Severe anaemia: Severe anaemia was observed in 0.5 percent of pregnant women. There was no significant variation in the prevalence of severe anaemia among pregnant women (aged 15-49 years) across the background characteristics.

Micronutrient status of children (aged 6-59 months), adolescent girls (10-14 years) and women of reproductive age (15-49 years)

Micronutrient status of children (aged 6-59 months)



Prevalence of micronutrient deficiencies for children (aged 6-59 months), Nigeria 2021

Iron deficiency and iron deficiency anaemia: Nationally, the unadjusted prevalence of iron deficiency in children (aged 6-59 months) was 10 percent, while the adjusted prevalence was 21 percent and significantly different by age (36 percent in 12-23 months and 8 percent in 48-59 months), zone (28 percent in North East and 9 percent in South South), and level of education completed by caregiver (27 percent among those with no education and 18 percent among those with tertiary education). There was a statistically significant difference in the percentage of children (aged 6-59 months) with iron deficiency anemia by age (17 percent among 12-23 months and 1 percent among 48-59 months), zone (13 percent in North West and 4 percent in South South), and wealth (11 percent among poor and 6 percent among rich).

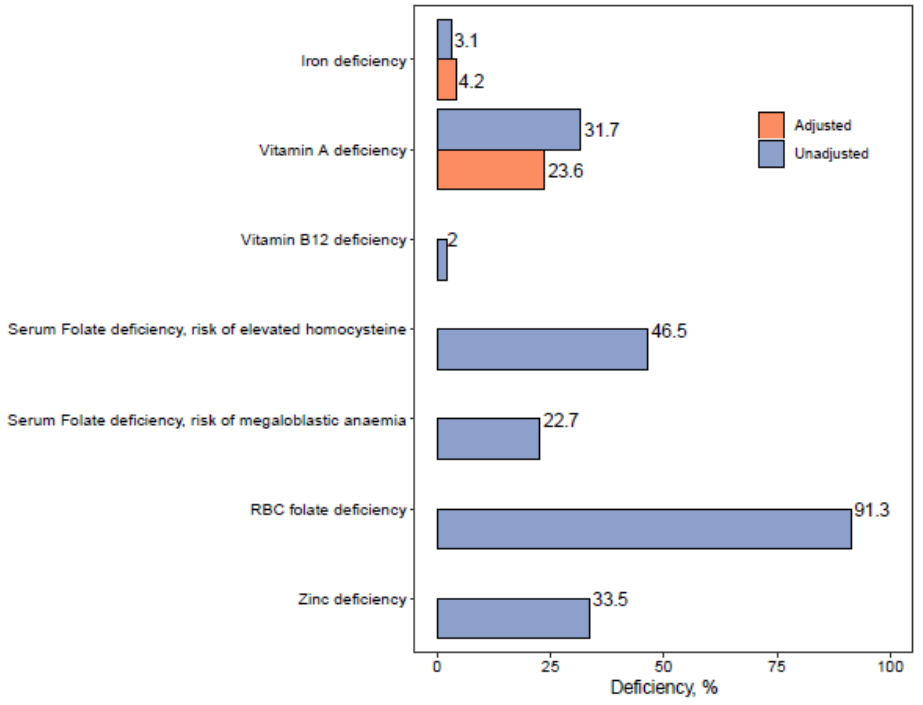
Vitamin A: Nationally, the unadjusted prevalence of vitamin A deficiency in children (aged 6-59 months) was 54 percent, while the adjusted prevalence was 31 percent. Significant differences were observed based on serum retinol for age (34 percent among 36-47 months and 24 percent among 6-11 months), sex (34 percent among males and 29 percent among females), residence (34 percent in rural and 26 percent in urban), zone (51 percent in North West and 6 percent in South East), wealth (40 percent among poor and 21 percent among rich) and level of education completed by caregiver (37 percent among those with no education and 22 percent among those

with tertiary education). In addition, there was a statistically significant difference in the percentage of children (aged 6-59 months) with vitamin A deficiency based on MRDR by age (3 percent among 24-35 months and 0.2 percent among 48-59 months) and residence (1.8 percent in rural and 0.1 percent in urban).

Vitamin B12: Nationally, vitamin B12 deficiency in children (aged 6-59 months) was low (3 percent). There was a statistically significant difference in the percentage of children with vitamin B12 insufficiency (<220 pmol/L) by age (23 percent among 6-11 months and 9 percent among 36-47 months), residence (17 percent in rural and 4 percent in urban), zone (19 percent in North West, North East and 1 percent in South South), wealth (24 percent among poor and 2 percent among rich) and level of education completed by caregiver (19 percent among those with no education and 5 percent among those with tertiary education). Similarly, there were significant differences in children with vitamin B12 deficiency (at risk of megaloblastic anaemia) and defined as serum B12 concentration <148 pmol/L) by age category (8 percent among 6-11 months and 1 percent among 36-47 months), residence (4 percent in rural and 0.1 percent in urban), zone (5 percent in North West and 0 percent in South West), wealth (6 percent among poor and 0.2 percent among rich), and level of education completed by caregiver (4 percent among those with no education and 0.5 percent among those with tertiary education).

Zinc deficiency: Nationally, zinc deficiency in children (aged 6-59 months) was 35.2 percent. There was a statistically significant difference in the percentage of children (aged 6-59 months) with zinc deficiency between residence (41 percent in rural and 24 percent in urban), zone (57 percent in North West and 12 percent in South East), wealth (45 percent among poor and 23 percent among rich) and level of education completed by caregiver (42 percent among those with no education and 20 percent among those with tertiary education).

Micronutrient status of adolescent girls (aged 10-14 years)



Prevalence of micronutrient deficiencies among adolescent girls (aged 10-14 years), Nigeria 2021

Iron deficiency and iron deficiency anaemia: The unadjusted prevalence of iron deficiency in adolescent girls (aged 10- 14 years) was 3 percent, while the adjusted prevalence was 4 percent. There was no significant variation in the percentage of adolescent girls with iron deficiency anemia across the background characteristics.

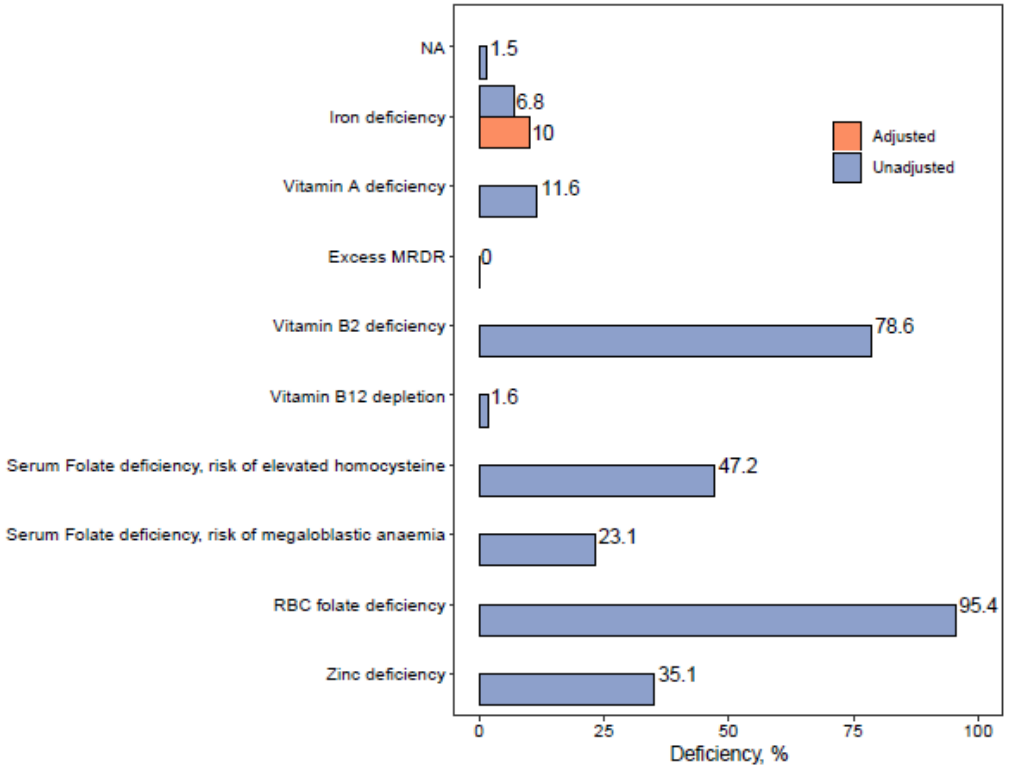
Vitamin A: The unadjusted prevalence of vitamin A deficiency in adolescent girls (aged 10-14 years) was 32 percent, while the adjusted prevalence was 24 percent. There was a statistically significant difference in the percentage of adolescent girls (aged 10-14 years) with vitamin A deficiency between wealth quintiles (37 percent among poor and 11 percent among rich).

Vitamin B12: The prevalence of vitamin B12 deficiency was low (2 percent). Significant differences in vitamin B12 insufficiency were observed for residence (11 percent rural and 2 percent urban) and wealth (13 percent among poor and 2 percent among rich) and by residence (3 percent in rural and 0.3 percent in urban) for vitamin B12 deficiency.

Zinc: The percentage of adolescent girls (aged 10-14 years) with zinc deficiency was 34 percent nationally. Significant differences in the percentage of adolescent girls (aged 10-14 years), with zinc deficiency were observed for residence (41 percent in rural and 23 percent in urban), and wealth (43 percent among poor and 20 percent among the rich).

Folate: The percentage of adolescent girls with folate deficiency based on analysis of whole blood lysate (Red Blood Cell folate) was 91 percent. There was no significant variation in the percentage of adolescent girls with RBC folate deficiency across the background characteristics. In addition, there was no significant variation in the percentage of adolescent girls with serum folate deficiency at risk of elevated homocysteine or risk of megaloblastic anaemia across the background characteristics.

Micronutrient status of women of reproductive age (aged 15-49 years)



Prevalence of micronutrient deficiencies among women of reproductive age (aged 15-49 years), Nigeria 2021

Iron deficiency and iron deficiency anaemia: The unadjusted prevalence of iron deficiency in women of reproductive age (aged 15-49 years) was 7 percent, while the adjusted prevalence was 10 percent. There was a statistically significant difference in the percentage of women of reproductive age (aged 15-49 years), with iron deficiency between zone (16 percent in North East and 5 percent in South West), wealth quintiles (8 percent among poor and 13 percent among rich), and use of iron/ folic acid supplement in the last 7 days prior to the survey (7 percent among those who used supplement and 10 percent among those who did not use it). There was a statistically significant difference in the percentage of women of reproductive age (aged 15-49 years), with iron deficiency anemia between zone (6 percent in North East and 2 percent in South West).

Vitamin A: 12 percent of women of reproductive age (aged 15-49 years) were vitamin A deficient based on serum retinol, while the prevalence based on Modified Relative Dose Response (MRDR) was 0 percent. There was a statistically significant difference in the percentage of women of reproductive age (aged 15-49 years) with vitamin A deficiency based on serum retinol by residence (15 percent in rural and 7 percent in urban), zone (22 percent in North West and 3 percent in South East), wealth (19 percent among poor and 5 percent among rich), level of education completed (15 percent among those with no education and 5 percent among those who completed post-secondary education), and use of multivitamin supplement in the last 6 months prior to the survey (12 percent among non-users and 8 percent among users). There was no significant variation in the prevalence of vitamin A deficiency based on MRDR among women of reproductive age (aged 15-49 years) across the background characteristics.

Vitamin B12: The prevalence of vitamin B12 deficiency was low (2 percent). Significant differences in the percentage of women of reproductive age (aged 15-49 years) with vitamin B12 insufficiency were observed between residence (14 percent rural and 3 percent urban), zone (21 percent in the North East and 0.5 percent in South West), wealth (19 percent among poor and 1 percent among rich), level of education completed (19 percent among those with no education and 2 percent among those with pose secondary education), and use of the multivitamin supplement in the last 6 months prior to the survey 10 percent among those who did not use and 5 percent among those who used a multivitamin supplement).

There was a significant difference in the percentage of women of reproductive age (aged 15-49 years) with vitamin B12 deficiency between residence (2 percent in rural and 0.6 percent in urban), zone (4 percent in North East and 0 percent in South West), wealth (4 percent among poor and 02 percent among rich), and level of education completed (4 percent among those with no education and 0.2 percent among those with post-secondary education).

Zinc: 35 percent of women of reproductive age were zinc deficient nationally. There was a statistically significant difference in the percentage of women of reproductive age (aged 15-49 years) with zinc deficiency between age categories (38 percent among 20-29 years and 34 percent among 40-49 years), residence (41 percent in rural and 27 percent in urban), zone (60 percent in North West and 16 percent in South East), wealth (49 percent among poor and 25 percent among rich), level of education completed (49 percent among those with no education and 23 percent among those with post-secondary education), and use of multivitamin supplement in the last 6 months prior to the survey (36 percent among those who did not use and 27 percent among those who used a multivitamin supplement).

Folate: The prevalence of folate deficiency based on analysis of serum folate was 47 percent for the risk of elevated homocysteine and 23 percent for the risk of megaloblastic anaemia. There was no significant variation in the percentage of women of reproductive age with serum folate deficiency at risk of elevated homocysteine and megaloblastic anaemia across the background characteristics. Folate deficiency based on analysis of whole blood lysate (Red Blood Cell folate) was 95 percent.

There were significant differences in the percentage of women of reproductive age (aged 15-49 years) with RBC folate insufficiency (RBC folate concentration <748 nmol/L) by age (97 percent among 15-19 years and 94 percent among 40-49), residence (97 percent in rural and 94 percent in urban), zone (99 percent in North East, North West and 87 percent in South West), wealth (99 percent among poor and 93 percent among rich), level of education completed (99 percent among those with no education and 92 percent among those who completed post-secondary education), and use of iron/folic acid supplement in the last 6 months prior to the survey (91 percent among those who used and 96 percent among those who did not use).

In addition, there was a significant difference in the percentage of women of reproductive age (aged 15-49 years) with RBC folate deficiency (RBC folate concentration <624 nmol/L) between residence (94 percent in rural and 88 percent in urban), zone (98 percent in North East and 77 percent in South West), wealth (97 percent among poor and 85 percent among rich), level of education completed (97 percent among those with no education and 82 percent among those who completed post-secondary education), and use of iron/folic acid supplement in the last 6 months prior to the survey (83 percent among those who used and 93 percent among those who did not use).

Vitamin B1: The percentage of women of reproductive age (aged 15-49 years) at high risk of vitamin B1 deficiency was 2 percent. There was a statistically significant difference in the percentage of women of reproductive age (aged 15-49 years) who are at low risk and moderate risk of vitamin B1 deficiency by the level of education completed (75 percent among those with no education and 83 percent among those who completed post-secondary education for low risk), and those at moderate risk (23 percent among those with no education and 16 percent among those who completed post-secondary education for moderate risk). There was no significant variation in the prevalence of high-risk of vitamin B1 deficiency among women of reproductive age (aged 15-49 years) across the background characteristics.

Vitamin B2: *The prevalence* of vitamin B2 deficiency was 79 percent. There was a statistically significant difference in the prevalence of vitamin B2 deficiency among women of reproductive age (aged 15-49 years) between residence (82 percent in rural and 74 percent in urban), and level of education completed (85 percent among those with no education and 67 percent among those who completed post-secondary education).

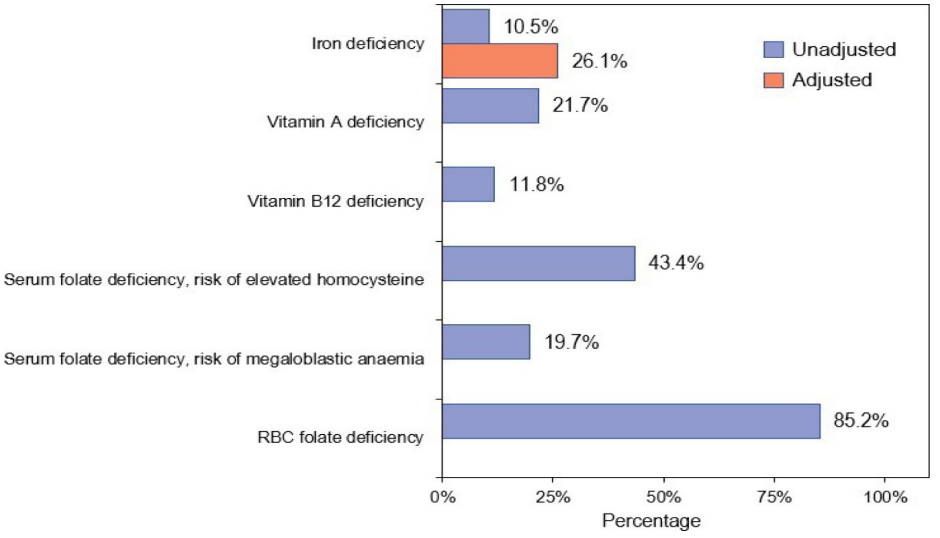
Iodine

Non-lactating women of reproductive age (aged 15-49 years): Overall the iodine intake was fine (100-300 ug/L) or high (> 300 ug/L) in some strata, the median urinary iodine was 292.7 µg/L and differed by age (337 µg/L among 15-19 years and 263 µg/L among 40-49 years), residence (258 µg/L in rural and 332 µg/L in urban), zone (423 µg/L in South West and 248 µg/L in North West), wealth (234 µg/L among poor and 346 µg/L among rich), and level of education completed (240 µg/L among those with no education and 316 µg/L among those who completed post-secondary education).

Lactating women of reproductive age (aged 15-49 years): The overall median level of urinary iodine among lactating women of reproductive age (aged15-49 years) was 217.6 µg/L. This value suggests that the iodine intake was fine considering that around half of the iodine goes to urine and the other has to breastmilk. There was a statistically significant difference in the urinary iodine concentrations of lactating women of reproductive age (aged 15-49 years) by age (279 µg/L among 15-19 years and 190 µg/L among 40-49 years), residence (261 µg/L in urban and 202 µg/L in rural), zone (163 µg/L in North West and 372 µg/L in South West), wealth (180 µg/L among poor and 282 µg/L among rich), and level of education completed (182 µg/L among those with no education and 314 µg/L among those with post-secondary education).

Pregnant women (15-49 years old): The overall median level of urinary iodine among pregnant women was 237.5 µg/L, which is evidence of appropriate iodine intake. There was a significant difference in the urinary iodine concentrations of pregnant women (aged 15-49 years) by wealth (277 µg/L among the rich and 185 µg/L among the poor), but in the two cases it was fine..

Micronutrient status of pregnant women (aged 15-49 years)



Prevalence of micronutrient deficiencies among women of reproductive age (WRA, aged 15-49 years), Nigeria 2021.

Iron deficiency and iron deficiency anaemia: The unadjusted prevalence of iron deficiency in pregnant women (aged 15-49 years) was about 11 percent, while the adjusted prevalence was about 26 percent. There was no significant variation in the percentage of pregnant women (aged 15-49 years) with iron deficiency or with iron deficiency anemia across the background characteristics.

Vitamin A: The prevalence of vitamin A deficiency in pregnant women (aged 15-49 years) based on serum retinol was 22 percent. There was no significant variation in the percentage of pregnant women (aged 15-49 years) with vitamin A deficiency across the background characteristics.

Vitamin B12: The prevalence of vitamin B12 deficiency was 12 percent. Vitamin B12 insufficiency: There was a statistically significant difference in the percentage of pregnant women (aged 15-49 years) with vitamin B12 insufficiency between age categories (46 percent in 15-19 years and 5 percent in 40-49 years), residence (40 percent in rural and 17 percent in urban), wealth (52 percent among poor and 10 percent among rich), and level of education completed 47 percent among those with no education and 10 percent among those with post-secondary education).

Similarly, significant differences in the percentage of pregnant women (aged 15-49 years) with vitamin B12 deficiency were observed for age (18 percent among 30-39 years and 4 percent among 40-49 years), residence (16 percent in rural and 4 percent in urban), wealth (24 percent among poor and 2 percent among rich), and level of education completed (23 percent among those with no education and 2 percent among those with post-secondary education).

Folate: The prevalence of folate deficiency based on analysis of whole blood lysate (Red Blood Cell folate) was 85 percent, while serum folate deficiency **(**risk of elevated homocysteine**)** was 43 percent and serum folate deficiency **(**risk of megaloblastic anemia**)** was 20 percent. There was a statistically significant difference in the percentage of pregnant women with serum folate deficiency at risk of elevated homocysteine by residence (47 percent in rural and 38 percent in urban).

Similarly, there was a significant difference in the percentage of pregnant women at risk of megaloblastic anaemia by residence (23 percent in rural and 15 percent in urban). There was a statistically significant difference in the percentage of pregnant women (aged 15-49 years) with RBC folate deficiency by residence (89 percent in rural and 77 percent in urban), wealth (93 percent among poor 70 percent among rich), and level of education completed (95 percent among those with no formal education and 61 percent among those who completed post-secondary education).

Key Drivers of Anaemia

Children (6-59 months old): Iron (41 percent versus 27 percent), zinc (39 percent versus 26 percent), and B12 deficiency (59 percent versus 29 percent) were all associated with a statistically significant increased probability of any anaemia. Children 6-59 months with chronic inflammation (40 percent versus 17 percent), acute inflammation (50 percent versus 22 percent), helminth (38 percent versus 26 percent) and malaria infection (52 percent versus 24 percent) were all associated with a statistically significant increase in any anaemia.

Adolescent girls (10-14 years old): Iron deficiency was the only nutrient associated with a statistically significant increased prevalence of any anaemia (37 percent versus 19 percent); Moderate anaemia was higher among adolescent girls with acute (15 percent versus 5 percent) and chronic (14 percent versus 4 percent) inflammation; and higher moderate and severe anaemia among adolescent girls with malaria infection (11 percent versus 4 percent and 2 percent versus 0 percent, respectively.

Women of reproductive age (15-49 years old): The key nutrient deficiencies associated with an increased probability of any anaemia among women of reproductive age were iron (44 percent versus 21 percent), vitamin A (34 percent versus 22 percent), zinc (30 percent versus 20 percent) and folate (23.9 percent versus 17 percent). Regarding non-nutritional factors associated with anaemia, the prevalence of any anaemia was higher among women of reproductive age with acute and chronic inflammation compared to those without inflammation (32 percent versus 22 percent and 30 percent versus 22 percent, respectively), and with those with malaria than those without malaria (29 percent versus 22 percent).

Pregnant women (15-49 years old): The nutrient deficiencies associated with a statistically significant increased probability of any anaemia were iron (39 percent versus 28 percent) and vitamin A (48 percent versus 27 percent).

Strength of association between any anemia, micronutrient deficiencies and select risk factors: Iron deficiency was associated with anaemia in all target groups (2.12 and 1.90 times higher in WRA and Adolescent girls respectively). Among women of reproductive age, vitamin A, zinc and folic acid deficiency were also associated with a higher prevalence of anemia (1.54, 1.47 and 1.38 higher prevalence), while zinc and vitamin B12 deficiency were also all higher children 6-59 months with anemia (1.51 and 2.02 higher), and vitamin A was 1.81 times higher among pregnant women with anemia. Having sickle cell disease was clearly associated with anemia among both WRA and children 6-59 months (4.36 and 3.26 times higher) while having an Hb trait as a genetic blood disorder was also linked to anemia.

Key factors associated with multiple forms of malnutrition.

Children (6-59 months old): Prevalence of stunting, wasting, underweight, overweight, and obesity are significantly higher among children with iron, vitamin A, zinc, and vitamin B12 deficiencies. Both acute and chronic inflammations are also significantly related to all malnutrition indicators. The results indicate that the prevalence of all five malnutrition indicators is almost the same across all three categories of food insecurity and is not significant.

Adolescent girls (10-14 years old): Although not significantly different, the prevalence of stunting and thinness is higher among moderately and severely food insecure adolescent girls 10-14 years old, Vitamin A deficiency is related to the prevalence of stunting, overweight, and obesity. Zinc deficiency, on the other hand, is strongly related to stunting among girls.

Women of reproductive age (15-49 years old): Prevalence of thinness is higher among both, moderately and severely food-insecure women and is significant. Prevalence of obesity and overweight are higher among food-secure women; however, the results are not statistically different . Vitamin A, zinc, and RBC folate deficiencies are strongly associated with all indicators of malnutrition in women of reproductive age (thinness, overweight, obesity) except vitamin A deficiency in overweight women. Acute and chronic inflammations are strongly associated with overweight and obese women.

Recommendations for Nutrition Policy in Nigeria

Thematic Area	Major Finding	Implication	Call to action
Nutrient Intake inadequacy	The contribution of animal-sourced protein is low and at least >30% of women did not meet protein intake requirements.	Overall diet (of women and children) is likely limited in essential amino acids critical for growth and development.	Food system innovations are needed to incentivize the production and consumption of animal-based protein foods. Specifically, a scale out of relevant policies such as policy recommendations on the Transformation and Future of Aquatic Food Systems in Nigeria is needed urgently.
	Above 50% inadequacy in women's intake of Calcium, Vitamin C, B1, B2, Folate, and Vitamin B12. Inadequacy of between 25% - 50% in intake of Iron, Zinc, Vitamin A	Food-related micronutrient inadequacy is still a problem and is more severe among women (especially in pregnant and lactating women)	Existing policy strategies such as the Agricultural Sector Food Security and Nutrition Strategy need to be strengthened to fulfill all its strategic objectives which include "to reduce undernutrition, including, micronutrient deficiency disorders" Food-based and food system policies such as supplementation and fortification that are proven to improve micronutrient intake need to be scaled up and sustained.
	Severe inadequacy of >50% in the children's intake of Calcium, Vitamin B2, Folate, and Vitamin B12 with lesser severity in the intake of Iron, Zinc, Vitamin A, and B1		

IYCF	Frequency of meals was generally within recommendations for most children but dietary diversity was lower resulting in 41% attaining minimum acceptable diet	Nutrient adequacy of food consumption is currently sub-optimal	There is need for an urgent adaptation and scale-up of health-related priority actions for Nigeria's food systems transformation. This includes the integration of food-based dietary guidelines and standardized nutrition education messages into service delivery at all levels This will improve nutrition education toward achieving dietary diversity for children
	Consumption of Sweet beverages and unhealthy foods was higher among children in urban areas	Dietary patterns are likely becoming unhealthy among children living in urban areas	Food environment policies that can drive and protect healthy consumption patterns are needed
Biofortification	Only three percent consumed yellow cassava, five percent consumed orange-fleshed sweet potato and 13 percent consumed orange maize. Consumption was highest in the North East compared to all other zones in the country.	Nutritious foods capable of reducing the burden of micronutrient deficiencies, especially Vitamin A deficiency are not reaching the targeted population substantially. There are still opportunities for scaling up especially in areas where industrial manufactured foods have a low reach and the analogous crops are still main staples.	Provide enabling environment suitable for scaling up the production and consumption of biofortified crops especially in areas experiencing high micronutrient deficiency.

Fortification	Consumption of fortifiable and fortified foods was higher for items that are usually utilized as ingredients in households (vegetable oil, sugar, salt, and bouillon) when compared to the flours that are consumed in higher quantity (wheat flour maize flour, and semolina flour).	Flours and staples that could deliver more nutrients to the overall nutrient intake of the population are less utilized in quantity compared to food vehicles that serve as ingredients.	Strengthen existing policies and create innovative policies that improve mandatory large-scale food fortification, especially for staples.
	Despite high utilization of Coverage of fortification is low for flours, especially in Northern zones	Coverage of fortification is low among zones in the northern part of the country	Context-specific innovations are needed in low-fortification coverage areas
Diet Quality	Mean Minimum dietary diversity score of women in Nigeria is 3.6 out of a possible score of 10. Only a fifth of non-pregnant and a third of pregnant women achieved minimum dietary diversity (consumed at least 5 from 10 food groups).	Dietary diversity is still low for sustaining micronutrient adequacy in women	Based on recommendations of consultations by several food system dialogues, food system transformation pathways that suit the Nigerian context are recommended for urgent adaptation to incentivize the increased production and consumption of nutrient-dense foods in addition to known staples. Specifically, there should be an expansion in nutrition education programmes to encourage the general population to consume nutrient rich and diverse diets, fortified/bio fortified foods, and reduce food waste at the household level. It is also recommended that quantitative food-based dietary guidelines be developed for informed nutrition education.

Anthropometry	The data indicate that stunting affects 1 in 3 children aged 6-59 months nationally but some zones are more affected than others.	Although country-level estimates are useful for international comparisons and benchmarking, they mask disparities in malnutrition at the lower administrative levels at which most health and nutrition policy planning and implementation occur.	Geospatial estimates of malnutrition provided by the survey provide a baseline for measuring progress and should be used for prioritization and targeting interventions to those populations with the greatest need, in order to reduce disparities and accelerate progress.
	The prevalence of obesity is in double digits among women of reproductive age in certain zones.	The data reveal obesity as a critical and emerging issues in Nigeria	There is a need to develop comprehensive plans that tackle both undernutrition and overnutrition across different age groups and geopolitical zones.
Coverage of nutrition interventions to improve nutrition status	The results reveal low coverage of key nutrition interventions and an even lower co-coverage of these interventions.	Improved implementation and coverage of essential nutrition interventions and services is needed across different population groups to enhance overall nutritional status and maternal-child health.	A better understanding of implementation science is needed to address implementation bottlenecks in order to strengthen programmatic coverage, quality and impact of nutrition interventions.
Malaria, Helicobacter pylori (H. pylori), helminths, elevated plasma glucose, and elevated glycated haemoglobin (Hba1c)	Morbidities are an important public health issues in Nigeria, with H. pylori infection being widespread.	These findings underscore the importance of targeted interventions and healthcare strategies to address the high prevalence of these health conditions among specific populations.	There is a need to investigate the high prevalence of H. pylori observed as well as public health communication programs that include prediabetes testing in risk populations.

Anemia & Iron deficiency anaemia	The prevalence of anemia and iron deficiency anemia are lower than expected	The data are evidence of steady progress on an issue long thought intractable	Efforts to further reduce anemia are warranted. Documentation of what works, for whom, where, when, why and how is needed to extend transferable principles to other intervention programs.
Iodine	The levels of urinary iodine observed in pregnant and non-pregnant women of reproductive age are fine or above recommended intakes.	Suspected high intake of iodine needs to be explored and addressed, and the impact of other interventions supplying iodine (as for example MMS) to be assessed for unintended negative consequences.	There is a need to conduct a smaller longitudinal study to document use and intake of iodine fortified products and micronutrient supplements as the findings will have implications for the levels of iodine in fortification programs and fortifiable food vehicles, as well as the introduction of other interventions.
Micronutrient status	The National Food Consumption and Micronutrient Survey 2021 is the most comprehensive micronutrient survey in Africa, and presents a comprehensive picture of specific micronutrient deficiencies of public health importance, the co-existence of micronutrient deficiencies, and emerging issues of public health importance.	The data reveal a high prevalence of folate deficiency among adolescent girls, and pregnant and non-pregnant women of reproductive age.	There is a need for agri-food system interventions and innovations to address the deficiencies observed, especially for folate and zinc.
Key drivers of anaemia	Micronutrient deficiencies, infections and inflammation (acute and chronic), and genetic blood disorders were associated with an increased probability of any anaemia in all population groups. Iron deficiency was associated with anemia in all target groups but in a lower proportion than 50%.	The results provide important insights into the key drivers of anaemia.	There is need to understand the extent of the relative contribution of each risk factor to better inform the design of anaemia reduction efforts to maximize public health impact.

Survey Limitations

- Lack of making inferences at the state level
- Design with a focus on micronutrients rather than food consumption—nutrient needs vary by age
- Household questionnaire not inclusive of some important characteristics since it is a population survey
- Group level analysis and not at the individual level, thus difficult to determine associations and relationships

NFCMS Collaborating Institutions

The 2021 National Food Consumption and Micronutrient Survey is a project of the FGoN and the implementation was led by the International Institute of Tropical Agriculture (IITA), in collaboration with the following organizations:

Federal Ministry of Health and Social Welfare (FMOHSW)
Federal Ministry of Agriculture and Food Security (FMAFS)
Federal Ministry of Budget, and Economic Planning (FMBEP)
National Population Commission, Nigeria (NPC)
National Bureau of Statistics, Nigeria (NBS)
United Nations Children's Fund (UNICEF)
Tufts University- International Dietary Data Expansion Project (INDDEX)
FHI 360 Solutions-*Intake* Center for Dietary Assessment
Oxford Policy Management (OPM)
Food and Agriculture Organization of the United Nations (FAO)
University of Ibadan
University of Calabar
University of Wisconsin-Madison, USA Cornell University, USA
Gates Foundation
World Bank

Donor Support and Disclaimer

This project was supported by the Federal Ministry of Health and Social Welfare through the World Bank supported Nutrition Division ANRIN Project, under the cooperative agreement # NG-ND, FMOH-127145-CS-CDS/01, and the Gates Foundation, United Nations Children's Fund, and Foreign, Commonwealth & Development Office under the cooperative agreement # NIWPCA2020240/PD2020200, United States Agency for International Development, Nutrition International under the cooperative agreement # 10-2097-INTINS-01, and Federal Ministry of Agriculture and Food Security. The findings and conclusions of this report are those of the authors and do not necessarily represent the official position of the funding agencies.

Contact Information

Information about the NFCMS 2021 may be obtained from the headquarters of the Federal Ministries of Health and Social Welfare and Agriculture and Food Security, Nutrition Divisions, Abuja, Nigeria.

Additional information about the NFCMS 2021 may be obtained from the International Institute of Tropical Agriculture, Oyo Road, Ibadan, Nigeria (telephone: +234-803-4035281; fax: +44-208-7113786; email: iita@cgiar.org; internet: www.iita.org).

Members of the NFCMS Steering Committee (SC)

S/N	Institution	Name
1	Ministry of Budget, and Economic Planning	Dr. Sanjo Faniran
2	Ministry of Budget, and Economic Planning	Mrs. Nelson Chito
3	Federal Ministry of Health and Social Welfare	Dr. Salma Anas Kolo
4	Federal Ministry of Health and Social Welfare	Dr. Boladale Alonge
5	Federal Ministry of Health and Social Welfare	Dr Binyerem Ukaire
6	Federal Ministry of Health and Social Wefare	Mrs Ladidi Bako-Aiyegbusi
7	Federal Ministry of Agriculture and Food Security	Mrs Sugra Mahmood
8	Federal Ministry of Agriculture and Food Security	Dr Rasaq Oyeleke
9	International Institute of Tropical Agriculture	Dr. Isiaka Olarewaju
10	National Bureau of Statistics	Mr. Imeh Udoabah
11	International Institute of Tropical Agriculture	Mr. Kolapo Usman
12	National Population Commission	Mrs. Titilayo Tawa
13	Gates Foundation	Dr Caroline Jehu-Appiah
14	Gates Foundation	Dr. Jonathan Gorstein
15	Dangote Foundation	Dr. Francis Aminu
16	European Union	Dr. Anthony Ayeke
17	World Bank	Dr. Ritgak Asabe Sarah Dimka
18	World Bank	Mr Eubert Rufurunesu Vushoma
19	World Bank	Mr Kamal Adamu Ibrahim
20	United States Agency for International Development	Dr Laurel Rushton
21	United States Agency for International Development	Mr. Ebenezer Oluloto
22	Foreign, Commonwealth & Development Office	Mr. Diego Moroso
23	International Institute of Tropical Agriculture	Dr. Kenton Dashiell
24	United Nations Children's Fund	Ms. Nemat Hajeebhoy
25	United Nations Children's Fund	Mr. Edward Kutondo
26	Global Alliance for Improved Nutrition	Dr. Michael Ojo
27	FMAFS/GAIN	Dr. Adeyinka Onabolu

Members of the NFCMS Technical Advisory Committee (TAC)

S/N	Institution	Name
1	National Population Commission	Mrs. Titilayo Tawa
2	Federal Ministry of Health and Social Welfare	Mrs Ladidi Bako-Aiyegbusi
3	Federal Ministry of Health and Social Welfare	Dr Binyerem Ukaire
4	Federal Ministry of Health and Social Welfare	Dr. Maria Odey
5	Federal Ministry of Agriculture and Food Security	Mrs Sugra Mahmood
6	Federal Ministry of Agriculture & Food Security	Dr Rasaq Oyeleke
7	Ministry of Budget, and Economic Planning	Dr Sanjo Faniran
8	Ministry of Budget, and Economic Planning	Mrs. Nelson Chito
9	University of Calabar	Prof. Henrietta Ene-Obong
10	University of Ibadan	Prof. Rasaki Ajani Sanusi
11	Ahmadu Bello University	Dr. Muyiwa Owolabi
12	Usman Danfodiyo University, Sokoto	Dr. Shafa'atu Giwa Ibrahim
13	Usman Danfodiyo University, Sokoto	Prof. Rabi'u Umar Aliyu
14	Dangote Foundation	Dr. Francis Aminu
14	Gates Foundation	Dr. Jonathan Gorstein
15	World Bank	Dr. Ritgak Asabe Sarah Dimka
16	World Bank	Eubert Rufurunesu Vushoma
17	World Bank	Mr Kamal Adamu Ibrahim
18	FHI 360 Solutions-*Intake* Center for Dietary Assessment	Dr. Megan Deitchler
19	FHI 360 Solutions-*Intake* Center for Dietary Assessment	Dr. Marieke Vossenaar
20	FHI 360 Solutions-*Intake* Center for Dietary Assessment	Dr. Joanne Arsenault
21	UNICEF	Mrs Hanifa Namusoke
22	UNICEF	Mr Edward Kutondo
23	FCDO	Mr. Diego Morosso
24	IITA	Dr. Busie Maziya-Dixon
25	IITA	Mr. Kolapo Usman
26	IITA	Dr. Mercy Gloria Lungaho
27	IITA	Dr. Isiaka Olarewaju
28	IITA	Mr. Samuel Ofodile
29	Nutrition International	Mrs Titilola Abolade
30	National Bureau of Statistics	Mr. Imeh Udoabah
31	OPM	Femi Adegoke
32	OPM	Babatunde Akano
33	FMARD/GAIN	Dr Adeyinka Onabolu

Members of the NFCMS Implementation Working Group (IWG)

S/N	Institution	Name
1	National Population Commission	Mrs. Titilayo Tawa
2	Federal Ministry of Health and Social Welfare	Dr. Binyerem Ukaire
3	Federal Ministry of Health and Social Welfare	Dr. Maria Odey
4	Federal Ministry of Agriculture and Food Security	Mrs Sugra Mahmood
5	Ministry of Budget, and Economic Planning	Mrs. Nelson Chito
6	University of Calabar	Prof. Henrietta Ene-Obong
7	University of Ibadan	Prof. Rasaki Ajani Sanusi
8	Bill and Melinda Gates Foundation	Dr. Jonathan Gorstein
9	World Bank	Dr. Ritgak Asabe Sarah Dimka
10	World Bank	Eubert Rufurunesu Vushoma
11	FHI 360 Solutions-*Intake* Center for Dietary Assessment	Dr. Megan Deitchler
12	FHI 360 Solutions-*Intake* Center for Dietary Assessment	Dr. Mario Chen
13	FHI 360 Solutions-*Intake* Center for Dietary Assessment	Dr. Marieke Vossenaar
14	FHI 360 Solutions-*Intake* Center for Dietary Assessment	Dr. Joanne Arsenault
15	UNICEF	Dr Hanifa Namusoke
16	UNICEF	Mr Edward Kutondo
17	International Institute of Tropical Agriculture	Dr. Busie Maziya-Dixon
18	International Institute of Tropical Agriculture	Dr. Tolu Eyinla
19	International Institute of Tropical Agriculture	Dr. Mercy Gloria Lungaho
20	International Institute of Tropical Agriculture	Mr. Samuel Ofodile
21	International Institute of Tropical Agriculture	Dr. Isiaka Olarewaju
22	International Institute of Tropical Agriculture	Dr. Kolapo Usman
23	Nutrition International	Titilola Abolade
24	National Bureau of Statistics	Mr. Imeh Udoabah
25	Oxford Policy Management (OPM)	Dr. Femi Adegoke
26	Oxford Policy Management (OPM)	Mr. Babatunde Akano
27	FMAFS/GAIN	Dr. Adeyinka Onabolu

Key Survey Personnel

Lead Implementing Agency: International Institute of Tropical Agriculture

Institution	Name	Role
IITA	Dr Busie Maziya-Dixon	Principal Investigator and Overall Survey Coordinator
	Dr Mercy Lung'aho	Anthropometry & Biomarker Lead
	Dr Tolu Eyinla	Dietary Intake Lead Consultant
	Dr Isiaka Olarewaju	Statistician Consultant
	Dr Usman Kolapo	Statistician Consultant
	Mr. Sam Ofodile	Database Manager
University of Ibadan	Prof. Rasaki Ajani Sanusi	Co-Principal Investigator
University of Calabar	Prof. Henrietta Ene-Obong	Co-Principal Investigator
OPM	Dr. Femi Adegoke	Project Manager
	Mr. Babatunde Akano	Database Manager
FHI 360 Solutions- *Intake* Center for Dietary Assessment	Dr Megan Deitchler	Technical Advisor-Dietary Intake
	Dr Marieke Vossenaar	Technical Advisor-Dietary Intake
	Dr Joanne Arsenault	Technical Advisor-Dietary Intake
	Dr Mario Chen	Technical Advisor-Dietary Intake
Tufts University- INDDEX	Dr Jennifer Coates	Technical Advisor-Dietary Intake
	Dr Jerome Some	Technical Advisor-Dietary Intake
	Dr Winnie Fay Bell	Technical Advisor-Dietary Intake
	Dr Sarah Wafa	Technical Advisor-Dietary Intake
University of Wisconsin-Madison	Prof. Sherry Tanumihardjo	Technical Advisor-Biomarker
Cornell University	Prof. Saurabh Mehta	Technical Advisor-Biomarker
National Bureau of Statistics (NBS)	Mr. Udoabah Imeh	Technical Advisor-Survey Design
	Mrs Florence Oke	Technical Advisor-Survey Design
National Population Commission (NPC)	Mrs Titilayo Ahmed	Sensitization and mobilization
Ahmadu Bello University, Zaria	Dr. Muyiwa Owolabi	Zonal Coordinator (NW)
Federal University of Agriculture- Abeokuta	Dr. Catherine Oladoyinbo	Zonal Coordinator (SW)
University of Uyo	Dr. Yetunde Alozie	Zonal Coordinator (SS)

Michael Okpara University of Agriculture	Dr. Patricia Ukegbu	Zonal Coordinator (SE)
Independent Consultants	Mrs. Ladi Williams	Zonal Coordinator (NE)
	Dr. Dolapo Duro	Zonal Coordinator (NC)
Federal Ministry of Health and Social Welfare	Mr. Gabriel Odugbo Ikwulono	Assistant Zonal Coordinator (NC)
Kano State Ministry of Health and Social Welfare	Mr. Abdullahi Yusuf Koki	Assistant Zonal Coordinator (NE)
Jigawa State Ministry of Health and Social Welfare	Mr. Shafi'u Dahiru Gumel	Assistant Zonal Coordinator (NW)
Federal Medical Centre, Abia State	Mr. Ejiofor Agbo	Assistant Zonal Coordinator (SE)
Rivers State University	Dr. Holy Brown	Assistant Zonal Coordinator (SS)
University College Hospital, Ibadan	Dr. Fisayo Ogah	Assistant Zonal Coordinator (SW)