

Beyond Hunger: Unravelling the Malnutrition Crisis in Nigeria

Evuen Uduenevwo Francis, *Omo-Okoroh Mercy Ogheneruno, Odim-Kalu Tobechukwu Valerie,
Godwin Dele Ebiowei, Onosakponome Iruoghene, Okwuenu Prosper Chinyelum and Isoje Abigail Okezi

Department of Biochemistry and Molecular Biology, Dennis Osadebay University, Asaba, Delta State, Nigeria.

*Corresponding authors' email: omo-okoroh.mercy@dou.edu.ng Phone: +2348104069447
ORCID ID: 0009-0005-3226-1832

ABSTRACT

Nigeria, one of the most populous countries in Africa, is among nations with the highest prevalence of child stunting, wasting, and micronutrient deficiencies, as well as increasing diet-related non-communicable diseases and food insecurity among children aged below five years. These coexisting conditions within households reflect malnutrition's paradoxical and multidimensional nature. Although individual studies have focused on specific dimensions of malnutrition, there is a lack of overall synthesis that illustrates the causal pathway between structural determinants, biological mechanisms, and health outcomes. Moreover, heterogeneity in geographic, demographic and methodological characteristics reduces comparability between studies and evidence-based policy making. This review offers a coordinated, integrated examination of four domains of the nutritional crisis in Nigeria: (1) epidemiology of prevalence and distribution; (2) causes by the immediate, underlying and basic determinants framework of the United Nations Children's Fund (UNICEF); (3) consequences on life-course; and (4) evaluation of policy response. Thus, malnutrition is a consequence of entrenched structural inequities, ecological vulnerability and governance failure. Mitigation strategies will involve transformative, multi-sectoral, equity-focused policies that tackle underlying determinants, increase the resilience of households, food systems and health infrastructure, going beyond simply scaling up targeted interventions.

Received: 04 Jun. 2026

Accepted: 14 Aug. 2026

Published: 31 Aug. 2026

Keywords: Malnutrition, Nigeria, Food insecurity, Stunting, Public health

INTRODUCTION

Malnutrition is a critical public health and development issue described as a spectrum ranging from undernutrition (stunting, wasting, underweight) due to micronutrient deficiencies, to overnutrition (overweight and obesity), and the double burden of malnutrition when both occur simultaneously in a population (Muller, 2005). Recent estimates show that stunting, wasting, and underweight rates are about 33%, 12%, and 23%, respectively, for children under five years of age in developing countries, with the highest prevalence in sub-Saharan Africa being 35% for stunting (Seiler *et al.*, 2026). Deficiencies in micronutrients, also known as "hidden hunger", represent a major aspect of malnutrition, affecting 16.32% of children with vitamin A deficiency and 43.41% of children with iodine deficiency in least-developed countries (Dessie *et al.*, 2024).

The 2025 Joint Malnutrition Estimates (JME), jointly produced by UNICEF, WHO and the World Bank, indicate that childhood malnutrition remains a major global public health concern despite progress over the past two decades. The estimates indicate that about 150.2 million children under 5 years of age are stunted worldwide, with impaired linear growth resulting from chronic undernutrition, and 42.8 million of them are wasted (12.2 million severely wasted). These forms of malnutrition are associated with increased risks of mortality, impaired development and adverse health outcomes in childhood and later life (UNICEF, WHO, & World Bank Group, 2025).

A summary of the Joint Malnutrition Estimates of malnutrition of children under five years globally is illustrated in Figure 1.

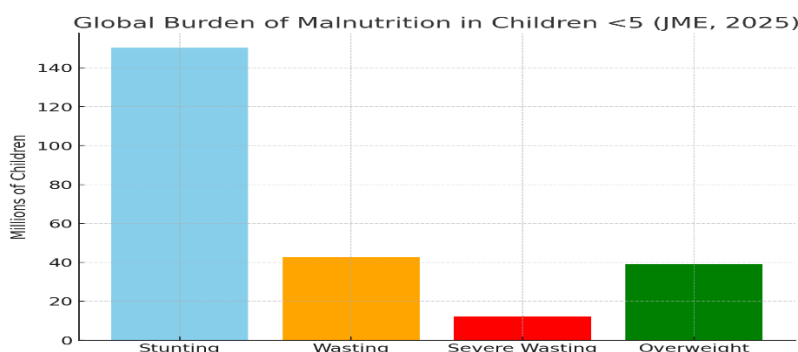


Figure 1: Data on the global burden of malnutrition in children under 5 years of age (UNICEF *et al.*, 2025)

Sub-Saharan Africa is home to a disproportionate burden of malnutrition, making it a critical regional public health emergency. Some of the highest global prevalence of stunting, wasting, and underweight have been reported in the region, with as much as 57.7% of children under five being stunted in some areas, and overweight and obesity are on the rise, especially in urban areas (Ahmed *et al.*, 2023; Omokpariola *et al.*, 2026). This paradox of undernutrition and overnutrition in households and communities highlights the multi-faceted nature of the African malnutrition crisis (Omokpariola *et al.*, 2026). Across the continent, food insecurity continues to be a common phenomenon, compounded by climatic variations, conflict, economic instability and governance issues that affect agri-food system productivity and resilience (Okyere *et al.*, 2024).

Despite being Africa's largest economy and most populous nation, Nigeria continues to record some of the poorest nutritional outcomes globally. Nigeria bears a

disproportionate share of the burden of malnutrition. The country ranks second globally in the number of stunted children, with nearly 32% of children under five affected and about 2 million children suffering from severe acute malnutrition (SAM). Data from the Agricultural Sector Food Security and Nutrition Strategy (2016–2025) indicate that Nigeria contributes at least 5% of the global burden of undernutrition, with over 14 million malnourished children (Federal Ministry of Agriculture and Rural Development (FMARD, 2022). Similarly, findings from the Nigerian Demographic and Health Survey (NDHS) reveal minimal improvement in child nutrition over recent years. In 2018, 37% of children under five were stunted, 7% wasted, 22% underweight, and 2% overweight (NPC, 2019). By 2023–2024, these figures had changed to 40%, 8%, 27%, and 1%, respectively (Federal Ministry of Health and Social Welfare of Nigeria (FMOHSW, 2024), indicating persistent nutritional challenges (Figure 2).

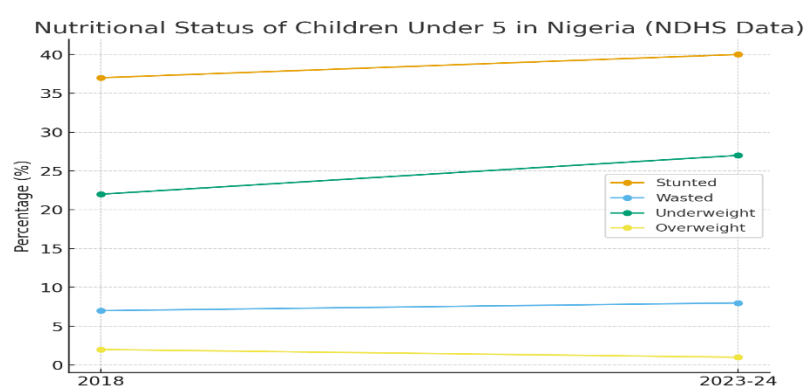


Figure 2: Data on the nutritional status of children under age 5 in Nigeria from 2018 - 2024 (NPC, 2019; FMOHSW, 2024)

An estimated 11 million Nigerian children under five experience severe child food poverty, placing them at high risk of life-threatening malnutrition and related diseases (UNICEF, 2024a). Alarmingly, only a small proportion of affected children receive appropriate treatment. Maternal undernutrition also remains a significant concern, with approximately 7% of women of reproductive age acutely malnourished. Breastfeeding practices remain below recommended standards, with exclusive breastfeeding rates ranging from 17–34%, far below WHO targets (UNICEF, 2025). Regional disparities remain pronounced, with northern Nigeria experiencing significantly higher rates of malnutrition than the southern regions. Among adolescent girls aged 15–19 years, 12% are underweight, 28% are overweight or obese, and approximately 58% are anaemic (Abubakar *et al.*, 2024). Stunting rates in the North-West and North-East exceed 50%, placing these regions among the most severe malnutrition hotspots globally (Amusa *et al.*, 2023; Obasohan *et al.*, 2024). In contrast, urbanization and increased consumption of processed foods in major cities have contributed to rising rates of obesity and overweight, creating what is now described as the “double burden of malnutrition”, the coexistence of undernutrition and overnutrition within the same population (John *et al.*, 2024; Isoje *et al.*, 2026a). The occurrence of these conditions during adolescence adversely affects physical growth, mental development, academic performance, and future productivity while increasing the risk of chronic diseases later in life.

Therefore, this review provides a comprehensive assessment of Nigeria's malnutrition crisis. It begins with an analysis of its distribution and prevalence. It delves deeper into the root

causes and determining factors of malnutrition in Nigeria. Additionally, it evaluates its health, developmental, and socioeconomic consequences on the course of life. Lastly, it evaluates the impact of current policies and interventions and identifies the potential for more integrated and equitable solutions.

Malnutrition Crisis in Nigeria

Despite national and international efforts, Nigeria is not trending towards the realization of Sustainable Development Goal 2 (Zero Hunger by 2030) as more than 30 million Nigerians are affected by acute food insecurity, driven by inflation of food prices, armed conflicts in rural regions, and climate-induced crop failure (Ene-obong *et al.*, 2020; Ukwue, 2025). Nigeria faces a dual burden of malnutrition: undernutrition, manifested through stunting, wasting, and micronutrient deficiencies, and a rising prevalence of overnutrition, which is associated with non-communicable diseases (Obada *et al.*, 2021). This coexistence poses a substantial threat to both health systems and economic development, particularly within sub-Saharan Africa.

Nigeria's undernutrition burden represents both chronic and acute undernutrition, impacting child growth and development. The prevalence of stunting is alarming, ranging from 7.2% in Osun State, Southwest, to 61% in Kaduna State, North Central, and wasting ranges from 1% in Ibadan to 29% in the Federal Capital Territory, while underweight ranges from 5.9% in Osun to 42.6% in Kano (John *et al.*, 2024). These differences highlight the significant geographical inequalities in nutrition, where the nutritional burden is disproportionately high in the northern part of the country.

The continued high rate of these despite Nigeria's enormous land, water and human resource base for food production suggests failures in the food systems, food distribution, and food access mechanisms.

In addition to anthropometric indicators of malnutrition, "hidden hunger" is a vital and frequently overlooked aspect of Nigeria's nutrition challenges. The overall prevalence of anaemia among Nigerian children ranges from 55.2% to 75.1%, with vitamin A deficiency ranging from 5.3% to 67.6%, which is one of the highest disease burdens in the country (Yusuf et al., 2025). Children with these micronutrient deficiencies are at greater risk of impaired immune function, cognitive development, and physical growth, with potential consequences for their health and productivity later in life (Black, 2003). More critically, anthropometric evaluation alone does not fully reflect all forms of nutritional deprivation, as children with normal body size may also have significant micronutrient deficiencies, with the finding that 72.3% of anthropometrically "normal" children in Sokoto State were vitamin A deficient (Musa et al., 2026).

The double burden of malnutrition in Nigeria has become more evident as the prevalence of undernutrition increases in the country alongside the high prevalence of overweight and obesity. In northern Nigeria (Gombe), 11.98% and 16.08% of adolescents are thin and overweight/obese, respectively, while in southern Nigeria (Uyo), 5.3% and 11.27% are, respectively, thin and overweight/obese, suggesting both regional and temporal variations in the nutritional status of adolescents in Nigeria (Wariri et al., 2020). This double burden presents a unique public health problem because under- and overnutrition each has its own type of intervention strategies, and they may be counterproductive, but both must be tackled at the same time among the same populations and households.

Malnutrition is a complex phenomenon with basic, underlying and immediate factors as outlined in the UNICEF definition (UNICEF, 2019). There are underlying and immediate causes including household food insecurity, infant and young child feeding practices, and access to health care, suboptimal living environment, poor nutrition intake and illness (Sablah, 2019). In addition, suboptimal breastfeeding and complementary feeding practices in Nigeria, reflected in low prevalence of early initiation (38%) and exclusive breastfeeding (17%), are major drivers of malnutrition (Oche et al., 2011; NPC, 2014; UNICEF, 2019; WHO, 2021). Other factors influencing food insecurity in Nigeria and other low-income countries which negatively affect nutritional performance include poverty, increasing food prices and vulnerability of the agricultural food system to climate change (Akpogheli et al., 2024; Akinteye et al., 2025; FAO et al., 2025; World Bank, 2025). Furthermore, insecurity and conflict, particularly in the northern regions, have driven millions of people to flee their homes and affected agricultural production, thereby reducing access to health services and contributing to malnutrition (Onwunyi & Anekwe, 2020; Mustafa & Sa'ad, 2025).

Causes and Contributing Factors of Malnutrition in Nigeria

According to the UNICEF malnutrition framework, malnutrition is a multi-level problem at the national, community, household and individual levels (UNICEF, 2019). Moreover, Sablah (2019) reasoned that the causes of malnutrition fall into three main categories:

- i. Basic causes are access to required means including land, education, employment, income and technology.

They also include the broader sociocultural, economic and political environment that impacts on financial, human, physical and social resources.

- ii. Factors that contribute to this are family food insecurity, unhealthy food and nutrition habits, poor forms of childcare and nutrition, and inadequate access to health care services.
- iii. Immediate causes: These are directly related to the person, such as, lack of adequate food intake, illness.

This framework illustrated the multi-sectoral nature of nutrition interventions and interventions targeting factors at all levels are required.

Poor Infant & Young Child Feeding Practices

Food practices for infants and young children (IYCF) are essential for developing healthy children. Ojiako et al. (2025) recommended several IYCF practices, which include commencement of breastfeeding within the first hour of life, exclusive breastfeeding for the first 6 months of life, and provision of children with a minimum dietary standard. In Nigeria, this is not done according to international recommendations. Statistical surveys reveal that only around 38% of babies are breastfed in the first hour after birth and only about 17% are exclusively breastfed for the first 6 months. Although most children are breastfed at some point, the average duration of exclusive breastfeeding is less than one month. Complementary foods are fed to 91% of children from 6 to 23 months and 10% have a minimally adequate diet. Children are unable to receive key nutrients like vitamin A and iron (NPC, 2019; UNICEF, 2019).

Early life malnutrition leads to impaired development of essential organs, such as pancreatic β -cells, and a decrease in insulin secretory function that places the individual at a higher risk for metabolic dysregulation and type 2 diabetes later in life. Such poor feeding practices give rise to a high prevalence of malnutrition. Improving IYCF practices is crucial for reducing malnutrition and promoting healthier futures for Nigerian children (NPC, 2014; FMARD, 2022).

Food Insecurity and Climate Change

Nigeria is a food-insecure nation in spite of its agricultural resources and labour force. Accordingly, with over 70% of the country's labour force in agriculture, but with few agricultural resources, Nigeria remained food insecure. Malnutrition in Nigeria is attributed to food insecurity, with many people and families experiencing a lack of sufficient and healthy food. Although poverty is the root cause of food insecurity in Nigeria, socioeconomic inequalities, poor infrastructure, and environmental issues also aggravate the situation (Ilo et al., 2025). National consumer price index data analyzed in the press highlighted that the inflation rate of food has increased by approximately 170% from 2019 to 2024 (The Guardian Nigeria, 2024). Moreover, there was a positive correlation between the increase in food inflation and malnutrition rates (FAO et al., 2025). Hunger was experienced by an estimated 673 million people in 2024 (estimated 8.2 % of the global population), which was lower than the 8.5 % (8.1 % of the global population) and 8.7 % (8.2 % of the global population) in 2023 and 2022, respectively. This advancement was not uniform around the world, nor was it achieved in all sub-regions of Africa, as hunger continued to increase in most Western Asian and African sub-regions (FAO et al., 2025).

There has been an increase in agricultural household malnutrition from 44.1% in 2010/2011 to 53.4% in 2018/2019, an increase of 9.3 percentage points in eight years (Popoola & Popoola, 2024). This suggests structural

inequities, inadequate food distribution systems, climate vulnerability and governance issues constrain the potential for agricultural production to enhance household nutrition. Remarkably, climate change exacerbates these vulnerabilities, causing a decrease in agricultural output and food security in vulnerable regions in the face of droughts and floods (Agostoni *et al.*, 2023).

Poverty

Poverty contributes significantly to hunger and malnutrition crises in Africa, which have continually plagued the continent. Combined with the COVID-19 pandemic, which has worsened the situation, a combination of several factors, including flawed economic policies, conflict, environmental issues (drought and climate change), rapid population growth, ineffective governance and corruption, has exacerbated the poverty and malnutrition situation in Africa, with many African countries struggling for day-to-day survival (Adeyeye *et al.*, 2023). Nigeria's poverty has worsened: extreme poverty rose from 34.7% in 2018/19 to 41.8% in 2022/2023, with the north far more affected (57.4%) than the south (21.2%). Inequality declined somewhat, but all households experienced a decline in prosperity, and the gap in prosperity expanded. Economic stagnation, inflation, and structural problems have been the bane of the country's growth pattern over the past few years, resulting in a negative impact for the citizens (Ojiako *et al.*, 2025). The high cost of living and low wages have eroded earnings, compounded by the government's decision to end decades of petrol subsidies, which has plunged millions into poverty (Akinteye, 2025). These factors have affected many families, making basic foodstuffs unaffordable, thus further deepening the malnutrition crisis.

Conflict and Insecurity

Recurring communal crises in Nigeria are another setback to the already difficult food security situation, which is also aggravated by the high and unusual prices of staple food items in the markets (FEWS NET, 2025). Conflict between armed groups and government continues to occur in some parts of Nigeria where the majority of the country's agricultural produce is sourced from. The three Northeast states, Yobe, Adamawa, and Borno have recorded more than 2.1 million displaced people, with many of these internally displaced persons (IDPs) experiencing harsh living conditions, with little or no aid provided. The northern region, which has been severely affected by Boko Haram insurgency and banditry, has experienced substantial disruption of agricultural activities, with reported increases in child mortality and cases of severe acute malnutrition in health facilities (Onwunyi & Anekwe, 2020). Ongoing violent conflicts involving armed groups, herders and farmers continue to disrupt agricultural activities in Benue, Plateau and other affected states through the destruction of crops, farmlands and livestock, as well as loss of human lives. These recurring disruptions have led to significant areas of abandoned farmland, decreased agricultural output, food chain disruptions, and livelihood losses, limiting food availability in affected communities (Mustafa & Sa'ad, 2025). With every 1% rise in insecurity, the crop output dropped by 0.21%, while the livestock output dropped by 0.31% (Utobo *et al.*, 2025). Nigeria's food security and nutrition challenges have been worsened by the current conflict, which has affected agricultural production and trade. Furthermore, the closure of various health facilities has left thousands of malnourished children unable to access the necessary treatment, and the other health and nutrition services available have been reduced (FMARD, 2022; Asaju & Kwakano, 2025).

A summary of the causes and contributing factors of malnutrition in Nigeria is illustrated in Figure 3 below.



Source: Adapted from Adesuyi *et al.* (2021), Ilo *et al.* (2025), Obasohan *et al.* (2024), FEWS NET (2024)

Figure 3: Summary of the causes and contributing factors of malnutrition in Nigeria

Consequences of Malnutrition in Nigeria

The consequences of malnutrition in Nigeria include the following:

Increased Childhood Morbidity and Mortality

Childhood malnutrition is a major cause of morbidity and mortality in children under 5 in Nigeria and a major underlying risk factor. Protein–energy malnutrition (PEM) is one of the most visible patterns and is frequently seen as marasmus, kwashiorkor, or marasmic–kwashiorkor, especially in northern Nigeria, where the level of food

insecurity is highest. In situations where there is a limited capacity for nutritional rehabilitation, case fatality rates for severe acute malnutrition (SAM) are higher than the global averages of 5–10%. Severe wasting, oedema, dermatosis and disturbed metabolism are characteristic of these diseases and are often accompanied by high mortality rates if left untreated (WHO, 2023; UNICEF, 2024b).

Micronutrient deficiencies are also highly prevalent. Nigeria's anaemic children under 5 years of age account for approximately 68% of all anaemic children, largely due to

iron deficiency, which causes immune dysfunction and is linked to fatigue, poor intellectual development, and susceptibility to infections (National Demographic and Health Survey, 2023). Vitamin A deficiency is associated with visual impairment (xerophthalmia and night blindness), risk of death from infectious diseases and Zinc deficiency with impaired immune function and increased risk of diarrhoea and pneumonia (Sommer, 1995; WHO, 2023). Essentially, micronutrient deficiencies are very often associated with protein-energy malnutrition, which aggravates immunologic and developmental effects. Often, these deficits are combined, and thus the impact on children's health and development is intensified. The conditions frequently develop without diagnosis in the early phase, leading to risks of health complications in the long run (Elegbeleye *et al.*, 2025).

Increased Susceptibility to Infections

This second pattern is a tight linkage between malnutrition and infectious diseases. Malnutrition has a strong negative impact on immune status and makes affected children more vulnerable to infection and its severity. Children with severe acute malnutrition suffer from dysfunction of their immune system, such as decreased production of immune cells, changed cytokine activity, and a weakened mucosal barrier, making them more susceptible to infections like malaria, diarrhoeal diseases, and acute respiratory infections, which are some of the major causes of child mortality in Nigeria (WHO, 2023; UNICEF, 2024b). This immunosuppression creates a synergistic relationship between malnutrition and infection, where each condition exacerbates the other. For example, recurrent diarrhoea causes loss of nutrients, malabsorption and reduced appetite, thus compromising nutritional status. On the other hand, children who are malnourished have weaker physiological defenses and suffer from longer and more intense infections (Guerrant *et al.*, 2013). Zinc deficiency extends the duration of diarrhoea, and vitamin A deficiency increases the severity of measles and other infectious diseases (WHO, 2023). Recurrent infections and lengthy recovery periods are common when children suffer from malnutrition and are especially prevalent in those who have experienced severe malnutrition. This cyclical relationship serves as a driver and an outcome of the burden of infectious diseases in Nigeria, which is linked to malnutrition (MSF, 2025).

Long-Term Effects on Growth and Cognitive Development

In addition to the acute burden of malnutrition in Nigerian children, the impact of malnutrition is felt in the long-term developmental and physiological effects. Vulnerability to infections and a lower level of cognitive development and productivity later in life are linked to chronic undernutrition, including stunting (UNICEF, 2024b). Malnutrition in early life is also linked with a higher risk of metabolic and non-communicable diseases later in life, such as hypertension, obesity, type 2 diabetes (De Sanctis *et al.*, 2021) and the recently discovered Type 5 diabetes (IDF, 2025), associated with chronic undernutrition, which predisposes lean individuals. These findings are consistent with the Developmental Origins of Health and Disease (DOHaD) hypothesis, which posits that nutritional deprivation during key developmental periods of life can have lasting consequences for the physiological systems (WHO, 2023; Isoje *et al.*, 2026b). In addition, children who have been severely malnourished suffer from ongoing deficits in cognitive function such as attention span, memory and performance in school, and, even after nutritional

rehabilitation, many children do not achieve full catch-up growth (Grantham *et al.*, 2007). This failure in recovery is due to epigenetic changes and changes in developmental trajectory due to nutritional insults at critical time windows. Childhood malnutrition is not a one-off clinical problem, but a life course problem with long-term public health consequences.

Socio-economic Impact

The Cognitive impairment associated with early childhood malnutrition has different consequences for educational achievement and long-term academic attainment. Such neurological deficits have direct implications on attention span, memory retention, and learning ability, which in turn negatively affect academic performance and educational attainment. Adeyemi *et al.* (2022), in their analysis of the decline in stunting in Nigeria from 2003 to 2018, highlighted improvement in household wealth and an increase in maternal education as the most important factors driving nutritional change. The findings show the reciprocity between socioeconomic developments.

Malnutrition has far-reaching economic implications. According to the World Bank (2022), Nigeria loses over US\$1.5 billion in GDP annually to vitamin and mineral deficiencies alone, and the wider African Union Cost of Hunger in Africa (COHA) analysis estimates that annual GDP losses attributable to child undernutrition across African countries range from roughly 2% to 16%, resulting from a loss of human capital in the country, including reduced labour productivity, increased health costs, limited returns on education investments, and higher rates of intergenerational poverty transmission.

Malnutrition places severe strain on Nigeria's healthcare system; malnourished children require more frequent and prolonged hospitalization for infectious diseases, yet many hospitals lack diagnostic tools, therapeutic products (including age-appropriate ready-to-use Therapeutic Foods formulations), and trained nutrition-competent personnel required for comprehensive malnutrition management (Gometi *et al.*, 2026). This capacity gap restricts the availability of treatment and helps ensure poor case detection and case management rates.

RESULTS AND DISCUSSION

Current Interventions and Policies

Nigeria has developed a multi-sectoral response framework involving government agencies, international organizations, and NGOs to address malnutrition. They are based on prevention, treatment, food security and social protection. Some of these initiatives are highlighted in this section.

The National Policy on Food and Nutrition

Nigeria's National Policy on Food and Nutrition outlines the national nutrition programming goals and provides the overarching network and inter-ministerial coordination mechanism to achieve the targets for reducing the prevalence of stunting, wasting and micronutrient deficiency. It seeks to enhance nutritional outcomes through a multi-sectoral partnership among the health, agriculture, education and social protection sectors (Bakare & Abiodun, 2022). This multi-sectoral approach is reflected in programmes such as the Community Health Influencers, Promoters and Services (CHIPS) scheme, which involves training community volunteers from the Basic Healthcare Provision Fund to provide nutrition-specific and nutrition-sensitive services at the household level; and the National Home-Grown School

Feeding Programme, which connects school feeding with local agricultural value chains (Okolo-Obasi & Uduji, 2024).

Maternal, Infant, and Young Child Nutrition (MIYCN) Programs

The government also supports Maternal, Infant, and Young Child Nutrition (MIYCN) programs to encourage exclusive breastfeeding, complementary feeding practices, micronutrient supplementation, and nutrition education. The MICYN program is focused on protecting the first 1,000 days of life by tracking World Health Organization, benchmarks like Minimum Dietary Diversity (MDD) and Minimum Acceptable Diet (MAD) (Costenbader *et al.*, 2025).

Social Safety Nets

Nigeria's social protection efforts against food insecurity and child undernutrition have largely centered on the National Cash Transfer Programme (NCTP) and the Home Grown-School Feeding Programme (HGSFP). Food access through school feeding programmes and cash for conditions has been rolled out in order to combat child hunger and boost food access for vulnerable groups. (Okolo-Obasi & Uduji, 2024; Nathaniel & Anthony, 2025).

Effectiveness and Gaps in Nigeria's Nutritional Interventions and Policies

Several challenges still exist despite the above-mentioned interventions. Monitoring and evaluation systems are not sufficiently strong to provide disaggregated, evidence-based information on programs in a timely fashion. Most evaluations assess program outputs, not nutritional outcomes, and this makes it challenging to determine which interventions are responsible for changes in stunting or wasting rates. The key gaps are the lack of funding and reliance on donors, which hamper the sustainability of nutrition programs (Yunusa *et al.*, 2026). A second challenge is the poor level of policy implementation at the state and local government levels, with the National Multi-Sectoral Plan of Action for Food and Nutrition (NMPFAN, 2021–2025) itself being a good example of this. Nutrition governance was weakly institutionalised; the National Assembly had not been equipped with a dedicated Committee on Nutrition and Food Security until the first one was inaugurated in February 2024, two years into the plan's five-year lifespan (Vanguard, 2025). In addition, limited monitoring and data systems make it difficult to monitor progress and make decisions, and the Northern regions have a higher level of malnutrition than the Southern regions (Onwujekwe *et al.*, 2023). Thus, Nigeria continues to suffer from one of the world's highest levels of stunting, with approximately 32% of children under five years of age affected despite persistent interventions, underscoring the need for significant and better coordinated efforts.

It is worth noting that structural reforms are required in addition to humanitarian action to mitigate the malnutrition situation in Nigeria, including the institutionalisation of nutrition budget lines and strengthening of legislative oversight at federal and state levels, which was attempted with the Nigeria's new Legislative Framework for Nutrition and Food Security, and the National Legislative Network on Nutrition and Food Security, which was inaugurated in July 2024 across the 36 states of the Federation (Vanguard, 2025). Some short- and long-term approaches are highly recommended.

Short term Strategies

Emergency Feeding Programs and Micronutrient supplementation

These interventions will enable local production of culturally appropriate Ready-to-Use Therapeutic Foods (RUTF) from affordable and sustainable farm-based ingredients like maize, soybean and groundnuts, making treatment more available and avoiding import delays (Moloro *et al.*, 2026). Utilization of locally available food commodities that are familiar to the population, relatively cheap, and not easily affected by disruptions in the international supply chain can help to improve the accessibility, affordability and sustainability of the therapeutic feeding programmes. Additionally, micronutrient supplementation such as vitamin A supplementation for children, iron and folate for pregnant women, and zinc supplementation for diarrhoea management should also be encouraged.

Primary Healthcare Nutrition Services

Strengthening primary healthcare nutrition services through training community health workers, early screening for malnutrition, and expanding integrated management of acute malnutrition is essential.

Long-term Strategies

Addressing Poverty and Food Insecurity

The government should address poverty and food insecurity by establishing economic stabilization mechanisms, robust social safety nets and fiscal policies to insulate vulnerable households from food price volatility, poverty, and environmental shocks such as flooding and drought that drive acute malnutrition spikes.

Support for the promotion of bio-fortified crops.

The use of bio-fortified staple crops (such as zinc-rich rice and wheat and vitamin A-rich cassava and maize) that target the staple food crops in populations' diets is a promising long-term strategy. One of the most powerful long-term strategies is to encourage the production of bio-fortified crops containing increased concentrations of micronutrients in staple foods such as rice and wheat, which are naturally bred. Many households rely on staple food crops such as maize, cassava and rice, so the production of naturally bio-fortified crops with higher micronutrient levels is one of the most powerful strategies. In the absence of any behavioural changes, these food staples will provide families with extra nutrients the moment they are bio-fortified. In a study in Nigeria, Atanasova *et al.* (2025) showed that school feeding programmes with bio-fortified foods led to a substantial boost in the micronutrient (iron, vitamin A and zinc) intake of children who took part in the exercise.

Integration of Water, Sanitation, and Hygiene (WASH) Goals with Local Farming Policies

Another essential approach is to integrate water, sanitation and hygiene (WASH) objectives within existing local agricultural policies, to better support environmental health and agricultural productivity. Ensuring household access to clean drinking water, improved sanitation and clean cooking fuels will help to safeguard children against repeated infections that affect nutrient uptake and worsen malnutrition (Pinto Jimenez *et al.*, 2023; Moloro *et al.*, 2026). Moreover, extensive extension programming should educate farmers in nutrient-dense crop cultivation, nutrient management in soil, modern farming methods, and nutrition-sensitive agriculture training, such as food preservation and processing techniques (Rita *et al.*, 2026). This holistic strategy establishes direct

connections between agricultural productivity and household nutrition security.

Investment in the Girl Child Education

Investment in the girl child's education is one of the highest-return interventions to improve long-term nutritional outcomes. The fact that maternal education was found by Adeyemi *et al.* (2022) to be one of the two most influential interventions in stunting reduction in Nigeria between 2003 and 2018 reinforces the importance of women's empowerment in the drive for nutrition.

Increased Advocacy on Breastfeeding Promotion Programs

Adebayebi *et al.* (2023) recognised that breastfeeding promotion programs in Nigeria are most effective when they target psychological and social support factors rather than being primarily informational barriers that demand a behavioural science approach to IYCF program design. Thus, increased advocacy on the promotion of breastfeeding programs will go a long way in enhancing the nutritional status of children.

Increased community-based Education

The use of community-based behaviour change communication, adapted and delivered by trusted community health educators, should directly target harmful practices such as discarding colostrum, early complementary feeding, and taboos on protein-rich foods for young children.

CONCLUSION

Nigeria faces a persistent child malnutrition crisis, remaining among the top nations globally for under-five stunting and wasting due to unresolved issues like poverty, regional conflicts and systemic inflation. Addressing these developmental losses will need an integrated response which will comprehensively take on board individual, household and environmental vulnerabilities. To begin with, political will, sufficient investment, multi-sectoral coordination, community participation and investment in food systems and maternal health are essential for sustainable malnutrition reduction. Additionally, actions must not only be taken to provide temporary relief, but to implement sustainable and community-based solutions, including nutritional surveys, providing support to farmers who grow nutrient-rich foods, providing better access to agricultural information, and providing better nutrition education for women and children. This agricultural-nutrition nexus represents a more sustainable approach to tackling malnutrition and achieving better health outcomes, addressing childhood micronutrient deficiencies and enhancing food security in Nigeria's most vulnerable areas. Finally, ending Nigeria's malnutrition crises is both a technical challenge and a moral and political imperative. It does not only require better nutrition programmes but a change in the social, economic and governance schemes.

REFERENCES

Abubakar, H. A., Shahril, M. R., & Mat, S. (2024). Nutritional status and dietary intake among Nigerian adolescents: A systematic review. *BMC Public Health*, 24(1), 1764. <https://doi.org/10.1186/s12889-024-19219-w>

Adebayebi, A., Scally, A., Lesk, V., & Stewart-Knox, B. J. (2023). A survey of breastfeeding attitudes and health locus of control in the Nigerian population. *Maternal and Child Health Journal*, 27, 1097–1108. <https://doi.org/10.1007/s10995-023-03638-z>

Adeyemi, O. T., Touré, M., Covic, N., Van den Bold, M., Nisbett, N., & Headey, D. (2022). Understanding drivers of stunting reduction in Nigeria from 2003 to 2018: A regression analysis. *Food Security*, 14, 995–1011. <https://doi.org/10.1007/s12571-022-01279-8>

Adeyeye, S. A. O., Ashaolu, T. J., Bolaji, O. T., Abegunde, T. A., & Omoyajowo, A. O. (2023). Africa and the nexus of poverty, malnutrition, and diseases. *Critical Reviews in Food Science and Nutrition*, 63(5), 641–656. <https://doi.org/10.1080/10408398.2021.1952160>

African Union Development Agency (AUDA-NEPAD). (2019). *The cost of hunger in Africa: Social and economic impact of child undernutrition*. African Union. https://au.int/sites/default/files/pressreleases/35551-pr-joint_press_release_-_coha_niger_en_12_12_2019_1.pdf

Agostoni, C., Baglioni, M., La Vecchia, A., Molari, G., & Berti, C. (2023). Interlinkages between climate change and food systems: The impact on child malnutrition—Narrative review. *Nutrients*, 15(2), 416. <https://doi.org/10.3390/nu15020416>

Ahmed, K. Y., Dadi, A. F., Ogbo, F. A., Page, A., Agho, K. E., Akalu, T. Y., & Ross, A. G. (2023). Population-modifiable risk factors associated with childhood stunting in sub-Saharan Africa. *JAMA Network Open*, 6(10), e2338321. <https://doi.org/10.1001/jamanetworkopen.2023.38321>

Akinteye, J. O. (2025). Exploring the effects of fuel subsidy removal on national development: The Nigerian situation. *Journal of Human Resources and Management Science*, 8(7), 33–52. <https://doi.org/10.70382/hujhrms.v8i7.021>

Akpogheli, E. O., Chiadika, E. O., Edo, G. I., Al-Baitai, A. Y., Zainulabdeen, K., Keremah, S. C., & Ekpekpko, L. D. (2024). Malnutrition and food insecurity in northern Nigeria: An insight into the United Nations World Food Program (WFP) in Nigeria. *Discover Food*, 4(1), 165. <https://doi.org/10.1007/s44187-024-00249-7>

Amusa, L. B., Yahya, W. B., & Bengesai, A. V. (2023). Spatial variations and determinants of malnutrition among under-five children in Nigeria: A population-based cross-sectional study. *PLOS ONE*, 18(4), e0284270. <https://doi.org/10.1371/journal.pone.0284270>

Asaju, K., & Kwakano, A. (2025). Armed conflict on food security in Nigeria. *International Journal of Recent Advances in Multidisciplinary Research*, 12(7), 1151–1161.

Atanasova, P., Singh, S., Adebayo, A., Adekunle, F., & Adesanmi, A. (2025). Availability, affordability, awareness, preferences, and nutritional impact of biofortified crops in Nigeria. *Nutrients*, 17(6), 1036. <https://doi.org/10.3390/nu17061036>

Bakare, L. A., & Abiodun, O. M. (2022). Food security crisis in Nigeria: An assessment of the influence of national policy on food and nutrition on food security in Nigeria. *International Journal of Intellectual Discourse*, 5(3), 101–115.

Black, M. M. (2003). Micronutrient deficiencies and cognitive functioning. *The Journal of Nutrition*, 133(11 Suppl 2), 3927S–3931S. <https://doi.org/10.1093/jn/133.11.3927S>

- Costenbader, E., Memmott, C., Litvin, K., Green, M., Mba-Oduwusi, N., Offiaeli, I., & Hajeebhoy, N. (2025). Gendered social norms, exceptions, and sanctions: Implications for maternal, infant, and young child nutrition in Nigeria. *Current Developments in Nutrition*, 9(1), 104524. <https://doi.org/10.1016/j.cdnut.2024.104524>
- De Sanctis, V., Soliman, A., Alaaraj, N., Ahmed, S., Alyafei, F., & Hamed, N. (2021). Early and long-term consequences of nutritional stunting: From childhood to adulthood. *Acta Bio-Medica: Atenei Parmensis*, 92(1), e2021168. <https://doi.org/10.23750/abm.v92i1.11346>
- Dessie, G., Li, J., Nghiem, S. V., & Doan, T. (2024). Prevalence and determinants of stunting-anemia and wasting-anemia comorbidities and micronutrient deficiencies in children under 5 in the least-developed countries: A systematic review and meta-analysis. *Nutrition Reviews*, 82(6), nuac063. <https://doi.org/10.1093/nutrit/nuac063>
- Elegbeleye, J. A., Fayemi, O. E., Agbemavor, W. S. K., Krishnamoorthy, S., Adebawale, O. J., Adeyanju, A. A., Mkhabela, B., & Bamidele, O. P. (2025). Beyond calories: Addressing micronutrient deficiencies in the world's most vulnerable communities—A review. *Nutrients*, 17(24), 3960. <https://doi.org/10.3390/nu17243960>
- Ene-Obong, H. N., Alozie, Y. E., Abubakar, S. M., Aburime, L. C., & Leshi, O. O. (2020). Update of the nutrition situation in Nigeria. *North African Journal of Food and Nutrition Research*, 4(9), 63–74. <https://doi.org/10.51745/najfnr.4.9.S63-S74>
- FAO, IFAD, UNICEF, WFP, & WHO. (2025). *The state of food security and nutrition in the world 2025 – Addressing high food price inflation for food security and nutrition*. FAO. <https://doi.org/10.4060/cd6008en>
- Famine Early Warning Systems Network (FEWS NET). (2024). *Nigeria food security outlook: June 2024–January 2025*. <https://fews.net/west-africa/nigeria/food-security-outlook/june-2024>
- Federal Ministry of Agriculture and Rural Development. (2022). *Agricultural sector food security and nutrition strategy 2016–2025*. <http://ngfrepository.org.ng:8080/jspui/handle/123456789/5377>
- Federal Ministry of Health and Social Welfare of Nigeria, National Population Commission, & ICF. (2024). *Nigeria Demographic and Health Survey 2023–24: Key indicators report*. NPC and ICF. <https://dhsprogram.com/pubs/pdf/PR157/PR157.pdf>
- Gometi, S. A., Ikpawhore, D. O., Evuen, U. F., Omo-Okoroh, M. O., Otovbo, E. J., Okwenu, P. C., Isoje, A. I., & Onosakponome, I. (2026). Nutritional modulation of biochemical pathways in stress response: A comprehensive review. *Food and Humanity*, 6, 101017. <https://doi.org/10.1016/j.foohum.2026.101017>
- Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., & Strupp, B. (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, 369(9555), 60–70. [https://doi.org/10.1016/S0140-6736\(07\)60032-4](https://doi.org/10.1016/S0140-6736(07)60032-4)
- The Guardian Nigeria. (2024, February 12). *How food prices defied interventions in agriculture sector, soared by 170% in 5yrs*. <https://www.pressreader.com/nigeria/the-guardian-nigeria>
- Guerrant, R. L., DeBoer, M. D., Moore, S. R., Scharf, R. J., & Lima, A. A. M. (2013). The impoverished gut—a triple burden of diarrhoea, stunting, and chronic disease. *Nature Reviews Gastroenterology & Hepatology*, 10(4), 220–229. <https://doi.org/10.1038/nrgastro.2012.239>
- International Diabetes Federation. (2025). *Type 5 diabetes*. <https://idf.org/about-diabetes/types-of-diabetes/type-5-diabetes/>
- Ilo, J., Kayode, O., Jacob, T., Oduntan, B., & Lawal, R. (2025). Addressing malnutrition in Nigeria: A narrative review of causes, impacts, and pathways to nutritional resilience. *Journal of Research in Applied and Basic Medical Sciences*, 11(2), 163–175. <https://doi.org/10.61186/rabms.11.2.163>
- Isoje, A. O., Okwenu, P. C., Sefia, U., Otovbo, J. E., Onosakponome, I., Otedo, J. O., Gometi, S. A., & Evuen, U. F. (2026a). The pathophysiological nexus and management of diabetes: A narrative review with a focus on the Nigerian perspective. *Dutse Journal of Pure and Applied Sciences*, 12(2d), 39–54. <https://doi.org/10.4314/dujopas.v12i2d.4>
- Isoje, A. O., Okwenu, P. C., Etaghene, J. O., Onosakponome, I., Evuen, U. F., Otovbo, E. J., Omo-Okoroh, M. O., Akpede, E. J., & Sefia, U. (2026b). The growing concern of Type 5 diabetes mellitus: A narrative review. *Bangabandhu Sheikh Mujib Medical University Journal*, 19(2), e87653. <https://doi.org/10.3329/bsmmuj.v19i2.87653>
- John, C., Poh, B. K., Jalaludin, M. Y., Michael, G., Adedeji, I., Oyenusi, E. E., & Muhardi, L. (2024). Exploring disparities in malnutrition among under-five children in Nigeria and potential solutions: A scoping review. *Frontiers in Nutrition*, 10, 1279130. <https://doi.org/10.3389/fnut.2023.1279130>
- Molero, A. H., Sabo, K. G., Mare, K. U., Wengoro, B. F., Endrias, E. E., Ibrahim, R. M., Dubie, T., Ebrahim, O. A., & Lahole, B. K. (2026). Prevalence of stunting and its determinants among children under five in 35 sub-Saharan African countries (2011–2024): Insights from recent demographic health survey data using a generalized linear mixed-effects model with robust Poisson regression. *PLOS ONE*, 21(3), e0344358. <https://doi.org/10.1371/journal.pone.0344358>
- Médecins Sans Frontières (MSF). (2025). *Malnutrition crisis report: Nigeria*. <https://www.msf.org>
- Müller, O. (2005). Malnutrition and health in developing countries. *Canadian Medical Association Journal*, 173(3), 279–286. <https://doi.org/10.1503/cmaj.050342>
- Musa, I., Kabir, M. Y., & Umar, A. (2026). Beyond the surface: Validating the anthropometric-biochemical link in childhood malnutrition in Sokoto State, Nigeria. *International Journal of Research and Scientific Innovation*, 13(15). <https://doi.org/10.51244/ijrsi.2026.1315ph00050>

- Mustafa, I. A., & Sa'ad, I. (2025). Farmer-herder conflict in Benue State, Nigeria. *Journal of Spatial Information Sciences*, 2(1), 15–25. <https://doi.org/10.5281/zenodo.14809044>
- Nathaniel, U., & Anthony, A. (2025). Conditional cash transfer and poverty reduction among vulnerable households in Nigeria public service delivery. *International Journal of Research and Innovation in Social Science*, 9(10), 6462–6471. <https://doi.org/10.47772/IJRISS.2025.910000527>
- National Population Commission (NPC) [Nigeria], & ICF International. (2014). *Nigeria Demographic and Health Survey 2013*. NPC and ICF International. <https://www.unicef.org/nigeria/sites/unicef.org.nigeria/files/2018-09/Nigeria-demographic-and-health-survey-2013.pdf>
- National Population Commission (NPC) [Nigeria], & ICF. (2019). *Nigeria Demographic and Health Survey 2018: Key indicators report*. NPC and ICF. <https://ngfrepository.org.ng:8443/bitstream/123456789/3145/1/NDHS%202018.pdf>
- Obada, A. A., Msughte, A. E., Namadi, H. M., & Nongubee, T. (2021). High prevalence of malnutrition in the Nigerian context. *Biomedical Journal of Scientific & Technical Research*, 39(1), 30916–30925. <https://doi.org/10.26717/BJSTR.2021.39.006237>
- Obasohan, P. E., Walters, S. J., Jacques, R., & Khatib, K. (2024). Socioeconomic, demographic, and contextual predictors of malnutrition among children aged 6–59 months in Nigeria. *BMC Nutrition*, 10(1), 1. <https://doi.org/10.1186/s40795-023-00813-x>
- Oche, M. O., Umar, A. S., & Ahmed, H. (2011). Knowledge and practice of exclusive breastfeeding in Kware, Nigeria. *African Health Sciences*, 11(3), 518–523.
- Ojiako, C. I., Okoye, E. C., & Lawrence, O. F. (2025). Economic downturn and rising insecurity in Nigeria: The reverse causality. *International Journal of Public Administration and Development Studies*, 2(2), 13–26. <https://ijpads.com/index.php/ijpads/article/view/40>
- Okolo-Obasi, N. E., & Uduji, J. I. (2024). The impact of national home-grown school feeding programme (NHGSFP) on rural communities in Nigeria. *Journal of Economic and Administrative Sciences*, 40(5), 988–1005. <https://doi.org/10.1108/JEAS-10-2021-0211>
- Okyere, J., Donkoh, I. E., Seidu, A. A., Ahinkorah, B. O., Aboagye, R. G., & Yaya, S. (2024). Mother-child dyads of overnutrition and undernutrition in sub-Saharan Africa. *Journal of Health, Population, and Nutrition*, 43(1), 1. <https://doi.org/10.1186/s41043-023-00479-y>
- Omokpariola, D., Agbanu-Kumordzi, C., Omoefe, G., Idris, T., Samuel, T., Andikan, V. D., & Kwame, A. C. (2026). Malnutrition and double burden of disease: The African dilemma of non-communicable disease. *Frontiers in Sustainable Food Systems*, 10, 1800043. <https://doi.org/10.3389/fsufs.2026.1800043>
- Onwujekwe, O., Agwu, P., Onuh, J., Uzochukwu, B., Ajaero, C., Mbachu, C., Orjiakor, C. T., Odii, A., & Mirzoev, T. (2023). An analysis of urban policies and strategies on health and nutrition in Nigeria. *Urban Research & Practice*, 16(1), 66–91. <https://doi.org/10.1080/17535069.2021.1932020>
- Onwunye, U. M., & Anekwe, N. J. (2020). Interrogating clashes in Benue State and their implications on food security in Nigeria. *Social Scientia: Journal of Social Sciences and Humanities*, 5(3), 69–85. <https://journals.aphriapub.com/index.php/SS/article/view/1137>
- Pinto Jimenez, C. E., Keestra, S. M., Tandon, P., Pickering, A. J., Moodley, A., Cumming, O., & Chandler, C. I. (2023). One Health WASH: An AMR-smart integrative approach to preventing and controlling infection in farming communities. *BMJ Global Health*, 8(3), e011263. <https://doi.org/10.1136/bmjgh-2022-011263>
- Popoola, G., & Popoola, O. (2024). Food insecurity transition among agricultural households in Nigeria. *Journal of Development Agriculture*, 14(4), 924515. <https://doi.org/10.1353/jda.2024.a924515>
- Rita, U. O., Oritsematosan, M. O., & Adaighofua, O. (2026). Crop biofortification as an intervention strategy for reducing nutritional diseases among rural farmers in Okpe LGA, Delta State, Nigeria. *International Journal of Innovative Science and Research Technology*, 11(4), 2917–2928. <https://doi.org/10.38124/ijisrt/26apr1256>
- Sablah, M. (2019). *Causes and impacts of undernutrition over the life course*. UNICEF. <https://www.un.org/en/development/desa/population/events/pdf/expert/30/presentations/Tuesday/Session4/Causes%20-%20Consequences%20of%20Undernutrition%20ICPD%20-%20UNICEF.pdf>
- Seiler, J., Müller, B., Günther, I., Wetscher, M., Stauffer, R., Umlauf, N., & Harttgen, K. (2026). Co-occurrence patterns of malnutrition indicators among children in sub-Saharan Africa. *Nature Communications*, 17, Article 1426. <https://doi.org/10.1038/s43856-026-01426-8>
- Sommer, A. (1995). *Vitamin A deficiency and its consequences: A field guide to detection and control* (3rd ed.). World Health Organization. <https://apps.who.int/iris/handle/10665/40535>
- Ukwe, C. (2025). Nigeria and food security challenges: Intertwining of climate change and non-state armed groups and policy interventions. *IntechOpen*. <https://www.intechopen.com/online-first/1189542>
- UNICEF. (2019). *Nutrition*. <https://www.unicef.org/nigeria/nutrition>
- UNICEF. (2024a). *1 in 3 children in Nigeria experiences severe child food poverty due to conflict, climate crises, and inequity*. <https://www.unicef.org/nigeria/press-releases/1-3-children-nigeria-experiences-severe-child-food-poverty-due-conflict-climate>
- UNICEF. (2024b). *The state of the world's children 2024: Child nutrition*. <https://www.unicef.org>
- UNICEF, WHO, & World Bank Group Joint Child Malnutrition Estimates (JME). (2025). *Levels and trends in child malnutrition: Key findings of the 2025 edition*. World

- Health Organization. <https://iris.who.int/bitstream/handle/10665/381846/9789240112308-eng.pdf>
- Uto, O., Obiekwe, N. J., Nwankwo-Offiah, E. O., & Muojekwu, A. C. (2025). Impact of insecurity on food security in Benue State, Nigeria. *International Journal of Sub-Saharan African Research*, 3(3), 149–161. <https://doi.org/10.5281/zenodo.17247398>
- Vanguard. (2025, November 14). *FG launches Nigeria's legislative framework for nutrition and food security*. <https://www.vanguardngr.com/2025/11/fg-launches-nigerias-legislative-framework-for-nutrition-and-food-security/>
- Wariri, O., Akhimienho, K., Alhassan, J., Jalo, I., Oloyede, I., Nyong, E., & Bode-Thomas, F. (2020). Population and individual-level double burden of malnutrition among adolescents in two emerging cities in northern and southern Nigeria: A comparative cross-sectional study. *Annals of Global Health*, 86(1), 93. <https://doi.org/10.5334/aogh.3093>
- World Bank. (2022). *Project appraisal document: Accelerating nutrition results in Nigeria*. World Bank Group. <https://documents1.worldbank.org/curated/en/708631523136519588/pdf/Project-Information-Documents-Integrated-Safeguards-Data-Sheet-Accelerating-Nutrition-Results-in-Nigeria-P162069.pdf>
- World Bank. (2025). *Nigeria poverty & equity brief*. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099253204222517873>
- World Health Organization. (2023). *Malnutrition (fact sheet)*. <https://www.who.int/news-room/fact-sheets/detail/malnutrition>
- World Health Organization & United Nations Children's Fund. (2021). *Indicators for assessing infant and young child feeding practices: Definitions and measurement methods*. World Health Organization. <https://iris.who.int/handle/10665/340706>
- Yunusa, U., Zakirai, M. S., Yunusa, A., Bello, U. L., Ibrahim, A. H., Mohammed, S., Yunusa, H., Rajah, A. S., Olugbodi, K. H., & Yunusa, Y. (2026). Nigeria's public health system: A narrative review of key indicators, systemic challenges, and community-based solutions. *Journal of Community Medicine & Primary Health Care*, 38(1), 14–27.
- Yusuf, A. B., Sani, I., John, E., & Adetunji, K. O. (2025). Assessment of micronutrient deficiencies among children under five in selected urban and rural areas of Birnin Kebbi Local Government Area, Kebbi State, Nigeria. *South Asian Journal of Life Sciences*, 30(2), 22–34. <https://doi.org/10.33003/sajols-2025-030222-34>

