



Department of Economics and Development Studies  
Alex Ekwueme Federal University, Ndufu-Alike, Ebonyi State, Nigeria.

Website: <https://www.ecofunai.ng>

ISSN (Print): 2536-6793 | ISSN (Electronic): 2536-6742

Volume 3 (2) August, 2026 (pp 222 -241)

Submitted May 2026; Published August 2026.

## Investigating Socioeconomic Drivers of Health Inequalities in Nigeria: A Comparative Analysis of Adult and Child Nutritional Outcomes

<sup>1</sup>Rabi'u Isah Moh'd, <sup>2</sup>Dominic Iortyer Aondover, <sup>3</sup>Enemona Emeji Negedu, & <sup>4</sup>Rotimi Ekundayo Mathew

<sup>1,2,3,4</sup>Federal University Lokoja, Kogi State, Nigeria.

Email: [rabiuiisah@fulokoja.edu.ng](mailto:rabiuiisah@fulokoja.edu.ng)

### ABSTRACT

*This study undertakes a comparative analysis of socioeconomic health inequalities in Nigeria, focusing on the dual burden of malnutrition. Utilizing nationally representative data from the Nigeria Demographic and Health Surveys (2008, 2013, 2018), the study examines adult nutritional status via Body Mass Index (BMI) and child nutritional status via Weight-for-Age Z-scores (WAZ). Employing Concentration Index (CI) and Oaxaca-Blinder decomposition techniques, the research moves beyond documenting disparities to unravel their underlying mechanisms. The results of the study reveal contrasting socioeconomic gradients. It shows that while there is a persistent and growing pro-rich inequality in adult BMI, driven increasingly by inequalities in education and urban residence, alongside significant unexplained structural barriers, it finds a strong and enduring pro-poor inequality in child WAZ, predominantly explained by maternal education and access to antenatal care, yet increasingly compounded by systemic failures that prevent poor households from translating resources into health gains. These divergent patterns suggested that Nigeria is facing a dual burden of malnutrition, where overnutrition rises among the affluent while undernutrition remains entrenched among the disadvantaged. The study recommends addressing the structural determinants of both undernutrition and overnutrition to achieve health equity, among others.*

**Keywords:** Health Inequality, Socioeconomic Status, Dual Burden of Malnutrition, Oaxaca-Blinder Decomposition

**JEL Classification:** I14, I15, I18, J13.

## 1. Introduction

Inequalities in health have been one of the most persistent challenges and of much interest to both public health and development economics. Evidence from research shows that health outcomes are systematically determined by socioeconomic status. They suggest that people in lower income category, or who are less educated, or are in occupations adjudged to be of low position are experiencing poorer health than their counterparts in a better position, virtually across all indicators of health and across different regions of the world (Morris, Sutton & Gravelle., 2005; Fatukasi & Ayeomoni, 2015; Hanibuchi, Nakaya & Honjo 2016; Khang and Cho, 2006; Ramesh, et al., 2024). So, these disparities are not purely biological but are reflections of the unequal distribution of resources, opportunities and living conditions that shape exposure to risks and access to protective factors (Marmot et al., 2008; Wilkinson & Pickett, 2017).

The global empirical literature on socioeconomic health inequalities consistently shows the prevailing and often increasing inequalities shaped by income, education, occupation and factors like race and geography. In high-income countries like the United States and the United Kingdom, studies have shown that marginalized racial and ethnic groups, as well as lower-income populations, significantly experience worse health outcomes compared to their counterpart mainly due to systemic inequities in healthcare access, occupational hazards, and residential differences (Wolfe et al., 2021; Bambra et al., 2020).

Unfortunately, since the unequal distribution of resources is more prevalent in low- and middle-income countries (LMICs), the socioeconomic health disparities are also particularly worrisome and steeper. These exacerbate the health consequences of poverty and disadvantage (WHO, 2021; Black et al., 2013). Particularly, Sub-Saharan Africa continues to bear a disproportionate burden of infectious disease and child undernutrition on one hand, while also experiencing a rapid rise in non-communicable diseases associated with urbanization and lifestyle change on the other hand (Gouda et al., 2019; Popkin, Corvalan & Grummer-Strawn, 2020). This has given rise to a dual burden of malnutrition: the persistence of undernutrition (e.g., stunting, wasting) among the poor, alongside a rapid rise in overnutrition (overweight and obesity) and related non-communicable diseases among more advantaged and urban populations. This dual burden presents a unique policy challenge, as it requires interventions that tackle seemingly opposing problems that emanate from the same fundamental drivers of socioeconomic disparities.

Despite its economic size, Nigeria exemplifies this dual health challenge. It continues to grapple with high socioeconomic inequalities in income, education, and employment (NBS, 2020; UNDP, 2020). While there is a substantial body of research documenting the existence and persistence of health inequalities in Nigeria, the literature predominantly focuses on maternal and child health (MCH). The findings have consistently shown that poorer households, mothers with lower educational attainment, and rural residents experience worse health outcomes, especially in maternal mortality rates, antenatal care utilization, and children's stunting and wasting (Adeyanju et al., 2017; Okoli et al., 2020; Akombi et al., 2019). These studies, in essence, effectively show that access to healthcare is a key dimension and determinant of inequality. Again, a smaller but yet important growing strand of literature examines adult health and non-communicable diseases. They revealed a contrasting socioeconomic gradient where obesity and diabetes are often found

to be positively associated with wealth and urban residence (e.g Adebayo et al., 2019). However, many of these studies rely heavily on descriptive statistics.

Again, studies are often segregated by age group, analysing either child or adult health (e.g Moh'd, Ilemona & Abdulganiyu, 2025). This obscures a general, household-level understanding of how finite socioeconomic resources are allocated and how health risks are distributed across the life course within families. A comparative analysis that explicitly shows how contrasting the drivers of inequality for adults and children are is lacking. Also, while some studies establish correlation and describe inequality using measures like the Concentration Index, just a few studies went into decomposing the gap between the most and least advantaged to isolate the specific, quantifiable contributions of key factors like wealth.

## **Research Questions**

This research intends to answer the following questions:

- a) What is the density of health inequality on socioeconomic status in Nigeria?
- b) What is the decomposed contribution of different socioeconomic status on health inequalities in Nigeria?

## **Objectives of the Study**

The sole aim of this research is to investigate the drivers of health inequality in both adults' and children's health. The specific objectives are to:

- a) Determine the density of health inequality on socioeconomic status in Nigeria; and
- b) Decompose the contribution of socioeconomic status to health disparities in Nigeria.

## **2. Literature Review**

### **Conceptual Literature**

#### **Body Mass Index (BMI)**

WHO (2006) defines Body Mass Index (BMI) as “a simple index of weight-for-height that is commonly used to classify underweight, overweight, and obesity in adults, calculated as a person’s weight in kilograms divided by the square of their height in meters ( $\text{kg}/\text{m}^2$ ).” As a widely adopted indicator, BMI is instrumental in evaluating an individual’s nutritional status and potential health risks. It is determined by dividing a person’s weight in kilograms by the square of their height in meters ( $\text{kg}/\text{m}^2$ ). BMI is broadly utilized in both public health research and clinical settings to identify populations at heightened risk for diet-related diseases, including diabetes, cardiovascular conditions, and specific types of cancer (WHO, 2000; Flegal, Kit, Orpana, & Graubard, 2012). This paper adopts the definition of BMI proposed by WHO (2006).

#### **Wealth**

According to Wolff (1995), wealth refers to the total value of financial and non-financial assets owned by an individual, household, or group, minus any liabilities or debts. It encompasses a broad array of resources such as land, housing, livestock, savings, durable goods, and access to essential infrastructure and services like clean water, electricity, and sanitation. Unlike income, which reflects a regular flow of earnings over

time, wealth is a stock variable that captures accumulated resources and long-term economic status. This makes it a particularly useful indicator for understanding structural inequalities and long-term social positioning.

In the Demographic and Health Surveys (DHS), direct data on income or expenditure are often unavailable or unreliable. Consequently, the construction of a wealth index using asset-based indicators and housing characteristics through principal component analysis (PCA) is proposed. This method has since become a standard approach in large-scale surveys to categorize households into wealth quintiles, allowing researchers to assess inequalities in health and other outcomes across socioeconomic strata. Wealth, as measured through this composite index, serves as a robust proxy for long-term economic well-being and is especially useful in low- and middle-income country contexts where formal income records may be scarce or inconsistent (Rutstein & Johnson, 2004). This paper adopts the definition of wealth proposed by Wolff (1995).

## **Education**

Education, defined as "the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits" (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021), is a key socioeconomic determinant of health. It directly enhances health literacy and indirectly affects health through its influence on employment and income (Elo, 2009). Education is commonly measured as an ordinal variable (e.g., no education to tertiary) or as years of schooling, allowing for flexibility in socioeconomic status (SES) comparisons across contexts (Hoffmann, Kröger, & Geyer, 2019). As an SES indicator, education is relatively stable over time and less prone to short-term fluctuations than income or occupation (Mirowsky & Ross, 2003). It is also strongly associated with health outcomes, including mortality, chronic diseases, and health behaviours (Marmot, Friel, Bell, Houweling & Taylor, 2008). This paper adopts the definition of Education by UNESCO (2021).

## **Occupation**

Occupation, defined as an individual's regular work or profession performed for payment (ILO, 2021), is a vital indicator of socioeconomic status and plays a key role in understanding health inequalities. It reflects job prestige, income stability, and working conditions, all of which influence health outcomes (Marmot et al., 2008). Two major frameworks are used to classify occupations. The Registrar General's Social Class (RGSC) categorizes jobs into a hierarchy from professionals (Class I) to unskilled manual workers (Class V), often simplified into manual and non-manual classes to study income and health disparities (Bartley, 2017). The Erikson and Goldthorpe Schema (1992) offers a more flexible, non-hierarchical approach by grouping occupations based on employment relations, distinguishing between service contracts (e.g., professional and managerial roles) and labour contracts (e.g., manual and lower-tier jobs) (Arcaya, Arcaya & Subramanian, 2015; Goldthorpe, 2016). This study uses the definition of occupation by Bartley (2017).

## **2.2 Theoretical Literature**

### **Social Welfare Theory**

The Social Welfare Theory, introduced by Dalton (1920), provides a foundation for analysing inequality beyond income by linking social welfare to the distribution of individual wellbeing. It argues that two

societies with the same average income can experience different levels of welfare if income is distributed differently. Social welfare is expressed as the average utility derived from individuals' incomes:

$$w = \frac{1}{N} \sum_{i=1}^N U(y_i)$$

where  $U(y_i)$  is an increasing and concave utility function, implying that additional income generates smaller gains in welfare as income rises.

Recognizing that wellbeing depends on more than income, Atkinson and Bourguignon (1982) extended the framework to include multiple dimensions such as health and education:

$$w = \frac{1}{N} \sum_{i=1}^N U(y_i, x_i)$$

This multidimensional approach allows researchers to examine how different socioeconomic factors jointly influence welfare. The relationship between dimensions may be independent, substitutable (one compensates for another), or complementary (improvements in one enhance the other). For health and income, complementarity is often considered the most realistic assumption since higher income generally improves access to healthcare and better health can enhance earning potential.

### Rawls' Theory of Justice

Rawls' Theory of Justice (1992) emphasizes fairness and equal opportunity in the distribution of social goods. Although Rawls did not classify health as a basic liberty, Bommier and Stecklov (2002) argued that equal access to healthcare should be regarded as a fundamental right because it enables individuals to achieve their potential health status regardless of socioeconomic background.

Under this framework, individuals with similar health endowments should attain comparable health outcomes irrespective of income. The welfare function is represented as:

$$w = \frac{1}{N} \sum_{i=1}^N U(E(h_i|y_i))$$

where  $U$  is increasing and concave, and  $E(h_i|y_i)$  denotes expected health conditional on income.

The theory implies that health outcomes should not systematically vary with income if opportunities are genuinely equal. While this framework is useful for evaluating equity in health, it mainly focuses on average health within income groups and overlooks variations among individuals in the same group. From a Rawlsian perspective, a more comprehensive assessment should also consider the distribution of health within income groups, especially among the least advantaged. This makes the theory highly relevant for studies of multidimensional health inequality, where fairness in both access to healthcare and health outcomes is central.

### Grossman Model

The Michael Grossman human capital model (1972) explains health as a form of capital that individuals invest in because it generates utility and improves productivity. People derive satisfaction from both health and the consumption of other goods:

$$U = U(H, O)$$

Health is viewed as a stock that depreciates over time due to ageing, illness, or unhealthy behaviours but can be maintained or improved through investments such as medical care, exercise, and healthy lifestyles. Individuals allocate their time and income between work, health-related activities, and the consumption of other goods while seeking to maximize their overall wellbeing within their budget and time constraints.

Health investment depends on inputs such as medical care and education, while income is partly determined by an individual's health status. The model therefore highlights the close relationship between socioeconomic resources and health outcomes. This study is particularly concerned about the extension of the Grossman model developed by Valentina Dardanoni and Adam Wagstaff (1987), which incorporates uncertainty into health investment decisions. Their model recognizes that although investing in health generally improves future health and income, outcomes remain uncertain because illness may still occur due to factors beyond individual control, such as infectious diseases or other external shocks. The key implication of the modified model is that wealthier individuals are more likely to invest in health because they are better able to bear the risks associated with uncertain health returns. As a result, they tend to accumulate better health over time, while individuals with fewer financial resources often invest less in health and experience poorer health outcomes.

## 2.3 Empirical Review

Anteneh et al. (2025) did a multi-country study that pooled DHS data from 35 sub-Saharan African countries to quantify wealth-related inequalities in under-five undernutrition using concentration indices, Erreygers normalization and Wagstaff-style decomposition. The authors report a large, statistically significant pro-poor concentration of undernutrition ( $ECI = -0.172$ ), and show that drivers of this inequality include rural residence, maternal occupation and poor access to sanitation and safe water; conversely, media exposure and parental education reduced inequality. A limitation noted is substantial between-country heterogeneity and the cross-sectional nature of DHS data, which constrains causal claims.

Marume, Kasanzu & Chirenda (2025) researched socioeconomic and rural-urban disparities in the double burden of childhood malnutrition. Using two DHS rounds across 22 sub-Saharan countries, this paper applies generalized linear models (GLMs) with random effects to examine temporal and rural-urban patterns in the double burden (stunting, wasting, overweight) among children. The authors find that higher household income is associated with lower odds of stunting and wasting but higher odds of child overweight ( $AOR \approx 1.22$ ), while rural residence remains a strong predictor of undernutrition; they also document declining odds of stunting, wasting and overweight over time but persistent rural-urban and wealth-related disparities.

Atsu et al. (2024) used Demographic and Health Survey (DHS) data from 23 sub-Saharan African countries to analyze residence-based inequalities in overweight and obesity through a multivariate non-linear decomposition approach. Their analysis showed that urban residents were more likely to be overweight or obese compared to rural dwellers, largely due to differences in education, wealth, and lifestyle behaviors.

The decomposition method helped quantify how much each factor contributed to the inequality. Nevertheless, the study's reliance on pooled secondary data limited the ability to capture context-specific factors within countries.

Ke, Zhang, Hao, and Liu (2023) investigated the association between socioeconomic status and the risk of overweight and obesity among children and adolescents in China. Using data from a nationally representative health and nutrition survey, they conducted regression analyses and found that children from wealthier families and those with parents who had higher education levels were more likely to be overweight or obese. Although the study's large sample size strengthens its validity, the reliance on cross-sectional data precludes causal interpretations.

Oyan and Ndu-Akinla (2023) assessed the relationship between overweight/obesity and sociodemographic characteristics among adults attending a tertiary hospital in Rivers State, Nigeria. Employing a descriptive, hospital-based study design. Statistical analysis using Fisher's exact test revealed that overweight and obesity prevalence were 32.5% and 36.6%, respectively, with female gender being the only sociodemographic factor independently associated with higher BMI ( $P = 0.011$ ). The hospital-based sample may not be representative of the general population, limiting the generalizability of the findings.

Vale et al. (2022) explored the social determinants of obesity and stunting among adolescents in Brazil using a multilevel analysis of national survey data. The study aimed to understand how socioeconomic inequalities at individual and contextual levels affect nutritional status. Results showed that adolescents from low-income households and underserved regions were more likely to be both obese and stunted. Lack of access to healthcare services and quality education were also key contributing factors. Despite its comprehensive multilevel approach, the study relied on secondary data and self-reported indicators, which may introduce measurement bias.

A study by Eze, Odum, Onwe, and Njoku (2021) aimed to determine the socio-demographic determinants of BMI among school children in Ebonyi State, Nigeria. Utilizing a cross-sectional design, the researchers collected data from 1,000 primary and secondary school students through questionnaires and anthropometric measurements. Analysis using generalized linear models revealed that BMI was positively associated with female gender and negatively associated with age and level of education.

### **3. Methodology**

#### **Theoretical Framework**

This study is based on the Multidimensional Welfare Inequality Theory, originally proposed by Dalton (1920) and later extended by Atkinson and Bourguignon (1982). The theory argues that welfare should be assessed using multiple dimensions rather than income alone, recognizing that factors such as health, education, and income jointly determine individual well-being. It also suggests that inequality exists when these welfare outcomes are unevenly distributed across the population, even if average welfare remains unchanged. The theory supports the use of the Concentration Index (CI) and its decomposition, which enable the study to measure socioeconomic-related inequality and quantify the contribution of each determinant to overall health inequality.

#### **Data Source**

This study uses data from the Nigeria Demographic and Health Surveys (NDHS) conducted in 2008, 2013, and 2018. The NDHS are nationally representative household surveys implemented by the National Population Commission (NPC) with technical support from ICF International. The surveys employ a stratified two-stage cluster sampling design and collect detailed information on demographic characteristics, socioeconomic conditions, and health outcomes for women, men, and children. The NDHS provides the needed dataset for analysing socioeconomic health inequalities; it contains the needed information to analyse how socioeconomic factors such as wealth, education, and occupation influence health indicators.

## **Measures of Health and Socioeconomic Status**

### **Body Mass Index (BMI)**

Adult health is measured using Body Mass Index (BMI), defined as weight in kilograms divided by height in meters squared ( $\text{kg}/\text{m}^2$ ). This variable, contained in the NDHS, is an indicator of the nutritional status of an individual and is generally considered a risk factor for other health issues. Again, the World Health Organization (WHO) considers this variable in its Global Action Plan for prevention and control of non-communicable diseases. BMI is a widely used indicator of nutritional and general health status among adults and captures both undernutrition and overweight/obesity. It is computed and stored in the v445 variable expressed as BMI multiplied by 100. For our purpose, it is rescaled by dividing the value by 100 and treated as a continuous variable in this paper

### **Weight-for-Age Z-score (WAZ)**

Child health is measured using the Weight-for-Age Z-score (WAZ), which compares a child's weight to that of a healthy reference population of the same age and sex. Negative WAZ values indicate underweight status and reflect cumulative effects of undernutrition and illness. Positive scores, on the other hand, suggest the child weighs more than the average for their age. WAZ is also a widely used metric in child growth assessments to evaluate whether a child's weight is right for their age. This paper uses this variable directly, the way it was captured in the NDHS.

### **Measures of Socioeconomic status (SES)**

Socioeconomic status is proxied using three key dimensions from the DHS dataset: First, the household wealth index was employed as a composite measure of economic standing. This index ranks all households on a continuous scale of relative wealth and stratifies them into wealth quintiles of poorest, poorer, middle, richer, and richest. This is a widely used approach in DHS-based studies to examine gradients in health outcomes across economic strata (Barraza-Lloréns et al., 2013). Second, education was captured as the highest level of formal schooling attained by the respondent (or the child's mother), categorized into no education, primary, secondary, or higher education. Third, occupation was measured based on the respondent's primary employment type. To ensure analytical tractability and consistency with prior research, the original DHS occupational codes were aggregated into three categories of professional, sales/services, and manual. This aggregation follows simplification protocols established in earlier studies of health inequality (see Ataguba et al., 2019; Goli et al., 2014).

Other predictor variables were chosen based on a systematic literature review. Variables that are believed to determine health inequality are used as controls. These include: age, marital status, gender, and antenatal visits.

## Measuring Health Inequality

To assess the extent and direction of socioeconomic-related health inequality, the study first computes the Concentration Index (CI). The CI measures how a health variable is distributed across the socioeconomic ranking of the population, typically ordered from poorest to richest. Typically, CI is the standard tool for quantifying socioeconomic-related inequalities in a health measurement (Kakwani, 1977; O'Donnell et al., 2016)

Formally, the concentration index is defined as:

$$CI = \frac{2}{\mu} \text{Cov}(h_i, r_i) \quad (1)$$

where  $h_i$  is the health outcome (BMI or WAZ),  $\mu$  is its mean, and  $r_i$  is the fractional rank of individual  $i$  in the socioeconomic distribution (e.g., wealth), while  $cov$  is the covariance between health indicator and fractional rank. The CI ranges between  $-1$  and  $+1$ . A positive CI indicates that the health variable is concentrated among the better-off (pro-rich), while a negative CI indicates concentration among the worse-off (pro-poor).

The CI values are computed for each wave and for each socioeconomic variable against the health indicator to enable cross-sectional comparison across time and across dimensions of socioeconomic status. The estimations were conducted using STATA 17 statistical software, using the *conindex* command.

## Decomposing Health Gaps

After establishing the presence and direction of inequality using the CI, the study proceeds to explain the sources of health gaps using the Oaxaca–Blinder decomposition method. This technique decomposes the mean difference in a health outcome between two groups. Typically, individuals are categorised into advantaged and disadvantaged socioeconomic groups. Here, we use rich versus poor by collapsing the poorest and poorer into the poor category while collapsing richer and richest into the rich category, leaving the middle category out of the analysis. The analysis produced two components: an explained component, due to differences in observable characteristics (e.g., education, wealth, residence), and an unexplained component, due to differences in coefficients (returns to characteristics) and unobserved factors.

Let  $\bar{H}_R$  and  $\bar{H}_P$  denote the mean of the health outcomes for the rich (R) and poor (P) groups, respectively. The difference can be expressed as:

$$\bar{H}_R - \bar{H}_P = (\bar{X}_R - \bar{X}_P)\beta^* + \bar{X}_R(\beta_R - \beta^*) + \bar{X}_P(\beta^* - \beta_P) \quad (2)$$

where  $X$  represents the vector of explanatory variables and  $\beta$  the estimated coefficients. The first term captures the explained part (endowments), while the remaining terms capture the unexplained part (coefficients/structure).

In this study, Oaxaca–Blinder decomposition is applied to BMI (adult health indicator) and WAZ (children's health indicator) to quantify the contributions of education, wealth, occupation, and other demographic

controls such as place of residence, age, sex, household size, etc. This approach allows the research to move beyond identifying inequality to explaining which socioeconomic factors drive health gaps in Nigeria.

## 4. Results and Discussion of Findings

### 4.1 Presentation of Result

#### Descriptive Statistics

Descriptive statistics for the study samples across survey years are presented in Tables 1A (adults) and 4.1B (children). Among adults, the proportion of respondents classified as "Rich" increased from 44.05% in 2008 to 46.70% in 2018, reflecting a mild shift in the wealth distribution. Educational attainment improved over the decade, with the proportion of women having no education declining from 35.40% to 30.02% and those with secondary or higher education increasing. A marked occupational shift occurred, with a dramatic rise in women engaged in sales/services (32.96% to 62.34%) and a corresponding decline in manual/unskilled work. Mean BMI increased steadily from 22.56 kg/m<sup>2</sup> in 2008 to 23.88 kg/m<sup>2</sup> in 2018.

For children, a similar trend was observed: the share from the poorest households declined while those from richer quintiles increased. Maternal education improved, with a notable rise in secondary education attainment. The average WAZ remained negative across all years, though it improved slightly from -1.20 in 2013 to -1.02 in 2018. Antenatal care (ANC) visits increased modestly over time.

**Table 1: Descriptive Statistics for Adult Respondents**

| Variables                    | Category             | 2018   | 2013   | 2008   |
|------------------------------|----------------------|--------|--------|--------|
| <i>Categorical variables</i> |                      |        |        |        |
| Wealth Quintile              | Poorest              | 14.45% | 18.23% | 18.38% |
|                              | Poorer               | 18.09% | 19.07% | 18.55% |
|                              | Middle               | 20.76% | 19.23% | 19.03% |
|                              | Richer               | 22.88% | 20.65% | 20.97% |
|                              | Richest              | 23.82% | 22.83% | 23.08% |
| Education level              | No Education         | 30.02% | 37.73% | 35.40% |
|                              | Primary              | 17.39% | 17.32% | 19.87% |
|                              | Secondary            | 40.95% | 35.75% | 35.84% |
|                              | Higher               | 11.64% | 9.19%  | 8.88 % |
| Occupation                   | Professional/Skilled | 10.48% | 5.39%  | 5.39%  |
|                              | Sales/Services       | 62.34% | 38.55% | 32.96% |
|                              | Manual/Unskilled     | 27.18% | 56.07% | 61.65% |
| Marital Status               | Married              | 78.02% | 71.61% | 70.87% |
|                              | Single               | 21.98% | 28.39% | 29.13% |
| Religion                     | Islam                | 45.37% | 51.60% | 44.33% |
|                              | Christianity         | 54.00% | 46.97% | 54.22% |
|                              | Others               | 0.63%  | 1.43%  | 1.44%  |

|                             |       |                  |                  |                  |
|-----------------------------|-------|------------------|------------------|------------------|
| Residence                   | Urban | 47.85%           | 42.13%           | 35.80%           |
|                             | Rural | 52.15%           | 57.87%           | 64.20%           |
| <b>Continuous Variables</b> |       | <b>Mean (SD)</b> | <b>Mean (SD)</b> | <b>Mean (SD)</b> |
| BMI                         |       | 23.88 (5.09)     | 23.07 (4.52)     | 22.56 (4.35)     |
| Age in years                |       | 31.49 (9.10)     | 28.88 (9.68)     | 28.67 (9.47)     |
| Household Size              |       | 6.48 (3.72)      | 6.45 (3.70)      | 6.47 (3.81)      |
| Sample size                 |       | 10293            | 38175            | 32215            |

Note: Values are weighted percentages or means. Sample includes women aged 15 – 49 with valid BMI Measurements.

**Table 1B: Descriptive Statistics of Children**

| Variables                    | Category             | 2018             | 2013             | 2008             |
|------------------------------|----------------------|------------------|------------------|------------------|
| <b>Categorical variables</b> |                      |                  |                  |                  |
| HH Wealth Quintile           | Poorest              | 15.82%           | 21.73%           | 22.23%           |
|                              | Poorer               | 18.63%           | 21.53%           | 21.98%           |
|                              | Middle               | 21.50%           | 19.60%           | 19.16%           |
|                              | Richer               | 22.35%           | 18.74%           | 18.15%           |
|                              | Richest              | 21.71%           | 18.40%           | 18.47%           |
| Mother's Education           | No Education         | 32.52%           | 45.48%           | 43.76%           |
|                              | Primary              | 17.28%           | 20.11%           | 24.14%           |
|                              | Secondary            | 39.19%           | 27.98%           | 26.03%           |
|                              | Higher               | 11.02%           | 6.43%            | 6.07%            |
| Mother's Occupation          | Professional/Skilled | 9.35%            | 4.07%            | 4.09%            |
|                              | Sales/Services       | 64.48%           | 44.57%           | 37.68%           |
|                              | Manual/Unskilled     | 26.17%           | 51.35%           | 58.24%           |
| Child's Sex                  | Male                 | 51.63%           | 49.51%           | 49.52%           |
|                              | Female               | 48.37%           | 50.49%           | 50.48%           |
| Residence                    | Urban                | 47.00%           | 36.81%           | 31.44%           |
|                              | Rural                | 53.00%           | 63.19%           | 68.56%           |
| <b>Continuous variables</b>  |                      | <b>Mean (SD)</b> | <b>Mean (SD)</b> | <b>Mean (SD)</b> |
| Child's age (Years)          |                      | 1.43 (1.25)      | 1.33 (1.22)      | 1.31 (1.22)      |
| Mother's age (Years)         |                      | 30.77 (6.93)     | 29.62 (7.24)     | 29.54 (7.35)     |
| WAZ                          |                      | -1.02 (1.25)     | -1.20 (1.44)     | -1.02 (1.52)     |
| ANC Visits                   |                      | 5.62 (4.63)      | 5.56 (6.23)      | 4.69 (5.78)      |
| Sample size                  |                      | 5516             | 15438            | 11062            |

Sample restricted to children aged 0 – 59 months with valid anthropometric data.

## Measuring Socioeconomic Inequality

### Inequality in Adult BMI

Table 1B presents the CIs for BMI using wealth, education, and occupation as ranking variables across the years under investigation. The result reveals a consistent pattern of pro-rich inequality when ranking by wealth and education. The wealth-based CI increased from 0.065 ( $p<0.01$ ) in 2008, marginally increased to 0.066 ( $p<0.01$ ) in 2013 before increasing to 0.084 ( $p<0.01$ ) in 2018. This simply shows that higher BMI levels became progressively more concentrated among wealthier individuals across the years under review. Similarly, the education-based CI rose slightly from 0.046 in 2008 to 0.043 in 2013 before rising to 0.060 in 2018. Conversely, ranking by occupation yielded a pro-poor inequality, with negative CIs ranging from -0.0396 to -0.0467, suggesting that higher BMI was concentrated among individuals in lower-skilled occupational categories.

**Table 2A: BMI Inequality estimates from CI**

| Variables/years | Wealth quintile       | Education             | Occupation             |
|-----------------|-----------------------|-----------------------|------------------------|
| <b>2008 CI</b>  | 0.0652***<br>(0.0023) | 0.0461***<br>(0.0023) | -0.0396***<br>(0.0017) |
| <b>2013 CI</b>  | 0.0656***<br>(0.0152) | 0.0432***<br>(0.0039) | -0.0467***<br>(0.0190) |
| <b>2018 CI</b>  | 0.0840***<br>(0.0031) | 0.0597***<br>(0.0035) | -0.0324***<br>(0.0025) |

Notes: Standard errors in parentheses. Statistical significance: \*\*\* $p<0.01$ , \*\* $p<0.05$ , \* $p<0.1$

### Inequality in Child WAZ

Table 2A presents the CIs for child WAZ. In stark contrast to adult BMI, WAZ exhibited strong and persistent pro-poor inequality when ranked by wealth and maternal education. Specifically, the wealth-based CI was significantly negative, improving from -0.202 in 2008 to -0.171 in 2018. Similarly, the educationally ranked CI followed the same pattern, moving from -0.220 in 2008 to -0.188 in 2018. This confirms that undernutrition is disproportionately borne by children from poorer households and those whose mothers are less educated. When ranked by maternal occupation, however, a weak but significant pro-rich inequality was observed. The CI values go from -.04 (CI ~0.02–0.06).

**Table 2B: CI of WAZ by Socioeconomic Status**

| Variables/years | Wealth quintile        | Education              | Occupation             |
|-----------------|------------------------|------------------------|------------------------|
| <b>2008 CI</b>  | -0.2018***<br>(0.0120) | -0.2195***<br>(0.0105) | -0.0396***<br>(0.0017) |
| <b>2013 CI</b>  | -0.1497***<br>(0.0124) | -0.1669***<br>(0.0122) | -0.0467***<br>(0.0190) |
| <b>2018 CI</b>  | -0.1711***<br>(0.0119) | -0.1881***<br>(0.0109) | -0.0324***<br>(0.0025) |

Notes: Standard errors in parentheses. Statistical significance: \*\*\* $p<0.01$ , \*\* $p<0.05$ , \* $p<0.1$

### Oaxaca-Blinder Decomposition

To understand the mechanisms behind the socioeconomic health gaps identified, we employed the Oaxaca-Blinder decomposition. This analysis dissects the total difference in health outcomes between the “Rich” and “Poor” wealth groups into an explained component, attributable to differences in observable

endowments such as education and residence, and an unexplained component, driven by differences in the returns to these endowments or by unobserved structural factors.

### Adult BMI Inequality

From Table 3A presenting the decomposition of the adult BMI gap, the absolute BMI gap between rich and poor widened substantially over the decade, from 2.41 kg/m<sup>2</sup> in 2008 to 3.63 kg/m<sup>2</sup> in 2018. Notably, the importance of observable endowments in explaining this gap grew considerably. The explained component's share rose from 33.1% in 2008 to 60.2% in 2018, indicating that differences in the distribution of socioeconomic resources became the primary driver of BMI inequality. The result clearly shows that the major contributing endowments were education, particularly secondary and tertiary attainment, which collectively accounted for roughly 28–32% of the total gap across all years under study. Understandably, urban residence also played a significant and growing role, explaining between 7.5% and 11.1% of the disparity, likely reflecting the obesogenic environments of urban centres, characterized by easier access to energy-dense foods and more sedentary lifestyles.

**Table 3A: Oaxaca Decomposition of BMI Differences Between Rich and Poor**

| Component     | Variable  | 2018                         |               | 2013                         |               | 2008                         |               |
|---------------|-----------|------------------------------|---------------|------------------------------|---------------|------------------------------|---------------|
|               |           | Coeff<br>(SE)<br>[p-value]   | % of<br>Total | Coeff<br>(SE)<br>[p-value]   | % of<br>Total | Coeff (SE)<br>[p-value]      | % of<br>Total |
| Overall Diff. |           | -3.629<br>(0.106)<br>[0.000] | 100%          | -2.593<br>(0.050)<br>[0.000] | 100%          | -2.409<br>(0.054)<br>[0.000] | 100%          |
|               |           | -2.184<br>(0.195)<br>[0.000] | 60.20%        | -1.202<br>(0.099)<br>[0.000] | 46.30%        | -0.798<br>(0.094)<br>[0.000] | 33.10%        |
|               |           | -0.610<br>(0.134)<br>[0.000] | 16.80%        | 0.124<br>(0.050)<br>[0.013]  | -4.80%        | 0.263<br>(0.048)<br>[0.000]  | -10.90%       |
| Explained     | Age       | 0.257<br>(0.086)<br>[0.003]  | -7.10%        | -0.088<br>(0.029)<br>[0.003] | 3.40%         | -0.158<br>(0.036)<br>[0.000] | 6.60%         |
|               | Age^2     | 0.022<br>(0.013)<br>[0.093]  | -0.60%        | 0.173<br>(0.022)<br>[0.000]  | -6.70%        | 0.189<br>(0.025)<br>[0.000]  | -7.80%        |
|               | Married   | 0.078<br>(0.028)<br>[0.005]  | -2.10%        | 0.007<br>(0.003)<br>[0.020]  | -0.30%        | 0.009<br>(0.005)<br>[0.057]  | -0.40%        |
|               | Primary   | -0.541<br>(0.120)<br>[0.000] | 14.90%        | -0.499<br>(0.064)<br>[0.000] | 19.20%        | -0.402<br>(0.062)<br>[0.000] | 16.70%        |
|               | Secondary | -0.463<br>(0.080)<br>[0.000] | 12.80%        | -0.391<br>(0.034)<br>[0.000] | 15.10%        | -0.282<br>(0.034)<br>[0.000] | 11.70%        |
|               | Tertiary  |                              |               |                              |               |                              |               |

|             |               |                   |         |                   |         |                   |        |
|-------------|---------------|-------------------|---------|-------------------|---------|-------------------|--------|
|             |               | -0.099<br>(0.045) |         | -0.039<br>(0.014) |         | ~0.000<br>(0.016) |        |
|             | Prof/Skilled  | [0.028]           | 2.70%   | [0.007]           | 1.50%   | [0.992]           | 0.00%  |
|             |               | -0.106<br>(0.034) |         | -0.026<br>(0.005) |         | -0.040<br>(0.010) |        |
|             | Sales/Service | [0.002]           | 2.90%   | [0.000]           | 1.00%   | [0.000]           | 1.70%  |
|             |               | -0.038<br>(0.024) |         | -0.024<br>(0.012) |         | -0.017<br>(0.006) |        |
|             | HH Size       | [0.117]           | 1.00%   | [0.046]           | 0.90%   | [0.007]           | 0.70%  |
|             |               | -0.229<br>(0.273) |         | 0.081<br>(0.169)  |         | -0.059<br>(0.172) |        |
|             | Islam         | [0.402]           | 6.30%   | [0.631]           | -3.10%  | [0.730]           | 2.50%  |
|             |               | -0.054<br>(0.274) |         | -0.250<br>(0.174) |         | -0.120<br>(0.184) |        |
|             | Christianity  | [0.843]           | 1.50%   | [0.149]           | 9.60%   | [0.516]           | 5.00%  |
|             |               | -0.401<br>(0.094) |         | -0.270<br>(0.047) |         | -0.180<br>(0.048) |        |
|             | Rural         | [0.000]           | 11.10%  | [0.000]           | 10.40%  | [0.000]           | 7.50%  |
|             |               | -2.822<br>(0.201) |         | -1.811<br>(0.134) |         | -1.478<br>(0.135) |        |
| Unexplained |               | [0.000]           | 77.80%  | [0.000]           | 69.90%  | [0.000]           | 61.40% |
|             |               | 1.376<br>(0.258)  |         | 0.420<br>(0.159)  |         | -0.133<br>(0.155) |        |
| Interaction |               | [0.000]           | -38.00% | [0.008]           | -16.20% | [0.393]           | 5.50%  |

*Note: Standard error in parentheses while p-value is in square brackets.*

The result also shows that, despite the rising explanatory power of endowments, a large portion of the BMI gap of over 60% in all years remained unexplained. This substantial unexplained component points to the reality of deep-seated structural inequities: even when poor and rich individuals possess similar levels of education or live in similar settings, the returns on these assets, in terms of health outcomes, are systematically lower for the poor. This may reflect unmeasured factors such as the quality of dietary intake, differential exposure to stress, early-life nutritional disadvantages, or the inability to translate health knowledge into practice due to financial constraints or neighbourhood environments. The significant and growing interaction effect observed in 2013 and 2018 further suggests that the compounding disadvantage of having fewer resources and lower returns to them became a key mechanism exacerbating BMI inequality in later years.

### Child WAZ Inequality

Table 3B below explains the WAZ inequality decomposition. The rich-poor gap in child nutritional status, measured by WAZ, remained persistently large and pro-poor, ranging from -0.71 to -0.78 standard deviations. The explained component, shown to have been driven largely by maternal and household characteristics, accounted for 45–60% (across the years) of this gap, with its importance increasing to 60% by 2018. Maternal education emerged as the single most powerful determinant, explaining between 39% and 55% of the total disparity. This highlights the critical intergenerational role of female education in shaping child health through improved care practices, health-seeking behaviours and nutritional knowledge.

Access to antenatal care (ANC) was another significant contributor, explaining 6–11% of the gap. This further highlights how disparities in maternal healthcare utilization translate directly into early-life nutritional disadvantages.

While the unexplained component was relatively small in 2008 and 2013 (around 4–5%), it increased sharply to 23.8% by 2018. This notable rise indicates a growing role for structural barriers that prevent poor households from converting their resources, no matter meagre, into improved child health. Such barriers may include declining relative quality of public health services, rising real costs of nutritious foods, or persistent environmental health risks like poor water and sanitation, which disproportionately undermine the nutritional status of poor children irrespective of maternal education or ANC visits. Further to this, the large negative interaction effects in the earlier periods, which diminished by 2018, suggest that the joint burden of having fewer endowments and facing lower returns to them was initially a primary driver of inequality, before being overtaken by more generalized structural disadvantages in the most recent period.

**Table 3B: Decomposition of WAZ Between Rich and Poor**

| Component | Variable        | 2018                          |               | 2013                          |               | 2008                          |               |
|-----------|-----------------|-------------------------------|---------------|-------------------------------|---------------|-------------------------------|---------------|
|           |                 | Coeff<br>(SE)<br>[p-value]    | % of<br>Total | Coeff (SE)<br>[p-value]       | % of<br>Total | Coeff<br>(SE)<br>[p-value]    | % of<br>Total |
| Overall   | Diff.           | -0.635<br>(0.0374)<br>[0.000] | 100%          | -0.778<br>(0.0251)<br>[0.000] | 100%          | -0.712<br>(0.0316)<br>[0.000] | 100%          |
|           |                 | -0.381<br>(0.0581)<br>[0.000] |               | -0.350<br>(0.0417)<br>[0.000] |               | -0.338<br>(0.0473)<br>[0.000] |               |
|           |                 | -0.001<br>(0.0018)<br>[0.627] |               | 0.003<br>(0.0017)<br>[0.045]  |               | 0.015<br>(0.0043)<br>[0.000]  |               |
| Explained | Child Age       | 0.001<br>(0.0012)<br>[0.481]  | 0.10%         | 0.002<br>(0.0016)<br>[0.144]  | -0.40%        | -0.001<br>(0.0016)<br>[0.532] | -2.10%        |
|           |                 | -0.006<br>(0.0046)<br>[0.182] |               | -0.010<br>(0.0032)<br>[0.002] |               | -0.008<br>(0.0031)<br>[0.013] |               |
|           |                 | 0.026<br>(0.0088)<br>[0.003]  |               | -0.010<br>(0.0030)<br>[0.001] |               | -0.006<br>(0.0035)<br>[0.102] |               |
|           | Male Child      | -0.195<br>(0.0373)<br>[0.000] | -0.10%        | -0.225<br>(0.0250)<br>[0.000] | -0.30%        | -0.171<br>(0.0270)<br>[0.000] | 0.10%         |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           | Mother Age      | -0.151<br>(0.0231)<br>[0.000] | 1.00%         | -0.149<br>(0.0132)<br>[0.000] | 1.30%         | -0.109<br>(0.0149)<br>[0.000] | 1.10%         |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           | Primary Educ.   | -0.151<br>(0.0231)<br>[0.000] | -4.10%        | -0.149<br>(0.0132)<br>[0.000] | 1.20%         | -0.109<br>(0.0149)<br>[0.000] | 0.80%         |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           | Secondary Educ. | -0.151<br>(0.0231)<br>[0.000] | 30.80%        | -0.149<br>(0.0132)<br>[0.000] | 28.90%        | -0.109<br>(0.0149)<br>[0.000] | 24.00%        |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           | Tertiary Educ.  | -0.151<br>(0.0231)<br>[0.000] | 23.90%        | -0.149<br>(0.0132)<br>[0.000] | 19.20%        | -0.109<br>(0.0149)<br>[0.000] | 15.30%        |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |
|           |                 | -0.151<br>(0.0231)<br>[0.000] |               | -0.149<br>(0.0132)<br>[0.000] |               | -0.109<br>(0.0149)<br>[0.000] |               |

|               |                    |        |                    |        |                    |        |
|---------------|--------------------|--------|--------------------|--------|--------------------|--------|
|               | -0.014<br>(0.0124) |        | 0.005<br>(0.0070)  |        | 0.004<br>(0.0093)  |        |
| Prof/Skilled  | [0.263]            | 2.20%  | [0.450]            | -0.70% | [0.653]            | -0.60% |
|               | -0.007<br>(0.0110) |        | 0.007<br>(0.0051)  |        | -0.008<br>(0.0098) |        |
| Sales/Service | [0.553]            | 1.10%  | [0.154]            | -0.90% | [0.418]            | 1.10%  |
|               | 0.019<br>(0.0284)  |        | 0.112<br>(0.0228)  | -      | -0.011<br>(0.0268) |        |
| Urban         | [0.505]            | -3.00% | [0.000]            | 14.40% | [0.685]            | 1.50%  |
|               | -0.053<br>(0.0213) |        | -0.087<br>(0.0182) |        | -0.045<br>(0.0238) |        |
| ANC Visits    | [0.014]            | 8.30%  | [0.000]            | 11.20% | [0.061]            | 6.30%  |
|               | -0.151<br>(0.0978) |        | -0.030<br>(0.1105) |        | -0.033<br>(0.1069) |        |
| Unexplained   | [0.122]            | 23.80% | [0.786]            | 3.90%  | [0.757]            | 4.60%  |
|               | -0.103<br>(0.1079) |        | -0.397<br>(0.1155) |        | -0.341<br>(0.1126) |        |
| Interaction   | [0.340]            | 16.20% | [0.001]            | 51.10% | [0.002]            | 47.90% |

*Note: Standard error in parentheses while p-value is in square brackets.*

## 4.2 Discussion of the findings

Our findings reveal two starkly contrasting patterns of inequality: a pro-rich gradient in adult BMI and a pro-poor gradient in child WAZ. This dual burden of malnutrition- overnutrition among the affluent and undernutrition among the disadvantaged, indicates how complex and bidirectional health inequality in a transitioning economy like Nigeria is. The persistent pro-rich concentration of adult BMI aligns with the nutrition transition theory (Popkin, 2000), which posits that rising incomes and urbanization are associated with shifts toward diets high in fats, sugars and processed foods, coupled with more sedentary lifestyles. Our results show that this transition in Nigeria has been inequitable; the benefits (or risks) of economic change have accrued disproportionately to wealthier, more educated and urban populations. The growing contribution of the explained endowment effect particularly education and urban residence to the BMI gap suggests that socioeconomic stratification has become increasingly encoded in health behaviours and environments. This finding resonates with studies in other LMICs where similar pro-rich gradients in obesity have been shown to be prevalent alongside economic growth (Neuman et al., 2011; Ni Mhurchu et al., 2004). However, the large and persistent unexplained component points to the fact that, beyond unequal access to resources, there are systemic differences in how these resources are converted into health. This may reflect differential returns to human capital, where education and income for the poor do not translate into the same health benefits due to contextual barriers like food deserts, unsafe neighbourhoods limiting physical activity, or psychosocial stress associated with economic insecurity (Cutler et al., 2003).

In stark contrast, child undernutrition (WAZ) exhibits a strong and persistent pro-poor bias. This result is consistent with the vast literature on the social determinants of child health, which emphasizes the primacy of maternal education and household economic resources (Victora et al., 2021). Our decomposition analysis on WAZ also confirms that maternal education is the single most important observable factor driving the WAZ gap, accounting for over half of the explained inequality by 2018. This shows the critical role of

women's empowerment and education in breaking intergenerational cycles of malnutrition, as educated mothers are more likely to practice appropriate child feeding, utilize health services and have greater role in household decision-making (Bhutta et al., 2013). The significant contribution of antenatal care visits further underscores the importance of maternal healthcare access as a pathway to equitable child health outcomes. The sharp increase in the unexplained component of the WAZ gap by 2018 is a concerning finding. It suggests that the structural barriers preventing poor households from improving child nutrition are intensifying, even as some endowments like maternal education improve. This may be driven by systemic failures in public service delivery, including declining quality of primary healthcare, ineffective nutrition-sensitive programs, or economic shocks that erode the purchasing power of the poor (Forster et al., 2020). It also points to possible environmental and sanitation challenges that disproportionately affect poor children, such as recurrent diarrheal diseases from unsafe water, which undermine nutrient absorption and linear growth regardless of dietary intake (Danaei et al., 2016). This growing return gap indicates that policies focusing solely on increasing endowments (e.g., building more schools or clinics) may be insufficient without simultaneously addressing the quality, affordability, and contextual effectiveness of these services for the most vulnerable.

## **5. Conclusion and Recommendation**

### **5.1 Conclusion**

This study has systematically investigated the socioeconomic determinants of health inequality in Nigeria over a critical decade (2008–2018), employing a dual-outcome framework to compare disparities in adult and child nutritional status. Through CI and Oaxaca-Blinder decomposition analyses, the research provides a nuanced diagnosis of how wealth, education and occupation shape health outcomes in opposite directions across the life course.

The evidence confirms a persistent and growing pro-rich inequality in adult BMI, driven increasingly by disparities in educational attainment and urban residence, alongside substantial unexplained structural barriers that limit the health returns to socioeconomic assets among the poor. Concurrently, the analysis reveals a deep and enduring pro-poor inequality in child WAZ, predominantly explained by maternal education and access to antenatal care, yet increasingly compounded by systemic failures that prevent poor households from translating resources into child health gains.

### **5.2 Recommendation**

The findings of this study therefore point to several priority areas for policy action:

- a) To improve maternal and child health outcomes by expanding equitable access to quality education for girls and women, while strengthening the quality, affordability, and cultural appropriateness of maternal and child healthcare services.
- b) To reduce health inequalities by promoting comprehensive nutrition and preventive public health interventions, while addressing the underlying socioeconomic and environmental determinants of health, including poverty, water and sanitation, urban planning, and social protection.

## **References**

- Adeyanju, O., Tubeuf, S., & Ensor, T. (2017). Socio-economic inequalities in access to maternal and child healthcare in Nigeria: Changes over time and decomposition analysis. *Health Policy and Planning*, 32(8), 1111–1118. <https://doi.org/10.1093/heapol/czx049>
- Akombi, B. J., Agho, K. E., Hall, J. J., Merom, D., Astell-Burt, T., & Renzaho, A. M. N. (2017). Stunting and severe stunting among children under-5 years in Nigeria: A multilevel analysis. *BMC Pediatrics*, 17(1), 15. <https://doi.org/10.1186/s12887-016-0770-z>
- Anteneh, R. M., Moges, N., Gebeyehu, A. A., Anley, D. T., Chanie, E. S., Tsega, S. S., Dessie, A. M., Zemene, M. A., et al. (2025). Wealth-related inequalities in undernutrition among under-five children in sub-Saharan Africa. *Scientific Reports*, 15, Article 19010
- Arcaya, M. C., Arcaya, A. L., & Subramanian, S. V. (2015). Inequalities in health: Definitions, concepts, and theories. *Global Health Action*, 8(1), 27106. <https://doi.org/10.3402/gha.v8.27106>
- Ataguba, J. E., Ichoku, H. E., Nwosu, C. O., & Akazili, J. (2020). An alternative approach to decomposing the redistributive effect of health financing between and within groups using the Gini Index: the case of out-of-pocket payments in Nigeria. *Applied Health Economics and Health Policy*, 18(6), 747–757.
- Atkinson, A. B., & Bourguignon, F. (1982). The comparison of multi-dimensioned distributions of economic status. *The Review of Economic Studies*, 49(2), 183–201.
- Atsu, P., Mohammed, A., Adu, C., Aboagye, R. G., Ahinkorah, B. O., & Seidu, A. A. (2024). Residence-based inequalities in overweight/obesity in sub-Saharan Africa: a multivariate non-linear decomposition analysis. *Tropical Medicine and Health*, 52(1), 29.
- Bambra, C., Riordan, R., Ford, J., & Matthews, F. (2020). The COVID-19 pandemic and health inequalities. *J Epidemiol Community Health*, 74(11), 964–968.
- Barraza-Lloréns, M., Panopoulou, G., & Díaz, B. Y. (2013). Income-related inequalities and inequities in health and health care utilization in Mexico, 2000–2006. *Revista Panamericana de Salud Pública*, 33(2), 122–130. <https://doi.org/10.1590/S1020-49892013000200007>
- Bartley, M. (2017). *Health inequality: An introduction to theories, concepts, and methods* (2nd ed.). Polity Press.
- Bhutta, Z. A., Ahmed, T., Black, R. E., Cousens, S., Dewey, K., Giugliani, E., ... & Shekar, M. (2008). What works? Interventions for maternal and child undernutrition and survival. *The Lancet*, 371(9610), 417–440.
- Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., ... & Uauy, R. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890), 427–451. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X)
- Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *Journal of Human Resources*, 8(4), 436–455. <https://doi.org/10.2307/144855>
- Bommier, A., & Stecklov, G. (2002). Defining health inequality: why Rawls succeeds where social welfare theory fails. *Journal of Health Economics*, 21(3), 497–513.
- Cutler, D. M., Glaeser, E. L., & Shapiro, J. M. (2003). Why have Americans become more obese? *Journal of Economic Perspectives*, 17(3), 93–118.
- Dardanoni, V., & Wagstaff, A. (1987). Uncertainty, inequalities in health and the demand for health. *Journal of Health Economics*, 6(4), 283–290.
- Elo, I. T. (2009). Social class differentials in health and mortality: Patterns and explanations in comparative perspective. *Annual Review of Sociology*, 35(1), 553–572.
- Erikson, R., & Goldthorpe, J. H. (1992). *The constant flux: A study of class mobility in industrial societies*. Oxford University Press.
- Eze, J. N., Odum, C. U., Onwe, D. G., & Njoku, C. H. (2021). Socio-demographic determinants of body mass index among school children in Ebonyi State, Nigeria. *Pan African Medical Journal*, 38, 254.
- Fatukasi, A. A., & Ayeomoni, I. O. (2015). Effect of Income Inequality on Health Indicators in Nigeria (1980–2014). *International Journal of Academic Research in Business and Social Sciences*, 5(8), 274–285.

- Flegal, K. M., Kit, B. K., Orpana, H., & Graubard, B. I. (2012). Association of all-cause mortality with overweight and obesity using standard body mass index categories: A systematic review and meta-analysis. *JAMA*, 309(1), 71–82.
- Goldthorpe, J. H. (2016). *Sociology as a Population Science*. Cambridge University Press.
- Goli, S., Singh, L., Jain, K., & Pou, L. M. A. (2014). Socioeconomic Determinants of Health Inequalities Among the Older Population in India: A Decomposition Analysis. *Journal of Cross-Cultural Gerontology*, 29(4), 353–369. <https://doi.org/10.1007/s10823-014-9251-8>
- Gouda, H. N., Charlson, F. J., Sorsdahl, K., Ahmadzade, S., Ferrari, A. J., Erskine, H. E., ... & Whiteford, H. A. (2019). Burden of non-communicable diseases in sub-Saharan Africa, 1990–2017. *The Lancet Global Health*, 7(10), e1375–e1387. [https://doi.org/10.1016/S2214-109X\(19\)30374-2](https://doi.org/10.1016/S2214-109X(19)30374-2)
- Hanibuchi, T., Nakaya, T., & Honjo, K. (2016). Trends in socioeconomic inequalities in self-rated health, smoking, and physical activity of Japanese adults from 2000 to 2010. *SSM - Population Health*, 2, 662–673. <https://doi.org/10.1016/j.ssmph.2016.09.002>
- Hoffmann, R., Kröger, H., & Geyer, S. (2019). Social causation versus health selection in the life course: Does their relative importance differ by dimension of SES? *Social Indicators Research*, 141(3), 1343–1368.
- Hoffmann, R., Kröger, H., & Geyer, S. (2019). Social causation versus health selection in the life course: Does their relative importance differ by dimension of SES? *Social Indicators Research*, 141(3), 1343–1368.
- Ke, Y., Zhang, S., Hao, Y., & Liu, Y. (2023). Associations between socioeconomic status and risk of obesity and overweight among Chinese children and adolescents. *BMC Public Health*, 23, 15290.
- Khang, Y.-H., & Cho, H.-J. (2006). Socioeconomic inequality in cigarette smoking: Trends by gender, age, and socioeconomic position in South Korea, 1989–2003. *Preventive Medicine*, 42(6), 415–422. <https://doi.org/10.1016/j.ypmed.2006.02.010>
- Marmot, M., Friel, S., Bell, R., Houweling, T. A., & Taylor, S. (2008). Closing the gap in a generation: health equity through action on the social determinants of health. *The Lancet*, 372(9650), 1661–1669.
- Marume, A., Kasanzu, S., & Chirenda, J. (2025). Socio-economic and rural-urban disparities in the double burden of childhood malnutrition in sub-Saharan Africa. *Journal of Health, Population and Nutrition*, 44, 335.
- Mirowsky, J., & Ross, C. E. (2003). Education, social status, and health. *Aldine de Gruyter*.
- Moh'd, R. U., Ilemona, A., & Abdulganiyu, S. (2025). Socioeconomic Inequality and Body Mass Index in Nigeria: Evidence from Demographic Health Surveys. *Confluence Journal of Social Sciences*, 1(2).
- Morris, S., Sutton, M., & Gravelle, H. (2005). Inequity and inequality in the use of health care in England: An empirical investigation. *Social Science & Medicine*, 60(6), 1251–1266. <https://doi.org/10.1016/j.socscimed.2004.07.016>
- National Bureau of Statistics. (2020). *National health survey 2020: Key findings*. <https://www.nigerianstat.gov.ng/>
- Neuman, M., Finlay, J. E., Davey Smith, G., & Subramanian, S. V. (2011). The poor stay thinner: Stable socioeconomic gradients in BMI among women in lower- and middle-income countries. *American Journal of Clinical Nutrition*, 94(5), 1348–1357. <https://doi.org/10.3945/ajcn.111.018127>
- O'Donnell, O., Van Doorslaer, E., Rannan-Eliya, R. P., Somanathan, A., Adhikari, S. R., Akkazieva, B., ... & Zhao, Y. (2008). Who pays for health care in Asia?. *Journal of Health Economics*, 27(2), 460–475.
- Oaxaca, R. L. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, 14(3), 693–709. <https://doi.org/10.2307/2525981>
- Okoli, C., Hajizadeh, M., Rahman, M. M., & Khanam, R. (2020). Geographical and socioeconomic inequalities in the utilization of maternal healthcare services in Nigeria: 2003–2017. *BMC Health Services Research*, 20, 1–14.
- Oyan, B., & Ndu-Akinla, C. (2023). Sociodemographic determinants of overweight and obesity in adults attending a tertiary hospital in Rivers State, Nigeria. *Nigerian Journal of Medicine*, 32(3).
- Popkin, B. M., Corvalan, C., & Grummer-Strawn, L. M. (2020). Dynamics of the double burden of malnutrition and the changing nutrition reality. *The Lancet*, 395(10217), 65–74.

- Ramesh, N., Cockbain, B., Taylor, G. P., & Rosadas, C. (2024). How do socioeconomic determinants of health affect the likelihood of living with HTLV-1 globally? A systematic review with meta-analysis. *Frontiers in Public Health*, 12, 1298308. <https://doi.org/10.3389/fpubh.2024.1298308>
- UNESCO (2021). Education: From disruption to recovery. Retrieved from <https://en.unesco.org>
- United Nations Development Programme (UNDP) (2020). *Human Development Report 2020: The Next Frontier—Human Development and the Anthropocene*. UNDP. Retrieved from <https://hdr.undp.org>
- United Nations International Children's Emergency Fund (UNICEF) (2021). Progress for children and women in Sub-Saharan Africa: Annual report. Retrieved from <https://www.unicef.org>
- Vale, D., Andrade, M. E. C., Dantas, N. M., Bezerra, R. A., Lyra, C. O., & Oliveira, A. G. R. C. (2022). Social determinants of obesity and stunting among Brazilian adolescents: A multilevel analysis. *Nutrients*, 14(11), 2334.
- Victora, C. G., Christian, P., Vdaletti, L. P., Gatica-Domínguez, G., Menon, P., & Black, R. E. (2022). Revisiting maternal and child undernutrition in low-income and middle-income countries: Variable progress towards an unfinished agenda. *The Lancet*, 399(10331), 1388-1399. [https://doi.org/10.1016/S0140-6736\(22\)00303-0](https://doi.org/10.1016/S0140-6736(22)00303-0)
- Wilkinson, R. G., & Pickett, K. E. (2017). Income inequality and population health: A review and explanation of the evidence. *Social Science & Medicine*, 62(7), 1768-1784. <https://doi.org/10.1016/j.socscimed.2006.06.014>
- Wolfe, R., Harknett, K., & Schneider, D. (2021). Inequalities at work and the toll of COVID-19. *Health Affairs Health Policy Brief*, 4(10.1377).
- Wolff, E. (1995). Top heavy: A study of wealth inequality in America. *Twentieth Century Fund*, New York.
- World Health Organization (2021). *World health statistics 2021*. <https://www.who.int/data/gho/publications/world-health-statistics>