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A Quantitative Analysis of Determinants of Child and Maternal Malnutrition in Nigeria

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Malnutrition rates among children 0 to 36 months and women of reproductive age in Nigeria are high and vary significantly across rural-urban locations, geopolitical zones, and agro-ecological zones, thereby constituting a significant public health challenge. Using the 2003 National Demographic Health Survey (NDHS) data, this brief discusses the key determinants of child and maternal nutrition in Nigeria across these different zones.

Introduction

Many studies have confirmed the significant variations in the level of malnutrition across rural-urban settings, geopolitical zones, and broad agro-ecological bands in Nigeria. Generally, these studies agree that the hungry and malnourished tend to be located primarily in rural agricultural areas and that hunger and malnutrition are more acute among the landless, pastoralists, smallholders, and hired agricultural workers. However, these studies are essentially descriptive in nature and lack detailed analysis of socioeconomic and proximate determinants of child and maternal malnutrition in the various geopolitical zones and agro-ecological bands that would more effectively guide policy interventions in these areas.

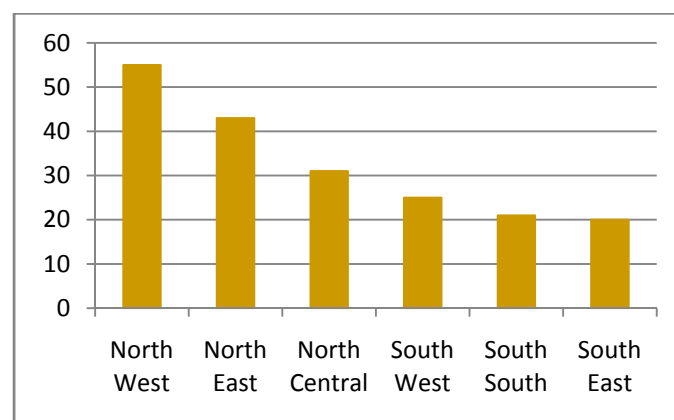
Using data from the 2003 Nigeria Demographic and Health Survey (NDHS), this analysis deepens the understanding of determinants of nutritional status of children 0 to 3 years old and adult women of gestational age in rural and urban households.

Child and Maternal Nutrition in Nigeria

The 2003 NDHS shows that 38 percent of Nigerian children under the age of five years are stunted, 29 percent are underweight, and 9.2 percent are wasted (NPC/ORC Macro 2004). The Nigerian

Food Consumption and Nutrition survey (NFCN 2001-2003) reported similar trends with 42 percent stunted, 25 percent underweight, and 9 percent wasted (Maziya-Dixon et al. 2004). Significant variations were reported across rural and urban regions, geopolitical zones, and agro-ecological bands. The 2003 NDHS showed that rural children (43 percent stunted) are disadvantaged compared to urban children (29 percent stunted) and children living in the North West geopolitical zone are particularly disadvantaged (Figure 1).

Figure 1: Percent of Children Stunted by Geopolitical Zone



Among the three broad agroecological zones used in the NFCNS 2001-2003, the stunting rate was 58

percent in the dry savannah, about 46 percent in the moist savannah, and 27 percent in the humid forest zone. Similar patterns were reported for underweight and wasting.

Data and Model

The 2003 NDHS data is a nationally representative sample of over 7000 households with reference to over 7000 women of age 15 to 49 years and over 4000 children under five years of age with complete and plausible anthropometric data. The NDHS data set was selected for its national representativeness and its comparability across countries and within Nigeria over time (Nigeria DHS for 1990, 1993, 2003, and 2008).

The model is guided by the UNICEF (1990) conceptual framework for the causes of child malnutrition as well as variables of considerable interest for policymaking and interventions. Although the UNICEF conceptual framework is comprehensive, incorporating both biological and socioeconomic causes of malnutrition at several levels, this model focuses on the underlying determinants of maternal and child nutrition as the socioeconomic, demographic, and biological variables available within the NDHS dataset fits better with this level of the framework.

Dependent Variables

For the child models, the Z-score¹ of the height for age of the child was used. Height for age more than two standard deviations below the NCHS/ CDC/ WHO reference height reflects growth failure and serves as the best general proxy for constraints to human welfare of the poorest, including dietary inadequacy, infectious diseases, and other environmental health risks (Beaton 1990, Baghiigwa and Younger 2005).

For the women's model, the Body Mass Index (BMI) is used to reflect the nutritional status of mothers. Some evidence in developing countries

indicates that malnourished women, with a BMI below 18.5, show a progressive increase in mortality rates as well as increased risk of illness (Girma and Genebo 2002).

Independent Variables

A number of broad-range independent variables were considered, including:

- Wealth Index,
- Occupation of household head and women,
- Age and sex of household head, household size, and percent of children under five,
- Age of mother, highest educational level, marital status, and decisionmaking on mother's earning,
- Mother attending antenatal care, place of child delivery, birth interval, and child receiving vaccination (BCG),
- Early initiation of breastfeeding and feeding solid, semi-solid, and soft foods to infants and young children, and
- Access to water and toilet facilities, problems accessing health care, child receiving vitamin A, and child based characteristics.

Research Findings

Significant variations exist in the level of child and maternal malnutrition across rural-urban settings, geopolitical zones, and broad agro-ecological bands in Nigeria. Malnutrition rates are higher among rural households who depend more on agriculture than on other sectors for their livelihoods.

The results indicate that generally, across rural and urban areas, **household economic status** is significantly and positively associated with child nutrition, though the effect is limited. Its impact is found in rural North East and the southern region², and in urban areas of the North East and North West. Across the agroecological zones, economic

¹ The Z-score of a child being measured is the number of standard deviations (of the reference population) the child is away from the median height of the reference population at that age.

² Results indicate that there are no significant differences among the three southern regions (South East, South, and South West), therefore, these regions are combined to form the southern region.

status is found to have similar level of effects in the Sudano-Sahelian savanna, and humid forest zone.

Household economic status also has a positive association with respect to maternal nutrition in the rural and urban areas. This is specifically significant in the rural North Central and the southern regions, and in all the urban regions, except the North East, as well as across all the rural and urban areas of the agroecological zones. Although relatively weak in effect, the consistency and wide reach of the effect of household economic status indicates its relative importance to child and maternal nutrition.

Although the **primary engagement of household heads in agriculture** is related to their household socioeconomic status, the negative and significant effect of this work status on child and maternal nutrition is established, after controlling for the effect of household economic status. The results amply indicate that the negative effect of household heads being primarily engaged with agriculture on child growth is particularly a rural phenomenon, especially in North Central, the southern regions, and the humid forest zone.

Another variable that relates to wealth or income, **mother working to generate income**, has a positive effect on height for age of children in rural areas, and specifically in rural North Central and North West. It also has a significant and positive effect in rural Sudano-Sahelian, Guinea savanna, and in the urban humid forest zone. The effect of maternal work on the mother's own nutritional well-being is high, positive, and significant in rural areas generally, and specifically in rural North East, the southern regions, and in rural Guinea, with no significant effect in the urban areas of the geopolitical zones and agroecological bands. This indicates that allowing mothers to work to earn their own income would substantially contribute to the reduction of child malnutrition in the zones and bands.

Maternal education appears to be the determinant with the highest potential of reducing child malnutrition, especially in urban areas of the North Central, North West, and North East. A mother with secondary education is associated with her children having substantial increase in height for age in rural

Guinea savanna and in urban Sudano-Sahelian savanna. While maternal education affects child malnutrition more in the urban northern regions, its effect on maternal nutrition is associated more with the rural northern zones and bands, especially the rural North East and North West.

Other significant maternal and child related characteristics and public health factors include age of mother, age of child, being a female child, immunization (BCG) vaccinations, and distance as a constraint to accessing or using basic health services. The significant and negative effect of age of child on child nutritional status is almost universal, cutting across almost all rural and urban regions and agroecological zones as nutritional status is found to deteriorate with age. The results confirm that the stunting rate is lowest when a child is under 6 months old, increases significantly after 6 months of age, and peaks after age 1 into age 2. For children 6 to 36 months, our results indicate that dietary diversity and increased daily meal frequencies hold strong potentials for improved child nutrition.

Policy Implications

The independent effects of household economic status, household head being primarily engaged in agriculture, and maternal work to earn income, combine to indicate that efforts to improve livelihoods are central to improving nutritional status especially in rural areas.

High malnutrition rates among agriculture dependent households reflect challenges facing rural farmers in Nigeria that include: low incomes, constraints to optimum access to inputs, market uncertainties that act as disincentives to increased investment in agriculture, poor rural infrastructure, and poor agricultural policy implementation.

Women's education at various levels is important to improve both child and maternal nutrition. While strengthening efforts to increase overall enrollments and quality of education nationally, the range of barriers that have substantially limited generations of women and girls, especially in North East and North West and in the Sudano-Sahelian and Guinea savannas, need to be identified and

addressed as a matter of highest development priority.

Current efforts to effectively implement the Integrated Maternal, Newborn, and Child Health Strategy must be sustained to achieve its objectives.

This brief is excerpted from a NSSP background paper “A Quantitative Analysis of Determinants of Child and Maternal Malnutrition in Nigeria.” This brief was written with the assistance of James Sackey and Valerie Rhoe. It is intended to promote discussion; it has not been formally peer reviewed, but it has been reviewed by at least one internal and/or external reviewer.

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