



POLICY  
BRIEF

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# India-Africa in G21: The Challenge of Nutrition Security

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## African Union's Integration into the G20: Key Challenges Ahead

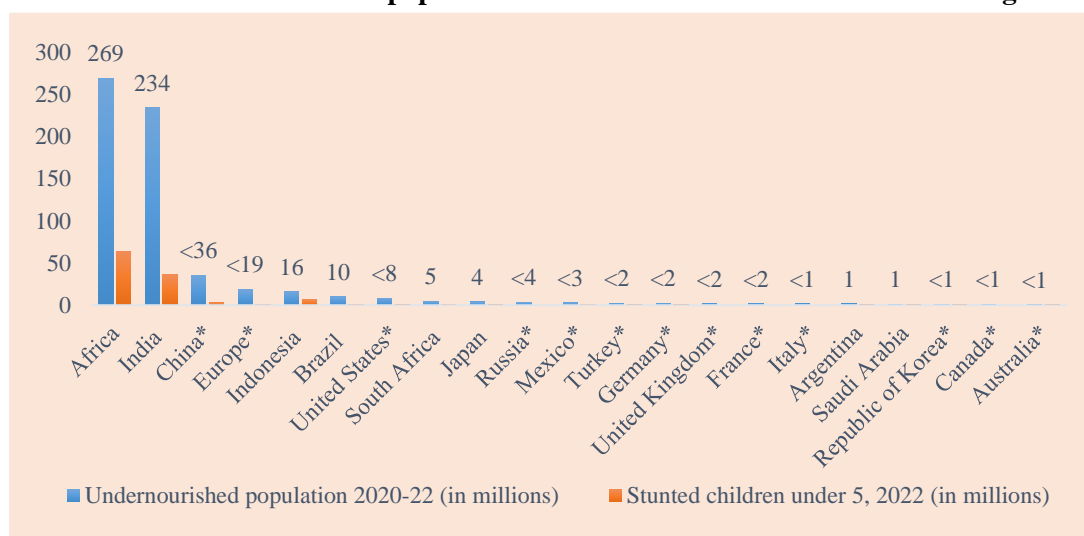
One of the hallmarks of India's G20 presidency is inclusion of African Union (AU) as a permanent member of G20. The group may now be called G21. By bringing in AU in G21, India has ensured that the voice of Global South is put firmly upfront. AU comprises of 55 countries and 1.4 billion people on this planet. Now the new G21 will represent 84 percent of global population, bringing it closer to the motto of 'One Earth, One Family, One Future'.

India and Africa within the new G21 face similar challenges. They both have low per capita income, persistent poverty, widespread undernourishment, which gets acute with relatively high rates of population growth. Moreover, their economic structure, sectoral composition, and internal heterogeneity, etc. can make the comparison between India and Africa an interesting study for mutual south-south learning.

India and Africa together constitute around 36 percent of the global population. By 2050, the population of Africa will account for more than one-fourth of the world population (WPP, 2022). Just as in India, so in Sub-Saharan Africa comprising of 48 countries, large segment of population (around 424 million) lived in extreme poverty in 2019. That is, about three-quarters of the world's poor live in Africa and India together (World Bank, 2021).

Achieving the Sustainable Development Goals (SDG) 2 of zero hunger and SDG 3 of ensuring healthy lives and promoting well-being of all by 2030 are big challenges for both India and Africa. As per the latest report on 'The State of Food Security and Nutrition in the World' (2023), about 69.4 percent (503 million out of 725.1 million) of the world's undernourished people were in India and Africa in 2020-22 (FAO et al. 2023) (**Figure 1**).

**Figure 1: Number of undernourished population and stunted children under five among G21 members**



Source: FAO, IFAD, UNICEF, WFP & WHO, 2023

Note: \*Estimated using WPP 2022. Countries have <2.5 percent of their population as undernourished. Data for stunted children not reported for France, UK, Canada, Russia, and Italy.

As a proportion of their own populations, the prevalence of undernourishment was about 16.6 percent and 19.3 percent in India and Africa, respectively during 2020-22. However, within Africa, the Sub-Saharan Africa reported a higher prevalence of 22.1 percent of its total population

being undernourished. In comparison, other emerging economies of G21, had much lower percentage of their respective populations as malnourished. For example, China had 2.5 percent, Brazil 4.7 percent, Indonesia 5.9 percent, and South Africa 7.9 percent (FAO et al. 2023).

Unfortunately, India and Africa are also home to 67.0 percent of world's stunted (low height-for-age) and 75.8 percent of the world's wasted children (low weight-for-height) under five years of age in 2022. However, as a percentage of their own population of children below the age of five, the African continent had 30.0 percent and India 31.7 percent as stunted in 2022 as per the FAO et al. (2023).

In terms of under-five deaths, India, and Sub-Saharan Africa account for 71.8 percent (3.6 million) of the world's under-five deaths in 2022. Incidentally, India had the largest number of under-five deaths before Nigeria reported a larger number of deaths in that age group in 2019 (UNICEF, 2022).

Africa's and India's commitment to bring down undernourishment and malnutrition among children has global significance as the two account for the largest chunk in the global numbers. Moreover, the

global crises of the COVID-19 pandemic, climate change, and geopolitical conflicts have jeopardised progress made towards achieving the SDGs.

### What are the trends in child's nutrition and mortality indicators in India?

Assessing India's progress on improving nutrition security and mortality rates can help in identifying the factors that need focused interventions. Such analysis may also help in south-south learning on this issue, though more in-depth research needs to be conducted between different countries of African Union and Indian states, as many countries in African Union are of a size of one or the other state in India. For example, most populous state in India, namely Uttar Pradesh has a population of 236 million (Census projections for 2023) that is higher than the most populous country in Sub-Saharan Africa, namely Nigeria with 224 million.

**Table 1: Trends in the nutrition and mortality indicators among Indian children**

Indicators	NFHS-3	NFHS-4	NFHS-5	Per year Decline (%)		
	2005-06	2015-16	2019-21	NFHS-3 to 4	NFHS-4 to 5	NFHS 3 to 5
Underweight (%) (Low weight-for-age)	42.5	35.8	32.1	0.61	0.74	0.69
Stunted (%) (Low height -for-age)	48.0	38.4	35.5	0.87	0.58	0.83
Wasted (%) (Low weight-for-height)	19.8	21.0	19.3	-0.11	0.34	0.03
Anemic (age 6-59 months)	69.4	58.6	67.1	0.98	-1.70	0.15
IMR (deaths per 1,000 live births)	57.0	40.7	35.2	1.48	1.10	1.45

Source: NFHS-3, 4 & 5.

Note: Nutrition indicator for children under 5 years of age are based on the new WHO reference population

As per the latest National Family Health Survey (NFHS) 2019-21, the nutrition indicators for children under five years of age have improved over the last 15 years. Stunting has reduced from 48.0 to 35.5 percent, wasting from 19.8 to 19.3 percent and underweight prevalence from 42.5 to 32.1 percent during 2005-06 and 2019-21 (**Table 1**). Several research studies have highlighted a strong correlation between malnutrition and childhood mortality

indicators. India has made remarkable progress in reducing its infant mortality rate (IMR) from 57 to 35.2 deaths per 1000 live births during the period from 2005-06 to 2019-21. Yet, in spite of the progress made in reducing the child mortality rate, malnutrition indicators have not improved as substantially. This distressing situation creates a vicious cycle in which children surviving childhood mortality add to the pool of malnourished children. It

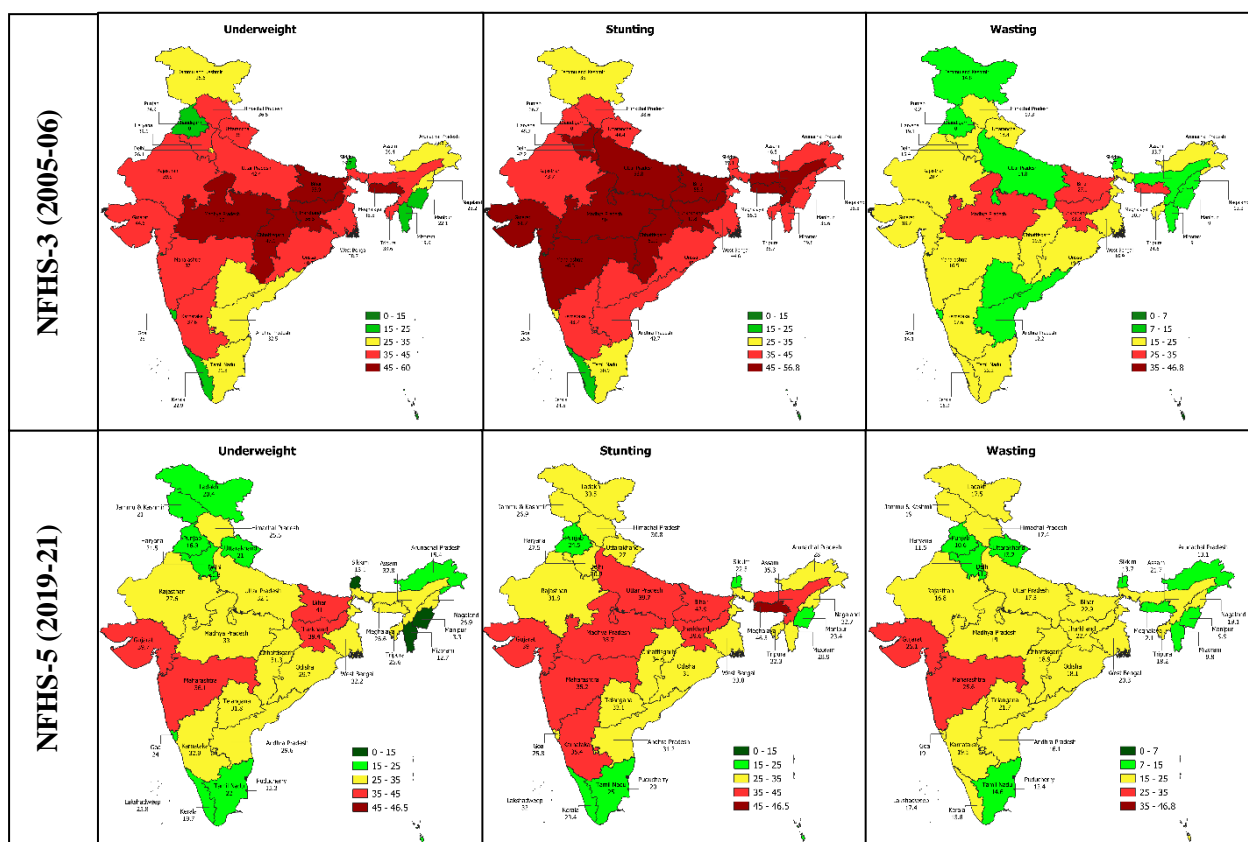
is, thus, imperative to lower the level of child mortality even more so as to effectively combat malnutrition.

Despite a reasonable progress in nutritional outcomes at the all-India level, there exists a wide inter-state variation across the malnutrition indicators. In many states more than one-third of children under the age of five, are undernourished even today. As per the NFHS-5, more than 35 percent of children in Assam, Chhattisgarh, Karnataka, Bihar, Jharkhand, Gujarat,

Madhya Pradesh, Uttar Pradesh, and Meghalaya were stunted in 2019-21 (**Figure 2**).

Over-temporal comparison over the last 15 years shows that states such as Madhya Pradesh, Chhattisgarh, Arunachal Pradesh, Haryana, Meghalaya, and Uttarakhand have performed commendably in reducing stunting and the number of children that are underweight.

**Figure 2: State-wise comparison of nutritional status of children, 2005-06 to 2019-21**



Source: NFHS-3 & 5. Note: Map illustration by Rahul Arora using QGIS

### What are the factors that impact malnutrition among children in India?

The UNICEF's conceptual framework classifies the key determinants of malnutrition as basic, underlying, and immediate factors. A number of studies also lay emphasis on the inclusion of nutritional interventions for addressing immediate and underlying determinants (Black et al. 2008, Menon et al. 2018). Household food security and access to a nutritious diet capture only one aspect of

malnutrition. Adequate care, a healthy household environment, access to health care services and socio-economic factors should be given equal priority in combating malnutrition. Therefore, India needs a set of multi-pronged strategies to tackle the multi-dimensional problem of undernutrition.

To empirically determine factors impacting malnutrition in India, we use logit regression on the unit level data for children under the age of 5 years from NFHS-3 (2005-06), NFHS-4 (2015-16), and

NFHS-5 (2019-21).<sup>1</sup> **Table 2** (see annexure) presents the logit estimates for all three rounds, however, we will discuss only the NFHS-5 results in this section for brevity.

The dependent variable assumes 0 if the child's anthropometric indicator is more than median -2 SD (no malnutrition) and 1 if the child's anthropometric indicator is less than -2 SD which is measured by underweight (low weight-for-age), stunting (low height-for-age) and wasting (low weight-for-height).

The independent variables used in the logit regression include immediate determinates such as mother's BMI index, duration of breastfeeding, and consumption of nutritious food (including green leafy vegetables, fruits, milk, and milk products). The second set of factors are nutrition and health care interventions such as number of antenatal visits during pregnancy, iron folic acid (IFA) supplements taken during pregnancy, place of delivery and the underlying factors include mother's education, and access to improved sanitation and drinking water sources.

Among all the dependent variables, the association between the mother's education level and the probability of the child being underweight and stunted under five years of age is the strongest and statistically significant. Higher education among women strongly correlates with women's autonomy in decision-making, sanitation and hygiene, and child-caring practice (Jose et al. 2020). For children under five years, whose mothers have higher education levels (12 years or more) have lower log odds of being underweight (-0.63), stunted (-0.77) and wasted (-0.27), as compared to those of mothers with education up to the secondary and primary level.

The second most important variable that had a significant impact on child malnutrition indicators is the mother's nutritional status measured by the BMI index. The estimates indicate that children whose

mothers have BMI > 18.5 kg/m<sup>2</sup> have lower log-odds of being underweight (-0.49), stunted (-0.31) and wasted (-0.32).

The third most significant determinant of child malnutrition is the household's access to improved sanitation facility.<sup>2</sup> We find that the magnitude of the coefficient of different malnutrition indicators decreases with improved sanitation facilities. For every one-unit increase in the improved quality of sanitation (flushed), the log odds of being underweight (stunted) declined by -0.32 (-0.30) whereas the log odds of being wasted declined by -0.17.

The other cause of child malnutrition is the duration of breastfeeding and the reference category is children who have never been breastfed. The logit regression estimates show a strong negative association between children who are breastfed for the first six months and malnutrition indicators, i.e., underweight rates (-0.15) and stunting (-0.34). Children who are exclusively breastfed for the first six months have a lower probability of being malnourished. However, if the child is breastfed for more than 13 months, the coefficients of stunting turn positive, showing that there is a higher probability of being stunted. This is because after six months, when the weaning period starts, the child's diet needs to be supplemented with nutritious and solid food.

The estimates also indicate that the consumption of nutritious food (including green leafy vegetables, fruits, milk, and milk products) has a significant impact on reducing the probability of being wasted (-0.10). Across nutritional and healthcare interventions, higher coverage of antenatal care (ANC), measured by the number of ANC visits, has a negative and statistically significant relationship with stunting and underweight rates. The higher the number of ANC visits, the higher the decline in child under-nutrition rates. Women with more than 10

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<sup>1</sup> NFHS 5 has a sample of 205,641 for underweight, 201,276 for stunted and 197,314 for wasted children under five years.

<sup>2</sup> Improved sanitation facility include: Flush to piped sewer system, flush to septic tank, flush to pit latrine, flush to don't know where, ventilated improved pit (VIP)/biogas latrine, pit latrine with slab, twin pit/composting toilet, which is not shared with any other household (NFHS-5)



ANC visits have the lowest chances of giving birth to underweight children (-0.21).

The regression estimates show that IFA supplements taken during pregnancy by the mothers reduce the probability of stunting (-0.04) among children. Another variable which impacts child undernutrition is the place of delivery. We find that delivery at a health care facility (government or private), as compared to delivery at home lowers the log-odds of being underweight (-0.16), stunted (-0.21) and wasted (-0.12). The improved source of drinking water, such as, piped connection within the premises has a significant impact on reducing the probability of being underweight (-0.06).

### Will India be able to achieve nutrition security by 2030?

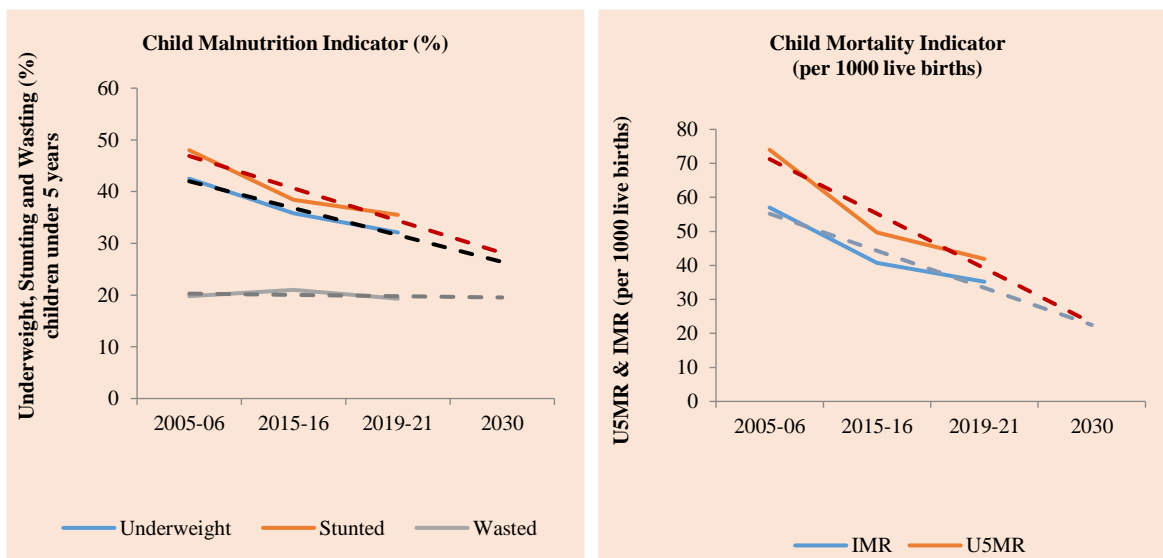
With only 7 years remaining to the SDG Agenda, business-as-usual projection of the current trends till 2030 helps us identify the areas that require a serious intervention. The estimated linear projection of malnutrition indicators for children under five years

of age (underweight, stunting and wasting) are expected to lag far behind the SDG targets of 2030 ( **Figure 3**).

These projections highlight the need for urgent action in order to achieve the SDG targets of reducing stunting and wasting by 2030. Without such measures, these targets are unlikely to be met. Our projections for malnutrition indicators align with the findings of Kharas et al. (2018), who predicted that by 2030, India will account for 33 percent of the world's stunted children and 21 percent of the world's wasted children.

When considering the linear projection of infant mortality rate and under-five mortality rates (per 1000 live births), it is encouraging to see that a substantial decline can be expected by 2030. Under current trends (business as usual), India appears to be on track to achieve the goal of reducing under-five mortality rates (U5MR) by 25 per 1,000 live births by 2030.

**Figure 3: Projection of SDG targets based on current trends**



Source: Author's calculation based on NFHS-3,4 & 5

## **What can the global south, especially Africa, learn from these results of India's largest data base and analysis?**

Addressing the challenges of malnutrition in India and Africa necessitates the adoption of a comprehensive approach that integrates multipronged short-term and long-term strategies, if SDG's have to be achieved by 2030.

First, our analysis for India highlights that mothers' education, particularly higher education, and her nutrition status are strongly associated with the nutrition parameters of children. Investing in women's higher education can contribute substantially to increase the female labour force participation in the long-term, thereby fostering higher economic growth. Hence, the state governments in India need to promote higher education among women through better targeted scholarship programme. Introducing a scholarship of say Rs. 500 per month from the 9<sup>th</sup> standard and gradually increase to Rs. 1000 until graduation, and then further increasing it to Rs 2000 per month for post-graduation can significantly reduce the dropout rates among female students in secondary and higher education.

Second, the implementation of WASH (Water, Sanitation, and Hygiene) initiative has a substantial impact on nutritional outcomes. The Swachh Bharat Abhiyan, aimed at eliminating open defecation and eradicating manual scavenging, has witnessed remarkable progress. The number of households with access to improved sanitation facility increased from 48.5 to 70 percent between 2015-16 and 2019-21. Similarly, under the central government's Jal Jeevan Mission (Har Ghar Jal), the coverage of household with drinking water tap connection has significantly expanded to 65.5 percent of the total rural households as of August 4<sup>th</sup>, 2023 (PIB, 2023). However, during NFHS-3 to NFHS-5, the household reporting tapped connection increased meagrely from 24.5 to 32.9 percent, emphasising still ample work is left. The success of WASH initiatives depends on spreading awareness through comprehensive awareness programmes, empowering Anganwadi workers and community participation to bring about significant behavioural change.

Third, the piecemeal approach of the government's food safety nets including the mid-day meal scheme, the Anganwadi system under the Integrated Child Development Scheme (ICDS), and subsidised food grains through the public distribution system (PDS), seems to have failed in improving the nutritional status of the population. About 800 million Indians still rely on the PDS. In the Union Budget for 2023-24, an allocation of Rs. 1.97 lakh crore was for food subsidy under the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY). The food safety nets, biased in favour of staples, need to shift towards providing a nutritious diet. In this regard, the in-built provision under the National Food Security Act (2013) could be utilized to provide households a choice-based system to opt between subsidized food grain or conditional cash transfers. Alternatively, a centralized system could be devised to issue vouchers, which would be inflation-indexed cash entitlements. These vouchers would be distributed through the existing network of PDS outlets, granting beneficiaries autonomy to make choices as per their diet preferences and requirements.

Fourth, scaling up bio-fortification in staple crops, an innovative and cost-effective technique, can ensure availability of nutritious diets in areas affected by chronic malnutrition in India and Africa. Initiatives like the Harvest-Plus program by the Consultative Group on International Agricultural Research (CGIAR) have made significant strides in developing new varieties of nutrient-rich staple foods in many African countries and India. Such innovations can be implemented on a large-scale in Indian states and African countries to reduce malnutrition on war footing.

Fifth, the introduction of complementary feeding and a diverse diet has not improved significantly over the last two decades. Saksham Anganwadi and Mission POSHAN 2.0 requires large-scale comprehensive awareness programme and infant and young child feeding guidelines to improve breastfeeding practices and the introduction of nutritious diets during the weaning period. Anganwadi workers and community participation can contribute in ensuring significant improvements in child-care practices and antenatal care for mothers and children through good governance.

These findings need to be shared widely with African nations for cross learning in global south collaboration. The mutual exchange of best practices can help in designing action-oriented and targeted strategies aimed at eradicating hunger and malnutrition in both India and Africa by 2030.

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## Annexure

Table 2: Logit estimates for children below 5 years of age using unit level data of NFHS 2019-21, 2015-16 and 2005-06

Variables	NFHS-5			NFHS 4			NFHS 3			Remarks
	Underweight	Stunting	Wasting	Underweight	Stunting	Wasting	Underweight	Stunting	Wasting	
<b>Mothers' Education status (Ref: No Education)</b>										
Primary	-0.09***	-0.11***	-0.15***	-0.16***	-0.15***	-0.03*	-0.14***	-0.11***	-0.03	Most impactful variable for all three rounds
Secondary	-0.32***	-0.36***	-0.16***	-0.31***	-0.37***	0.01	-0.26***	-0.28***	-0.10***	
Higher	-0.63***	-0.77***	-0.27***	-0.64***	-0.67***	-0.04*	-0.64***	-0.68***	-0.07	
<b>Mother's BMI (Reference: BMI lower than 18.5)</b>										
BMI >18.5	-0.49***	-0.31***	-0.32***	-0.51***	-0.22***	-0.39***	-0.45***	-0.17***	-0.44***	
<b>Sanitation (Ref: No toilet)</b>										Subsumed in wealth index in NFHS 4&3
Improved toilets	-0.32**	-0.30***	-0.17***							
Not improved source (pit latrine)	-0.19**	-0.19***	-0.07***							
<b>Wealth Index (Ref: poorest) #</b>				-0.18***	-0.10***	-0.10***	-0.19***	-0.13***	-0.12***	Proxy for household assets including sanitation & drinking water
Poorer				-0.36***	-0.23***	-0.18***	-0.40***	-0.21***	-0.24***	
Middle				-0.50***	-0.39***	-0.19***	-0.53***	-0.33***	-0.32***	
Richer				-0.73***	-0.59***	-0.25***	-0.92***	-0.70***	-0.47***	
Richest				-0.18***	-0.10***	-0.10***				
<b>Duration of breastfeeding (Ref: Never breastfed)</b>										
0-6 months	-0.15***	-0.34***	0.01	-0.28***	-0.54***	-0.28***	-0.40***	-1.09***		
7-12 months	-0.18***	-0.22***	-0.12**	-0.15***	-0.35***	-0.15***	-0.07	-0.49***		
13 and above months	0.06	0.17***	-0.25***	0.14***	0.24***	0.14***	0.29***	0.24**		
<b>Consumption of nutritious food * by child (Ref: did not consume)</b>										
Consumed	-0.02		-0.10***	-0.16***						

<b>Antenatal visits (Ref: No visits)</b>										
1-4 visits	-0.08***		-0.18***	-0.04***	-0.10***		-0.28***	-0.15***	-0.13***	
5-10	-0.13***		-0.19***	-0.13***	-0.27***		-0.44***	-0.36***	-0.25***	
10 above	-0.21***		-0.38***	-0.24***	-0.25***		-0.73***	-0.58***	-0.40***	
<b>Taken Iron Folic Supplements during pregnancy (Ref: not taken)</b>										
Taken supplements	0.00	-0.04*	-0.01	-0.03***	-0.09***					
<b>Place of delivery (Ref: at home)</b>										
Institution (Private or Govt health care facility)	-0.16***	-0.21***	-0.12***	-0.07***	-0.04***		-0.11***	-0.11***		
<b>Water facility (Ref: Source outside HHD)</b>										Subsumed in wealth index in NFHS 4&3
Improved source: Piped inside Household	-0.06***	-0.007	-0.01							
<b>Caste (Ref: Scheduled population)</b>										
OBC or Others				-0.13***	-0.09***	-0.11***	-0.38***	-0.20***	-0.34***	
<b>Basic Vaccinations ** (Ref: Not received)</b>										
Received									-0.24***	
<b>Constant</b>	0.34***	0.37***	-0.30	0.58***	0.45***	-0.82***	0.62***	0.65***	-0.59***	
<b>Number of observations</b>	80,183	158,106	76,515	160493	160493	216027	30249	30249	27461	
<b>Pseudo R square</b>	0.02	0.03	0.01	0.06	0.06	0.01	0.09	0.09	0.03	

Source: Author's calculation based on WHO standards.

Note: \*Nutritious food includes green leafy vegetable, fruits, milk and milk products, \*\*Basic vaccination includes BCG, measles, and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth). # Wealth Index construction subsumes sanitation and drinking water facility, hence not taken in NFHS-5 regression analysis due to collinearity. NFHS gives information on wealth index which is based on assets and housing characteristics.







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