

What Causes Poor Child Health in India?

Reflections from NFHS-5

Neeraj Kumar
Arup Mitra

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Neeraj Kumar¹ and Arup Mitra²

Abstract

This paper based on the data from the NFHS-5 examines various indicators of child health in India. A variety of correlates have been considered in order to understand the causes of poor health outcomes and reflect on effective strategies which may contribute to better health of the children. The inter-spatial variations bring out certain specific patterns based on which insights are developed. A major deterioration in the food value seems to have occurred, causing stunting, wasting, underweight and anemia among the children. Mothers' diet, access to medicines, antenatal care and education and participation in the decision-making process within the household are some of the important factors to bring in improvement in child health. Besides, the role of sanitation, vaccine and breast feeding comes out clearly in restoring the health of the children.

Keywords: health, food, nutrition, NFHS

¹ Neeraj Kumar, a member of the Indian Economic Service, is deputy director with the Ministry of Finance, Government of India and presently a Ph D scholar at the Delhi School of Economics; neeraj@econdse.org

² Arup Mitra is professor of Economics with the Institute of Economic Growth, Delhi; arup@iegindia.org

Views expressed are personal.

Introduction

Nearly half of all deaths in children under 5 across the globe are attributable to undernutrition. Undernutrition puts children at greater risk of dying from common infections, increases the frequency and severity of such infections and delays recovery (UNICEF 2020). Stunting is declining too slowly while wasting impacts the lives of far too many young children on the planet. Child health is a pertinent issue because it determines the health outcomes in later life and their implications in terms of productivity performance of the economy. Even the investment in the key sectors is dependent on the social infrastructure endowment of the region (Mitra, Varoudakis and Veganzones-Varoudakis 2002). After all, future economic growth depends on a variety of development indicators though we believe that rapid economic growth may release resources to be utilized in the broad areas of development. Inadequate nutrition, poor health and the lack of accessibility to certain facilities at the time of birth have serious bearings in terms of sluggish economic growth in the long run (Kumar and Mitra 2009).

The findings of the latest round of National Family Health Survey (NFHS-5) conducted in 2019-20 covering 22 States/UTs under Phase-I (PIB 2020) present a somewhat disappointing picture of children's health in many parts of India (MOHFW 2020). Majority of the experts, based on prima facie evidence, just highlighted the deteriorating sign of child health in terms of increase in proportion of stunted and underweight children in most of the phase-I states/UTs over last two rounds of NFHS (2015-16 to 2019-20). Several authors concluded that the poorer child health outcomes during last five years are either due to economic slowdown, deteriorating public health care systems, or due to adverse effects of poverty, unemployment and the economic shocks India experienced (Drèze, et al. 2020, Kurian 2020, Rukmini 2020). However, a careful examination of NFHS-5 data shows considerable improvement in close to 100 of the 131 indicators associated directly or indirectly with child health and social welfare (Bhalla 2020).

This study presents a comprehensive inter-temporal analysis across a bunch of variables related with child health, identify the cause associated with 'deteriorating' cumulative child health indicators and suggest a few key strategic interventions to control incidence of malnutrition in India.

Broad Patterns

Along with an increase in the proportion of stunted (low height for age), wasted (low weight for height) and underweight (weight for age) children in most of the phase-I states over past five years, we see a larger increase in proportion of overweight children in almost all the states during the same period.

We also find evidence of falling mortality rates, enormous improvements in sanitation and hygiene facilities, improved breastfeeding and dietary pattern among infants and toddlers, higher immunization coverage, better utilization of maternal care facilities and increased government's support in terms of higher utilization of insurance and financing scheme.

All this evidence, contrary to the widely spread narrative around ‘deteriorating’ children’s health, neither suggest reversal/stagnation in gains in child mortality trends, nor made us conclude that poorer child health outcomes are caused by ill effects of economic slowdown, poverty, unemployment, economic shocks or due to deteriorating public healthcare system.

The four key indicators, measuring cumulative status of child nutrition - stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and overweight, in children below 5 years of age - show a mixed pattern. Deterioration in these indicators suggests acute or chronic child under-nutrition. Child stunting worsened in 13 of the 22 phase-I states/UTs. Maximum increase of 8 percentage points in the level of child stunting is witnessed in Tripura from 24.3% in 2015 to 32.3% in 2019. Likewise, Goa saw an increase in child stunting level by 5.7 percentage points to 25.8% in 2019 from 20.1% in 2015.

Gujarat and Maharashtra witnessed marginal increase in the level of stunting by 0.5 percentage points and 0.8 percentage points respectively. Kerala, which had the lowest level of child stunting (19.7%) in 2015, witnessed an increase of 3.7 percentage points and is now replaced by Sikkim in this ranking. Sikkim shows improvement in the level of child stunting to the tune of 7.3 percentage points from 29.6 in 2015 to 22.3% (lowest) in 2019.

Sixteen of the 22 states saw an increase in the proportion of underweight children below age 5 in 2019 as compared to 2015. These include Nagaland where 26.9% children were underweight in 2019 as compared to 16.7% in 2015. Himachal Pradesh, Kerala and Telangana showed increase of 4.3 percentage points, 3.6 percentage points and 3.4 percentage points respectively. Bihar causes surprises with improvement in this indicator from 43.9% to 41% over the same period.

Child wasting became worse in 12 of the 22 states/UTs. Maximum increase in the level of child wasting is witnessed in Ladakh from 9.3% in 2015 to 17.5% in 2019 followed by Nagaland and Jammu and Kashmir (J&K) by 7.8 percentage points and 6.8 percentage points respectively. Karnataka shows maximum improvement where child wasting rate came down from 26.1% to 19.5%.

Another cumulative child health indicator -- the proportion of overweight children under 5 -- is hardly discussed in any of the recent articles highlighting deteriorating child health, despite the fact that this indicator worsened in almost all phase-I states/UTs. Only two UTs show marginal improvement.

Exploring the root cause of deterioration in this indicator may unveil a different story. A story not based on the arguments floating around that increase in prevalence of stunted and underweight children in many states is due to economic slowdown, low employment and incomes, or due to poor health care facilities. Let us have a look at the following indicators:

Neonatal, Infant and Under-Five Mortality Rates (NMR, IMR and U5MR) across most Indian states declined in the past 5 years. To be precise, 15 states/UTs of the 22 states saw steep reduction in all

these three child mortality indicators. Sikkim, Jammu & Kashmir, Assam and Ladakh witnessed a steep reduction in all NMR, IMR and U5MR with magnitude of reduction in the range of 10.3 to 21 percentage points. IMR and U5MR declined in 18 of the 22 states/UTs. Sikkim and Mizoram saw decline in IMR by 18.3 and 18.8 percentage points respectively, while U5MR declined by 21 and 22 percentage points respectively in these two states. The four states/UTs of Tripura, A&N, Manipur and Meghalaya recording an increase in all the three child mortality indicators are the worst performing states in terms of these child mortality indicators. Overall the picture is, however, improving; certainly it doesn't look as bad as portrayed. No evidence of reversal/stagnation in gains in child mortality trends is seen.

Full immunization drive among children have substantially improved across the states/UTs. We look at 10 key vaccination indicators across the 22 states/UTs covering children age between 12-23 months who are fully vaccinated and protected against key childhood diseases based on different information criteria. Over the past half a decade, there has been expeditious increase in full immunization coverage in many states/UT. Of these 220 instances (10*22), immunization coverage improved in 155 cases. The improvement was to the tune of over 10 percentage points in 11 of the 22 states/UTs and in another 4 states/UTs between 5 to 9 percentage points during the said period. More than two-third of children are fully immunized in all the States and UTs except Nagaland, Meghalaya and Assam.

In almost three-fourths of districts, 70% or more children aged 12-23 months are fully immunized against childhood diseases. The percentage increase in children 12-23 months receiving 3 doses of penta or hepatitis B vaccine, from about 64% in 2015 to 84% in 2019 across all 22 states/UTs, is a good story to tell. Sikkim, Kerala and Goa show declines in immunization coverage but these states already had high levels of coverage.

We examine 5 key indicators viz. percentage of children under age 6 months exclusively breastfed, children age 6-8 months receiving solid or semi-solid food and breastmilk, breastfed and non-breastfed children age 6-23 months receiving an adequate diet and total children age 6-23 months receiving an adequate diet across the 22 states/UTs. In 73 of these 110 (5*22) cases, improvements in breast-feeding and dietary pattern of the children are witnessed. For examples, the proportion of children aged 6-23 months receiving an adequate diet improved in 17 of the 22 states/UTs surveyed. This along with an increase in overweight children indicates that it is not the quantity but quality of diet which needs further examination. That is, more than income levels of households, how they spend their incomes, what they offer their children and the quality and nutrition value of offered / available food items need to be seen.

We also track the following 6 key indicators over the two NFHS rounds across the 22 states/UTs: proportion of mothers who had an antenatal check-up in the first trimester, who had at least 4 antenatal care visits, whose last birth was protected against neonatal tetanus, who consumed iron

folic acid for 100 days or more and for 180 days or more when they were pregnant, and who received postnatal care from a professional health personnel within 2 days of delivery.

Of these 132 instances, the proportion of these maternal care indicators improved in 97 cases. For example, proportion of mothers who had an antenatal check-up in the first trimester increased consistently in 17 of the 22 states/UTs surveyed (others witnessed marginal decline). Similarly, the proportion of mothers who received professional postnatal care increased in 18 of the 22 states/UTs. These improvements do not suggest deteriorating maternal health care facilities.

Enormous improvements in sanitation and hygiene facilities, and access to electricity and clean fuel for cooking, are witnessed in all the states. Only in Sikkim, marginally fewer households have access to electricity, improved sanitation facilities and improved drinking water source. That is, standard of living and basic infrastructure support are improving at quite a fast pace at pan India level. Other indicators such as the number of households covered under a health insurance/financing scheme increased, on an average, from 26% in 2015 to 37.2% in 2019 in all the states/UTs surveyed. Still low but significantly improving in 16 of the 22 states/UTs. Average education level is also improving across the states.

All these factors put together, which directly or indirectly determine general wellbeing of an average household and thereby dietary pattern of children, show signs of improvement across the states/UTs. Now, looking at the status of cumulative child health indicators, the questions arise: what exactly constitute diet of children under five? What is the micronutrient content of their diet? What is the structure of consumption pattern of an average household? And how these indicators performed during past half a decade.

Results from Factor Analysis

Factor analysis is conducted on the following 15 indicators connected with child health across the 22 states/UTs surveyed under phase-I of NFHS-5. Definitions of the variables employed and results of factor analysis in respect of NFHS-5 total, rural and urban as well as for NFHS-4 are presented below.

S. No.	Variables	Definition
1	stunting	Children under 5 years who are stunted (height-for-age)(%)
2	wasting	Children under 5 years who are wasted (weight-for-height)(%)
3	underweight	Children under 5 years who are underweight (weight-for-age)(%)
4	overweight	Children under 5 years who are overweight (weight-for-height)(%)
5	anaemia_U5	Children age 6-59 months who are anaemic (<11.0 g/dl)(%)
6	U5MR	Under-five mortality rate (U5MR)
7	ANC	Mothers who had at least 4 antenatal care visits (%)

8	iron_pmother	Mothers who consumed iron folic acid for 180 days or more when they were pregnant (%)
9	vaccine	Children age 12-23 months fully vaccinated based on information from either vaccination card or mother's recall(%)
10	ebf6	Children under age 6 months exclusively breastfed(%)
11	diet68m	Children age 6-8 months receiving solid or semi-solid food and breastmilk(%)
12	diet2y	Total children age 6-23 months receiving an adequate diet(%)
13	sanitation	Population living in households that use an improved sanitation facility(%)
14	mother_decision	Currently married women who usually participate in three household decisions(%)
15	mother_educ	Women with 10 or more years of schooling (%)

In order to undertake a detailed study of the data we take recourse to factor analysis:

$$F_j = \sum \beta_i X_i$$

where, F_j is the j th factor and β_i is the factor loading of the variable X_i corresponding to the j th factor, F_j ; j represents the number of significant factors while i represents the number of variables.

From NFHS 5 data around four factors are found to be statistically significant (Table 1). It is indicated that in the first factor wasting, underweight and anaemia in children under 5 are strongly interconnected and with them diet68m and diet2y (adequate breastfeeding till 8 months and intake solid/semi-solid meals from 6 months to 2 years) are related with a negative sign suggesting that adequate diet of infants and toddlers can reduce the cumulative incidence of poor health among the children under 5. Sanitation, decision making power of women and women's education also reduce these phenomena, moderately though.

Again from factor 2, stunting, underweight and under 5 mortality seem to be correlated and diet of 6-8 months old infant, sanitation and women education tend to control these variables. Antenatal care (ANC) and the ability to breast feed again bear a positive association (factor 3). This indicates that adequate antenatal care to a pregnant women improves supply of adequate nourishment to a new born child. Only exclusive breast feeding till 6 months can ensure adequate nutrition in infants, build their immunity and protect them from infectious diseases. With adequate diet of children till 2 years as seen from factor 3 and with proper ANC, complete vaccination and adequate consumption of iron folic acid during pregnancy, as seen from factor 4, the under 5 mortality declines. That overweight and under 5 mortality can decline with improvement in the level of education of the mother is borne out from factor 5.

Table 1: NFHS-5 (2019-20): Rotated factor loadings

Variable	Factor1	Factor2	Factor3	Factor4
Stunting	0.28	0.88	-0.01	-0.06
Wasting	0.95	0.17	0.09	0.06
underweight	0.71	0.50	0.13	0.05
overweight	-0.18	-0.30	-0.15	0.06
anaemia_u5	0.68	0.16	0.22	0.32
u5mr	0.16	0.57	0.24	-0.26
Anc	-0.06	-0.18	0.34	0.54
iron_pmother	0.03	-0.14	0.02	0.24
Vaccine	0.14	-0.07	0.10	0.92
ebf6	0.13	0.08	0.94	0.19
diet68m	-0.50	-0.23	-0.21	-0.12
diet2y	-0.60	0.04	-0.64	0.15
Sanitation	-0.29	-0.18	-0.20	-0.07
mother_decision	-0.21	-0.01	0.01	-0.19
mother_educ	-0.20	-0.32	0.01	0.15

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	6.08	2.77	0.41	0.41
Factor2	3.31	1.63	0.22	0.63
Factor3	1.67	0.50	0.11	0.74
Factor4	1.17	0.26	0.08	0.82

Pertaining to the rural areas (Table 2), wasting, underweight and anaemia are correlated and adequate diet till 2 years, sanitation and decision making power of women seem to control these cumulative health indicator (factor 1). The strong association among stunting, underweight and under 5 mortality is also evident from factor 2 which suggests the effectiveness of women's education in determining a child's cumulative health. Proper antenatal care, complete vaccination and women's education can reduce under 5 mortality (factor 3). Children who were exclusively breastfed till 6 months seem to have less possibility of being overweight (factor 4) indicating dependence on formula milk cannot provide sufficient nutrition and may deteriorate long term child health.

Table 2: NFHS-5_Rural (2019-20): Rotated factor loadings

Variable	Factor1	Factor2	Factor3	Factor4
Stunting	0.23	0.91	-0.19	0.09
Wasting	0.95	0.18	0.02	-0.17
underweight	0.71	0.60	-0.01	-0.17
overweight	-0.16	-0.68	-0.17	0.46
anaemia_u5	0.67	0.06	0.05	-0.16
u5mr	0.11	0.53	-0.41	-0.17
Anc	0.00	-0.25	0.74	-0.18
iron_pmother	0.03	0.00	0.94	-0.02
Vaccine	0.13	-0.19	0.37	0.04
ebf6	0.12	-0.01	0.19	-0.90
diet68m	-0.30	-0.08	0.18	0.15
diet2y	-0.39	-0.13	0.19	0.74
Sanitation	-0.39	-0.25	0.13	0.25
mother_decision	-0.26	-0.11	-0.09	0.11
mother_educ	-0.16	-0.28	0.44	-0.04

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.97	2.42	0.40	0.40
Factor2	3.55	1.79	0.24	0.64
Factor3	1.76	0.57	0.12	0.76
Factor4	1.19	0.38	0.08	0.84

The relationship among stunting, wasting, underweight and anaemia in children under 5 is much stronger in the case of the urban areas (Table 3) compared to the rural areas and the role of women's participation in the decision making process and their educational status is effective in controlling the health adversity of the children (factor 1). Under 5 mortality can be reduced through complete vaccination protection, proper antenatal care, adequate iron folic acid consumption of the mother during pregnancy and adequate diet of a child till 2 years (factor 2). Mother's ability to breast feed and their accessibility to antenatal care go hand in hand as EBF6 and ANC are related and the problem of overweight can be dealt effectively with adequate diet till 2 years of age (factor 3). In urban India, the role of women's education is effective in reducing the problem of under 5 mortality and other health adversity of the children. Proper antenatal care and adequate iron folic consumption during pregnancy also reduce prevalence of stunting (factor 5).

Table 3: NFHS-5_Urban(2019-20): Rotated factor loadings

Variable	Factor1	Factor2	Factor3	Factor4	Factor5
Stunting	0.87	0.00	0.03	0.23	-0.31
Wasting	0.88	-0.08	-0.37	0.09	0.08
Underweight	0.87	-0.11	-0.24	0.26	0.12
Overweight	-0.10	0.11	0.37	-0.07	-0.33
anaemia_u5	0.81	0.14	0.22	0.40	0.02
u5mr	0.41	-0.55	0.05	0.57	-0.23
Anc	-0.23	0.72	0.42	-0.07	0.45
iron_pmother	-0.08	0.29	0.00	-0.11	0.89
Vaccine	0.05	0.97	-0.11	-0.11	0.08
ebf6	-0.01	0.00	0.96	0.13	0.03
diet68m	-0.80	0.12	-0.31	0.00	0.21
diet2y	-0.68	0.36	-0.45	0.04	0.13
Sanitation	-0.07	0.09	0.01	-0.22	0.14
mother_decision	-0.26	-0.04	-0.03	-0.02	-0.04
mother_educ	-0.31	0.14	-0.11	-0.90	0.07

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.95	3.56	0.40	0.40
Factor2	2.38	0.06	0.16	0.56
Factor3	2.33	0.93	0.16	0.71
Factor4	1.40	0.30	0.09	0.80
Factor5	1.10	0.29	0.07	0.88

Similar findings are verifiable from NFHS 4 dataset (Table 4). Prevalence of wasting, underweight, stunting and anaemia in children under 5 are correlated and they respond negatively to provision of adequate diet till 2 years and also to women's participation in the decision making process and their education level (factor 1). Factor 2: Prevalence of stunting and under 5 mortality are associated and the role of iron folic acid consumption during pregnancy and mother's education in this context is strongly evident (factor 2). Sanitation, as seen from both factor 3 and factor 2, tends to reduce the adversity of the child's cumulative health particularly in terms of anaemia, under 5 mortality and stunting. The effectiveness of exclusive breast feeding is seen only in the least important factor (4). On the whole, while the similarities in the findings both from NFHS4 and NFHS 5 are noticeable the differences particularly in terms of the controlling factors have undergone changes. The findings

from the NFHS5 in this regard are much more elaborate and bring out the importance of a variety of factors with differences in the rural and urban configurations.

Table 4: NFHS-4 (2015-16): Rotated factor loadings

Variable	Factor1	Factor2	Factor3	Factor4
Stunting	0.45	-0.42	0.48	0.41
Wasting	0.96	0.13	0.12	0.11
Underweight	0.82	-0.19	0.34	0.16
Overweight	-0.30	0.02	-0.13	0.10
anaemia_u5	0.42	0.10	0.70	-0.06
u5mr	0.07	-0.68	0.36	0.03
Anc	0.05	0.55	0.01	-0.41
iron_pmother	0.29	0.89	-0.07	-0.09
Vaccine	-0.17	0.34	0.14	-0.03
ebf6	-0.07	0.09	0.11	-0.96
diet68m	-0.54	0.18	-0.29	0.28
diet2y	-0.69	0.06	-0.01	0.38
Sanitation	-0.12	0.36	-0.85	0.13
mother_decision	-0.54	0.03	-0.57	0.10
mother_educ	-0.26	0.91	-0.12	-0.03

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	5.64	2.35	0.40	0.40
Factor2	3.29	1.62	0.23	0.63
Factor3	1.67	0.17	0.12	0.75
Factor4	1.51	0.63	0.11	0.86

Discussion

There is a possibility that the consumption of nutritious food is on the decline. Both the demonstration effects and compulsions to spend for non-food items may have raised the consumption of junk food or prompted households to make compromises on the consumption of nutritious food items.

The fact that the low income households may have to spend on education and curative health care of the children forces many to downgrade the quality of food while the quantity might have been maintained. Hence, it is time to probe into these directions and identify the areas of possible interventions so that the out of pocket expenditure that the households incur does not involve significant trade-offs in relation to the quality of food children consume.

To improve food security and nutrition, India has already implemented the Public Distribution System, the Integrated Child Development Services and the Mid-day Meals programme, which are amongst world's three largest programs. India's economy has also grown substantially and steadily since 1991. And, yet half of India's children under 5 were stunted in 2005-06 (NFHS-3).

This number was 38.4% in 2015-16 (NFHS-4) and now the average stunting level stands at approximately 32% in the 22 states/UTs surveyed in 2019-20 (NFHS-5), which is still high. India cannot afford to have these many children consuming less nutritious and low quality food. If the demographic dividend has to be reaped and the productivity of the future labour force has to be enhanced today's children who are tomorrow's youth must be able to access supplies of quality food.

Even overweight/obesity among men and women has gone up in most of the states. The recent CNNS Report (GoI 2019) also mentions that India has undergone a nutrition transition from an underweight to an overweight population during recent decades, with a rise in the prevalence of overweight and obesity with an estimated 166 million adults overweight or obese in 2016, and 73 million adults affected by diabetes, the second largest number worldwide. Prevalence of the dual burdens of undernutrition and overnutrition is apparent with increase in number of individuals who are concurrently overweight, stunted and/or micronutrient deficient. India's adoption of the global phenomenon of shifts in diet and lifestyle patterns at such a pace have led to increased risks for non-communicable diseases (NCDs) across all socio-economic strata contributing a larger proportion to premature mortality. Thanks to the cheap and readily available foods and drinks high in fat, sugar and salt, leading to a rapid rise in the number of children and adults who are overweight and at risk for diet-related NCDs such as heart disease and diabetes.

The serious challenge of undernourishment in India is also highlighted by Joshi (2016). Though, calorie consumption remains around 2100 kcal/day, India consumes more of fat and less of protein. The paper estimates that the per-capita protein consumption has declined marginally from about 60 grams/day in 1983 to 57 grams/day in 2011-12, while fat intake has increased substantially from 30 to 50 grams/day/cap. The study argues that India's high economic growth has not been inclusive and nutrition sensitive. The dietary pattern is diversifying and changing due to rising incomes, expanding urbanization, unfolding globalization, and changing taste and preferences for food.

The State of the World's Children 2019 report (UNICEF 2019) estimates that every second child below the age of five in India is affected by some form of malnutrition. The report states that almost two in three children between six months and two years of age are not given food that supports their rapidly growing bodies and brains. This puts them at risk of poor brain development, weak learning, low immunity, increased infections and, in many cases, death.

Stunting in early life have long-term effects on health, physical and cognitive development, productivity and earning potential. Therefore, it holds an enormous relevance from individual to national to global level. A global review on child stunting and economic outcomes revealed a 1 cm increase in height was associated with a 4% increase in wages for men and a 6% increase in wages

for women (McGovern, et al. 2017). Therefore, investing in the reduction of child malnutrition is paramount for human and economic development.

A few suggestions to help reduce malnutrition level in India are presented below. Empowering communities and help strengthening civil society to promote healthy diets, and form strategic alliances with stakeholders are part of crucial policy directions to reduce the double burden of malnutrition in the South-East Asia Region (WHO report on Strategic Action Plan 2016). In addition, strengthening grassroots health institutions to address with adequate resources, capacity strengthening and comprehensive monitoring and evaluation may help control the double burden of malnutrition in the region.

Key Initiatives

Brazil's school feeding program is also one of the largest in the world and provides free meals in all public schools like India's Mid-day meal scheme. This programme encourages purchase and use of locally produced fruits and vegetables from local smallholders as much as possible. This enhances not only the nutrition content in children's diet but also small farmers' incomes and school enrolments. Brazil mandates fortification of all of its wheat and corn flour with iron and folic acid by law since April 2004 to meet its anemia control targets.

Micronutrient malnutrition in children especially of developing countries like India should be tackled through improving dietary diversity, and supplementation or mandatory food fortification. A few examples have shown evidence of the feasibility and effectiveness of biofortified vitamin A-rich crops such as orange sweet potato for increasing maternal and child vitamin A intake. Nutrition-sensitive interventions in agriculture, social safety nets, early child development, and education may be prioritized (Ruel and Alderman 2013). A combination of all such high-priority targeted efforts may help reduce incidence of malnutrition.

An initiative started in a remote border district of Mizoram developed edible terrace gardens in schools and anganwadi centres. Children are encouraged to consume more fruits and vegetables during their mid-day meals. This not only improved self-sufficiency in fruits and vegetables at low cost, but also improved nutrition value of children diet. UNICEF's community-led Nutrition Gardens in Chhattisgarh also sets a good example in promoting nutrition levels and reduction in incidence of diseases associated with malnutrition. Farmers in rural Odisha have utilized their backyard spaces to grow seasonal fruits and vegetables. This has also increased participation by women and an improvement in their economic conditions with the sale of produce. A study from rural Maharashtra suggests that nutri-gardens and community gardens have tremendous potential to decrease malnutrition in children.

Bhutta, et al. (2013) also argue in favor of community engagement and delivery strategies that can reach poor segments of the population and state that nutrition-specific interventions to avert maternal and child undernutrition and micronutrient deficiencies can make a great difference. If improved

access through women's empowerment, agriculture, food systems, education, employment, social protection, and safety nets, is linked to nutrition-sensitive approaches, they can greatly accelerate progress in countries like India with the high burden of maternal and child undernutrition and mortality.

Above all, parental awareness and schooling must be on top priority to improve nutrition outcomes. Parental schooling is consistently associated with improved nutrition outcomes. Less than half of mothers of children and adolescents were exposed to any mass media in 5/9 Empowered Action Group (EAG) states (Assam, Bihar, Jharkhand, Rajasthan, Uttar Pradesh) and Meghalaya (GoI-UNICEF Report 2019). All schools must include nutrition sensitive and growth monitoring curricula for prevention and treatment of undernutrition or obesity. Anganwadi centres and other grassroots social activists must be tapped to include nutrition related information in their discussions with parents. Counselling on breastfeeding and complementary feeding, meaning of complete diet, vitamin A campaigns, relevance of iron in pregnancy, sanitation and hygiene, deworming for kindergartens, and most importantly, growth monitoring through widespread awareness are essential to reduce malnourishment in children.

The main interventions of China's Health Literacy policy 2008 include public advertisement on the essential knowledge and skills through all kinds of media, health education and promotion activities in various settings including communities, health facilities and workplaces, and population-based surveillance. Their National Health and Family Planning Commission works closely with Ministry of Education to add health literacy as a key curriculum area for primary, secondary and tertiary schools. Initial success led the Government of China issue the new Strategic Plan on Health Literacy Promotion for Chinese Citizens in 2014 (WHO n.d.).

Civil society's proactive participation, fortification of essential food items with legal provisions, popularizing community/kitchen organic-gardens, awareness about low cost nutritious food, growth monitoring of children, ill-effects of fast/packaged food, through widespread media campaigns with special focus on vulnerable groups may help curb micro-nutrient deficiencies and improve child health in India. Particularly among the low income households the meaning and implications of junk food and less nutritious diet will have to be explained intensely.

The misconceptions about food, particularly being led by the commercial advertisements, will have to be cleared. Else, a rise in consumption expenditure per capita will not ensure good health and improvement in productivity. It is important to realise that India is at the crossroads, moving away from the diet which comprised what is known as a poor man's protein to consumption of less nutritious fancy food.

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University Enclave, University of Delhi
(North Campus) Delhi 110007, India

Tel: 27667288/365/424

Email: system@iegindia.org