

# Micronutrient Deficiencies in India

Past, Present and Way Forward to meet the SDG Targets

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# Micronutrients

*Their deficiency has the more eloquent term: "Hidden Hunger"*

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<b>Iron</b>	<b>Vitamin A</b>	<b>Vitamin D</b>	<b>Cobalt</b>
	<b>Iodine</b>	<b>Thiamin</b>	<b>Riboflavin</b>
<b>Vitamin B<sub>6</sub></b>		<b>Vitamin E</b>	<b>Magnesium</b>
<b>Manganese</b>		<b>Zinc</b>	<b>Selenium</b>
<b>Folate</b>		<b>Vitamin B<sub>12</sub></b>	<b>Niacin</b>
		<b>Phosphorus</b>	<b>Vitamin K</b>
<b>Vitamin C</b>		<b>Cobalamin</b>	<b>Chromium</b>

# The Burden of Hidden Hunger in India

**About 26%** Of India's population - 268 million – are considered food-insecure, consuming less than 80% of minimum energy requirements.

**58.5%** children anemic <sup>3</sup>

**57%** of the preschool children have subclinical Vitamin A deficiency.<sup>4</sup>

**200,000** babies are born every year with Neural Tube defects (NTDs) due to folic acid deficiency.<sup>5</sup>

India ranks **103 out of 119 countries** on basis of three indicators -- prevalence of wasting & stunting in children < 5 years, under 5 child mortality rate, and proportion of undernourished in the population.<sup>1</sup>

**2.4% of GDP:** Economic Losses as a result of Hidden Hunger

**62%** of the population is at risk of Vitamin A Deficiency <sup>2</sup>

Iodine deficiency is endemic in all parts of the country.

Incidence of NTDs in the Indian varies between **0.5-8/1000 births.**<sup>6</sup>

1 The Global Hunger Index, 2018

2 FAO, 2013

3 NFHS-4 (National Family and Health Survey 2015-16) Fact Sheet

4 India's undernourished children: A call for reform and action, The World Bank 2006

5 VP Kotech, Micronutrient Malnutrition in India: Let Us Say "No" to it Now, Indian J Community Med. 2008

6 India's undernourished children: A call for reform and action, The World Bank, 2006

# Progress has been made in addressing Hidden Hunger

Earlier success with Beri Beri, Pellagra, Scurvy

Universal Salt Iodization: 93.1% households consume iodized salt (NFHS 4). Incidence of Cretinism is negligible.

Incidence of Keratomalacia has drastically come down. 60.2% children 9-59% months consumed Vitamin A in the last 6 months (NFHS 4)

Consumption of IFA by Pregnant Women has increased: 15.2% in NFHS 3 to 30.2% in NFHS 4

*However, improvements have been slow. We are in danger of missing SDG2 if present trends continue*

# Complex, Interacting Drivers of Hidden Hunger

Social, Economic and Agricultural Drivers

AGRICULTURE

Food pricing of energy dense vs micronutrient rich food

DIET DIVERSITY LIMITED

INEQUITABLE GENDER ACCESS



## INEQUALITY IN FOOD INTAKE

The gap in consumption increases sharply with more nutritious food

Monthly per capita consumption expenditure (in Rs)

	Fractile 12 urban (top 5%)	Fractile 1 rural (bottom 5%)	Fractile 6 urban (40-50th percentile)	Fractile 6 rural (40-50th percentile)
Food	<b>2859.12</b>	315.84	<b>948.34</b>	659.1
Fresh fruits	<b>244.3</b>	3.99	<b>46.67</b>	21.61
Vegetables	<b>197.38</b>	52.32	<b>113.09</b>	88.49
Milk products	<b>420.8</b>	17.64	<b>159.55</b>	90.94
Pulses	<b>76.5</b>	22.11	<b>51.13</b>	38.14
Cereals	<b>224.51</b>	102.96	<b>166.11</b>	148.46
Eggs, fish, meat	<b>200.76</b>	13.87	<b>83.7</b>	54.83
Edible oil	<b>102.55</b>	26.45	<b>67.41</b>	50.91
Spices	<b>92.77</b>	24.23	<b>61.72</b>	44.77
Beverages	<b>180.53</b>	8.88	<b>49.44</b>	24.71

Source: NSSO

# The Diet Paradox

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We are world's largest producers of MILK and  
VEGETABLES & FRUITS.

Consumption, however, is limited



# PROPOSED SOLUTIONS

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# TARGETED INTERVENTIONS

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	<b>Supply Chain Stage</b>	<b>Estimated Cost (pppa)</b>
Bio Fortification	Crop Production Level	USD 1.6 million (National Total for Rice)
Food Fortification	Food Processing Level	USD 0.05 for Iodization USD 0.12 for others
Supplementation	Household Level	USD 1 – 1.2

*Ritchie and Reay, 2017*

# Suitability for population wide / demographic specific deficiencies

	Dietary diversification	Increased meat and dairy (or relevant substitute)	Reduction supply chain losses	Food processing fortification	Biofortification	Dietary supplementation
Iron	x	x		x	x	x
Calcium	x	x	x	x		x
Zinc	x			x	x	x
Vitamin A	x		x	x	x	x
Vitamin B <sub>6</sub>		x		x		x
Vitamin B <sub>12</sub>		x		x		x
Folate	x		x	x		x
Iodine				x		
Lysine		x		x		x

*The suitability of addressing population-wide and demographic-specific micronutrient deficiencies by food-based and targeted interventions. Additional discussion on the relative merits and demands of food-based and targeted interventions can be found in the Supplementary Discussion.*

# FORTIFICATION

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## NEAR TO LONG TERM STRATEGIES

### BIO FORTIFICATION

Success with Golden Rice, Iron Pearl Millet, Zinc Wheat

Widespread Use is still at least a decade away

### FORTIFICATION

Techniques available for DFS, Milk and Oil Fortification, Rice and Wheat Fortification

We have the FFRC working on these issues

Increasing fortification across India; huge possibilities in PDS, MDM, ICDS

Research and Close Monitoring Needed

# SUPPLEMENTATION

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**A NEAR TERM STRATEGY, NECESSARY BECAUSE OF WIDESPREAD DEFICIENCIES**

CONTINUED NEED TO TARGET PREGNANT AND LACTATING WOMEN & CHILDREN

MORE EFFICIENT SUPPLY AND DISTRIBUTION CHANNELS NEEDED

IMMEDIATE NEED TO EDUCATE THE PEOPLE

# A Project Tiger Moment?!

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Project Tiger led to protection resurgence of other fauna, and forests as well

**Anemia Mukt Bharat** can work in similar ways:

- The emphasis on behavior change, including diets
- Fortification as an intervention

Let us seize this moment!



# Three excellent opportunities to address Hidden Hunger

## **POSHAN ABHIYAN**

A number of initiatives are being implemented, including *Jan Andolan*; and convergence

Plans to decrease Anemia prevalence by 3% per year

## **DAY – NRLM**

A potential platform of Women; they also work on gender issues  
5.5 Crores reached thus far; target is 10 Crores

## The Focus on **Aspirational Districts**

Collectors responsible; focus on outcomes



# 2030 is not far away....

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There is **adequate data** for us to work upon

The **Solutions** are known

The **Technology** is there

The **Will** is also showing

We have **young professionals** willing to work on such challenges

Let us go in with **simple messaging** to change the scenario







The best  
way to predict  
the future  
is to create it.

- Peter Drucker