

## UNICEF India Nutrition Support 2018–22

### Strengthening the Evidence Base through the Comprehensive National Nutrition Survey

February 2023

#### PREVALENCE AND BURDEN OF MALNUTRITION IN CHILDREN UNDER FIVE YEARS OLD IN INDIA, NFHS-5<sup>i</sup>, (2019–21)<sup>ii</sup>

##### Stunting

Child too short (height) for his/her age

**35.5% | 46.2 million**

##### Wasting

Child too thin (weight) for his/her height

**19% | 24.9 million**

##### Overweight

Child's weight too high for his/her height

**3.4% | 4.4 million**

##### Anaemia

Condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal

**67% | 87.1 million**

## THE ISSUE

Good health, nutrition and wellbeing throughout the life cycle is a precursor to a healthy and productive living. India faces triple burden of malnutrition in terms of micronutrient deficiencies, undernutrition and quickly rising overnutrition rates in children under five years old.

Going beyond children, unmet nutrient and energy needs during late childhood and early adolescence can result in increased vulnerability to undernutrition and micronutrient deficiencies while excess intake can lead to overweight, obesity and increased risk of non-communicable diseases. In India, 561 million<sup>iii</sup> children and adolescents 5–19 years old constitute almost one third of total population (28.5 per cent) and require policy and programme investments to generate economic and social returns.

Prior to 2016, adequate, comprehensive and reliable national data on all-aged children and adolescents' nutrition to inform policy makers was limited on following aspects:

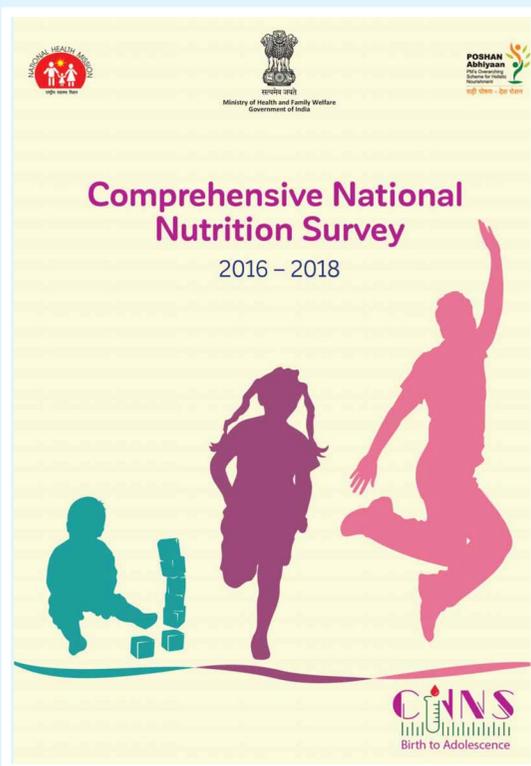
- The age groups in various national surveys usually covered women, children under five years of age and adolescents in the age group of 15–19 only. The age group between 5–14 years was missing
- The types of micronutrients assessed in surveys were limited to Iron and Iodine
- The methodology lacked precision – use of surrogate measures for a condition, crude estimations based on recalled dietary intakes, sampling bias, and use of different methodologies made comparison across surveys challenging
- Information on risk factors for non-communicable diseases linked to nutrition was missing

Ensuring India's children and adolescents are nourished and growing well is critical to achieving India's demographic dividend. Recognising the need, UNICEF stepped in to invest in this age group by bringing data and evidence on the table.

## THE INVESTMENT

UNICEF supported Ministry of Health and Family Welfare (MoHFW) to undertake the **Comprehensive National Nutrition Survey (CNNS)<sup>iv</sup>** in 2016 with the objective to estimate the **prevalence of dual burden of malnutrition** and assess the extent and severity of **micronutrient deficiencies in children and adolescents** as well as to assess **risk factors for non-communicable diseases among young and school-aged children and adolescents 10–19 years**.

A Technical Advisory Group composed of 12 institutions (government, academia, local and international laboratories, medical institutes, CDC and UNICEF) was formed under the leadership of the MoHFW and designated the Population Council as the lead implementation agency.<sup>v</sup> Beside the provision of technical guidance for the survey design, tools, protocols analysis and report writing, UNICEF was the main funder of the CNNS using its own resources and the generous financial support from Mr and Ms Aditya and Megha Mittal.



CNNS data was collected between March 2016 and October 2018 in all 29 States and Union Territory of Jammu and Kashmir. The report was published in 2019 by the MoHFW, Government of India. Further state-wise reports were also developed for state-level advocacy. Results and trend analysis are available on the [HealthNutritionINDIA.in](http://HealthNutritionINDIA.in) website hosted by MoHFW with UNICEF support.

**CNNS is the largest national micronutrient survey ever implemented globally. A total of 112,316 children and adolescents were measured, and care providers interviewed to**

**evaluate infant and young child-feeding practices; 51,029 blood, stool and urine samples were collected and analysed to measure deficiencies in Iron/Anaemia, Iodine, Zinc, Folates, Vitamin A and Vitamin B12 as well as biomarkers for non-communicable diseases.**

For the first time in Indian national surveys, the globally accepted SMART<sup>vi</sup> data quality assurance method was applied to ensure high anthropometric data reliability and gold standard methods were used to collect samples and analyse micronutrient deficiencies through internationally certified laboratories.

## THE RESULTS: How has CNNS contributed to policy and programmatic environment?

The high-quality data produced and the wealth of information generated rapidly fuelled into the policy dialogue on how to improve children and adolescents' nutrition. Findings from the CNNS contributed to the adjustment and development of a number of policies and programmes. The most salient findings and contributions are described below.

### Attention to the issue of nutrition

The release of the CNNS report in 2019 attracted immediate attention from the part of the parliamentarians contributing to 10 questions related to CNNS raised in the Parliament at the November 2019 winter session alone, i.e., 23 per cent of all questions raised during the winter session. In comparison, only 4 per cent (2,005 out of a total of 52,698 questions) were related to nutrition and raised at the Parliament between 2000 and 2021.<sup>vii</sup>

### Highlighted existence of multiple micronutrient deficiencies

CNNS confirmed rising levels of multiple micronutrient deficiencies, also called the hidden hunger (See table below). On the positive side, CNNS documented the effective elimination of iodine deficiency disorders across all states among the 1–19 years age-group.

#### Prevalence of single or two or more micronutrient deficiencies in pre-school-aged children aged 6–59 months in India<sup>viii</sup>

India	Children aged 6–59 months
Prevalence of any core deficiencies (Iron, Zinc or Vitamin A)	53%
Any sentinel deficiencies (Iron, Zinc, Vitamin A, D, B12 or Folate)	80%
Prevalence of two or more micronutrient deficiencies	40%

Source: [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(22\)00367-9/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(22)00367-9/fulltext)

## Deepened the understanding of non-communicable diseases, anaemia and its causes in boys and girls

With the inclusion of school-aged children (5–9 years) and adolescents (10–19 years), CNNS data not only provided information on anaemia and micronutrient status of children 0–19 years of age, but it also provided a detailed insight into the nutritional and non-nutritional causes of anaemia as per state:

- Only about half of anaemia is caused by iron deficiency
- The dietary intake of children and adolescents was found to be inadequate, with a high consumption of junk food and low intake of fruits and vegetables
- 24 per cent of adolescents were thin for their age (BMI-for-age  $<-2$  SD) while 5 per cent of adolescents were overweight or obese (BMI-for-age  $>+1$  SD). Anaemia and thinness co-exist
- One in ten school-aged children and adolescents were pre-diabetic
- Almost all adolescents failed to meet the daily requirements of physical activity for their age

## Sounded the alarm on overweight and obesity in children and adolescents

CNNS highlighted the fast-rising trend of overweight and obesity along with non-communicable diseases among Indian children and adolescents (from 0.4 per cent in 2006, NFHS-3, to around 2 per cent in 2016/18, NFHS-4 and CNNS). In addition, 5 per cent of adolescents (10–19 years old) were found with metabolic syndrome based on coexistence of at least three out of five measures of height/

waist circumference, hypertension, impaired glucose tolerance, hypertriglyceridemia and hypercholesterolemia.<sup>ix</sup>

In 2022, UNICEF partnered with the Public Health Foundation of India (PHFI) and launched on the World Obesity Day (4 March) the “Let’s Fix Our Food” initiative for the promotion of healthy diets *among* adolescents *through* adolescent participation and institutional capacity building *for* adolescent participation in public, policy and nutrition literacy discourse.

CNNS data has also been quoted for engagements with Government for the promotion of healthy diets and physical activities and curbing obesogenic lifestyle among school children and adolescents to prevent Non-Communicable Diseases in adulthood.<sup>x</sup>

## Enhanced data quality assurance in national surveys

Learning from the use of data quality assurance methods in CNNS and subsequent NFHS-5, 2019–21, the Indian Council of Medical Research (ICMR) issued in 2021 the [National Guidelines for Data Quality of Surveys](#) to guide advanced data quality monitoring, process audits and analytics, and capacity building of data collection agencies/producers to improve the quality of demographic, nutrition and health surveys.

## Opened-up opportunities for fresh learnings and data usage in scholarly periodicals and other published works

Since its release, CNNS data has been extensively used by experts and academic institutions. See Box [“List of publications using CNNS data \(2019–2022\)”](#).



## List of publications using CNNS data (2019–2022)

### Reports:

- UNICEF. Ministry of Health and Family Welfare (MoHFW), Government of India, UNICEF [Adolescents, Diets and Nutrition: Growing Well in a Changing World. The Comprehensive National Nutrition Survey](#). Thematic Reports, 2019.
- [Comprehensive National Nutrition Survey – National and State Level Factsheets](#).
- Overweight and Obesity in Children and Adolescents (0-19 years) in India Landscape Study, UNICEF and Institute of Economic Growth, 2021 [http://iegingdia.in/upload/project\\_studies/250621\\_143128repWil20.pdf](http://iegingdia.in/upload/project_studies/250621_143128repWil20.pdf).
- [New Global Estimates for Hidden Hunger](#). Advocacy brief 2022 Gainhealth.org.

### CNNS in academic literature:

- Abraham RA, et al. [Effect of temperature and time delay in centrifugation on stability of select biomarkers of nutrition and non-communicable diseases in blood samples](#). Biochem Med (Zagreb). 2019.
- Sarna A, et al. [Characterisation of the types of anaemia prevalent among children and adolescents aged 1–19 years in India: a population-based study](#). Lancet Child Adolescent Health. 2020.
- Kumar P, et al. [Comparison of hemoglobin concentrations measured by HemoCue and a hematology analyzer in Indian children and adolescents 1-19 years of age](#). Int J Lab Hemtol. 2020;00:1–5. April 2020 ca.
- Porwal A, et al. [Association of maternal height and body mass index with nutrition of children under 5 years of age in India: Evidence from Comprehensive National Nutrition Survey 2016–18](#). Asia Pac J Clin Nutr. 2021;30(4):675–686.
- Choudhary TS, et al. Analysis of wasting & severe wasting and its associated risk factors among under-5 children in India. In submission.
- Neufield L, et al. [Food choice in transition: adolescent autonomy, agency, and the food environment](#). The Lancet Adolescent Nutrition Series 2021.
- Raghu Pullakhandham, et al. [Prevalence of low serum zinc concentrations in Indian children and adolescents: findings from the Comprehensive National Nutrition Survey 2016-18](#). The American Journal of Clinical Nutrition. Volume 114, Issue 2, August 2021.
- Kulkarni B, et al. [Prevalence of Iron Deficiency and its Sociodemographic Patterning in Indian Children and Adolescents: Findings from the Comprehensive National Nutrition Survey 2016-18](#). The Journal of Nutrition. Volume 151, Issue 8, August 2021, Pages 2422–2434.

- Reddy GB, et al. [Prevalence of vitamin A deficiency in Indian children and adolescents: findings from the Comprehensive National Nutrition Survey 2016-18](#). Eur J Nutr. 2021 Jul 12.
- [Socio-economic inequality in anthropometric failure among children aged under 5 years in India: evidence from the Comprehensive National Nutrition Survey 2016-18](#).
- Johnston R, et al. [Methods for assessing seasonal and annual trends in wasting in Indian surveys \(NFHS-3, 4, RSOC & CNNS\)](#). PLoS One. 2021 Nov 22;16(11):e0260301.
- Raunak Bir, et al. Quality assurance of microscopic stool examination for intestinal parasites in children from the Comprehensive National Nutrition Survey 2016-18. In submission.
- Abraham RA, et al. [The Effects of a Single Freeze-Thaw Cycle on Concentrations of Nutritional, Noncommunicable Disease, and Inflammatory Biomarkers in Serum Samples](#). Journal of Laboratory Physics.
- de wagt Arjan. [Anaemia in Indians aged 10–19 years: Prevalence, burden and associated factors at national and regional levels](#). 2022 Maternal and Child Nutrition Wiley.
- Rana G, Abraham RA, Sachdev HS, Nair KM, Kumar GT, Agarwal PK, Johnston R, Wagt A, Sarna A, Acharya R, Porwal A, Khan N, Ramesh S, Bharti R, Kalaivani M, Ramakrishnan L. [Prevalence and Correlates of Vitamin D Deficiency Among Children and Adolescents From a Nationally Representative Survey in India](#). Indian Pediatr. 2023 PMID: 36604939.

### Other publications:

- Stevens GA. [Micronutrient deficiencies among preschool-aged children and women of reproductive age worldwide: a pooled analysis of individual-level data from population-representative surveys](#). Volume 10, Issue 11, November 2022, Pages e1590-e1599.
- Das K Jai, Padhani Zahra. [Alleviating hidden hunger: an infallible bridge to improved health and nutrition](#).
- Nimmahota Arlappa. [Vitamin A supplementation policy: A shift from universal to geographical targeted approach in India considered detrimental to health and nutritional status of under 5 years children](#). Eur J Clin Nutr. (2022). <https://doi.org/10.1038/s41430-022-01122-5>.

## Spotlight - Policy initiatives for school going children and adolescents post 2018

- CNNS thematic report on Adolescent, Diets and Nutrition was launched in October 2019 <https://anemiamukt Bharat.info/wp-content/uploads/2019/12/CNNS-Thematic-Report-Adolescents-Diets-and-Nutrition.pdf>
- CNNS data continues to inform policy level deliberations and discussions on the on-going Anemia Mukht Bharat (Anaemia Free India) programme strategy adaptation
- In 2018, the Food Safety and Standards Authority of India (FSSAI) launched [Eat Right India](#) movement as a large-scale effort to transform the country's food system in order to ensure safe, healthy and sustainable food for all Indians using a judicious mix of regulatory, capacity building, collaborative and empowerment approaches and building on the collective action of all stakeholders (government, food businesses, civil society organisations, experts and professionals, development agencies and citizens at large)
- In 2020, FSSAI issued an order which restricts the sale of junk and unhealthy food in canteens of schools and educational institutions<sup>xi,xii</sup> and is planning to introduce “front of package label” to regulate junk foods (national dialogues on-going)
- In 2021, the Government of India announced mandatory rice fortification with Iron, Folates and Vitamin B12 in all social safety net schemes by 2024 as a preventive and cost-efficient complementary strategy to combat multiple micronutrient deficiencies. This includes supplementary nutrition for children in the Integrated Child Development Services (ICDS) and school midday meals.<sup>xiii</sup>
- In 2021, the Government also published a handbook for States and Union Territories on daily recommendations and food fortification.<sup>xiv</sup>
- In 2022, to diversify protein-rich food sources as a step to fight malnutrition among school-aged children (6–10 years), the Government approved the availability of black grams at discounted rates and increased the fund allocation for purchase of pulses under the Prime Minister POSHAN school midday meals programme.<sup>xv</sup>
- Under POSHAN 2.0 launched in 2021, the supplementary nutrition programme scheme was revised to include the 14–18 years old girls' group in the targeted beneficiaries in under-performing districts (called “aspirational districts”) and North-Eastern states including Assam. This is expected to benefit about 12.6 million adolescent girls aged 14–18 years.<sup>xvi,xvii</sup>

## CONCLUSIONS AND WAYS FORWARD

UNICEF supported the CNNS primarily to contribute to addressing a knowledge gap on micronutrient deficiencies and non-communicable diseases risks in school-aged children and adolescents. The wealth of data and information generated have been, and still are keys for the entire nutrition community to take appropriate measures in terms of policies and programmatic approaches for improved nutrition in India.

Under the leadership of the MoHFW, the CNNS highlights an impressive journey of coordination, stewardship, logistic, interpretation and dissemination of findings to policy makers and programme managers.

With 4 years of hindsight, we can affirm that the CNNS has been and continues to be a rich resource for academia and policy makers, as also evidenced by the continuing new publications of further analyses and interpretation of the CNNS data. It is also anticipated that CNNS will continue to inform policies and strategies in coming years.

As UNICEF India enters into a new programme cycle (2023–2027), UNICEF Nutrition will continue to use CNNS data to actively contribute to evidence generation for policy and programmatic change, especially around its five identified priorities focusing on - foods and diets in early childhood; timely and early detection of growth failure; addressing low-birth weight and wasting in children under six months old; adolescent and maternal nutrition with focus on anaemia and diets and women's nutrition during pregnancy.

### Contact:

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## References:

- i International Institute of Population Sciences (IIPS) and ICF. 2021. National Family Health Survey, 2019-21: India: Vol-1, Mumbai: IIPS
- ii Under 5 years of age population derived from AMB target 2022-23 and prevalence rates as per NFHS-5
- iii Population derived from Census of India 2011, [Population Projection for India and States 2011-2036 Population Projection Report 2011-2036 - upload\\_compressed\\_0.pdf \(mohfw.gov.in\)](#) and [India Population growth rate 1950 to 2022 India Population Growth Rate 1950-2022 | MacroTrends](#)
- iv Ministry of Health and Family Welfare (MoHFW), Government of India, UNICEF and Population Council. 2019. Comprehensive National Nutrition Survey (CNNS) National Report. New Delhi. full report [untitled \(nhm.gov.in\)](#)
- v Members of the CNNS Technical Advisory Group: KANTAR Public, Gfk Mode Pvt. Ltd, SIGMA Research and Consulting Pvt. Ltd and Indian Institute of Health Management Research, Jaipur (data collection), SRL Ltd (Biological sample collection), The Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh and Kalawati Saran Children's Hospital, New Delhi (concurrent monitoring support for the household survey and anthropometric measurements), The US Centre for Disease Control and Prevention (CDC) in Atlanta, USA. All India Institute of Medical Sciences (AIIMS), Delhi, ICMR-National Institute of Nutrition (NIN), Hyderabad, The Clinical Development Services Agency (CDSA) unit of Translational Health Science & Technology Institute, Dept. of Biotechnology, India (quality assurance support for data collection and laboratory analysis of bio samples)
- vi SMART: Standardised Monitoring and Assessment of Relief and Transitions; <https://smartmethodology.org/about-smart/> accessed on 23.2.2023
- vii Sripada, J., Raman, S., Sharma, N. D., Johnston, R., Chamois, S., de Wagt, A., & Sarwal, R. (2023). PARLIAMENTARY DISCOURSE ON NUTRITION: What motivates law makers to ask questions (No. xb4n3). Center for Open Science. <https://osf.io/xb4n3/>
- viii Stevens, G. A., Beal, T., Mbuya, M. N., Luo, H., Neufeld, L. M., Addo, O. Y., ... & Young, M. F. (2022). Micronutrient deficiencies among preschool-aged children and women of reproductive age worldwide: a pooled analysis of individual-level data from population-representative surveys. *The Lancet Global Health*, 10(11), e1590-e1599.
- ix Ramesh, S., Abraham, R. A., Sarna, A., Sachdev, H. S., Porwal, A., Khan, N., ... & Ramakrishnan, L. (2022). Prevalence of metabolic syndrome among adolescents in India: a population-based study. *BMC Endocrine Disorders*, 22(1), 1-10. [Prevalence of metabolic syndrome among adolescents in India: a population-based study | BMC Endocrine Disorders | Full Text \(biomedcentral.com\)](#)
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- xi Lok Sabha Question no 39, answered on 3.02.2023; [Questions : Lok Sabha](#)
- xii Ministry of Health and Family Welfare, Press release dated 8.02.2019 <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1563528>
- xiii Cabinet Committee on Economic Affairs (CCEA), Government of India, Press release dated 8.04.2022, <https://pib.gov.in/PressReleasePage.aspx?PRID=1814826> accessed on 23.02.2023
- xiv FSSAI, Daily Recommendation and Food fortification: A Handbook for States and UTs. N.d. book ([fssai.gov.in](https://fssai.gov.in)) accessed on 23.02.2023
- xv Ministry of Information and Broadcasting, Government of India, Press release dated 31.08.2022 <https://pib.gov.in/PressReleaselframePage.aspx?PRID=1855677> accessed on 23.02.2023
- xvi Ministry of Information and Broadcasting, Govt of India, Press release dated 15 Sept 2022, Rashtriya Poshan Mah: Poshan Abhiyan to make India malnutrition free by 2022 (MWCD) available on [doc2022922107701.pdf \(pib.gov.in\)](#) accessed on 16.12.2022
- xvii Government of India, Ministry of Women and Child Development. Press information Bureau press release dated 1 Apr 2022, Study on Impact of Poshan Abhiyan. Available on [Study On Impact Of Poshan Abhiyan \(pib.gov.in\)](#) accessed on 16.12.2022