COMPREHENSIVE NUTRIENT GAP ASSESSMENT (CONGA)

FINDINGS FOR CHILDREN 6–23 MONTHS IN INDIA

April 2020
INTRODUCTION

Improving young children’s diets in South Asia contributes to the prevention of all forms of malnutrition, including micronutrient deficiencies, and is an important component of efforts to achieve the global nutrition targets of the World Health Assembly (WHA) and Sustainable Development Goals (SDGs).

After a child’s first six months, nutrient requirements exceed what breastmilk alone can provide. To meet growing nutrient needs and ensure proper growth and development, along with breastfeeding, infants should be introduced to nutrient-dense solid, semi-solid, or soft foods at six months of age (1, 2). Despite this, only 21% of infants and young children aged 6–23 months in India consume a diet containing the minimum recommended number of food groups (3), increasing their risk of micronutrient deficiencies and growth faltering.

This brief summarizes the main food and micronutrient gaps identified from a Comprehensive Nutrient Gap Assessment (CONGA) conducted for India, as part of a landscape analysis on complementary feeding in South Asia, and key policy and programmatic implications.

WHY IS CONGA NEEDED?

Identification of nutrient and dietary gaps during the complementary feeding period is essential to inform policies and programs designed to improve child health and nutrition. However, nationally representative data specific to young children are usually only available for select nutrients and infrequently collected. Alternative sources of evidence can help fill data gaps, even if they are of lower quality, particularly when multiple sources point to the same nutrients of concern or dietary issues. Yet decision makers have little guidance on how to locate and interpret the evidence to identify the magnitude and significance of nutrient gaps in child diets, given the wide range of indicators used, diversity of data sources and population characteristics, and differences in severity of associated health outcomes.

KEY MESSAGES

- Based on available evidence, iron, vitamin A, zinc, vitamin B₁₂, folate, and calcium are micronutrients of concern among young children (6–23 months of age) in India.

- More research is required on other nutrients, like niacin, which may also represent important gaps in young children’s diets in India.

- The best food sources of micronutrients of concern in India are chicken liver (iron, vitamin A, zinc, vitamin B₁₂, folate), goat/mutton liver (vitamin A, iron, vitamin B₁₂, folate), goat/mutton (zinc, iron, vitamin B₁₂), dark green leafy vegetables (iron, vitamin A, calcium, folate), dairy (vitamin A, calcium, zinc, vitamin B₁₂), eggs (zinc, vitamin A, folate, vitamin B₁₂), dried beans (zinc, iron, folate), fish (vitamin A, vitamin B₁₂), chicken (zinc, vitamin B₁₂), groundnuts (zinc, folate), and orange/yellow fruits and vegetables (vitamin A).

- More research is needed to understand the primary barriers to consuming these foods, such as limited availability, accessibility, affordability, or desirability.

- Biofortification, fortification, and supplementation can also help fill gaps for micronutrients of concern, particularly where food insecurity, social norms, palatability, and desirability make sufficient consumption from accessible diverse foods infeasible.
A Comprehensive Nutrient Gap Assessment (CONGA) meets this need by collating the evidence and rating the burden of nutrient gaps and certainty of evidence. There are several other nutrients that may be limited in the diets of young children, including omega-3 fats (e.g., DHA) and specific essential amino acids (i.e., the quality of protein). The CONGA method can be extended in the future to these and other nutrients as more data becomes available.

**HOW DOES CONGA WORK?**

We reviewed and summarized findings from nationally representative and high-quality sub-national surveys, grey literature, and journal articles related to infant and young child feeding practices, micronutrient deficiencies, dietary intake, household consumption and expenditure, and the food supply. The evidence was reviewed to rate the burden of gap (none, low, moderate, or high) and certainty of available evidence (low, moderate, or high) for 11 micronutrients commonly lacking in young children’s diets. We then identified the most nutrient-dense, locally available food sources of key problem nutrients based on nutrient content and local availability, using local and United States Department of Agriculture (USDA) food composition tables and data on household food consumption and food prices in India.

**WHAT DID CONGA FIND IN INDIA?**

Based on available evidence, micronutrients of concern during the complementary feeding period in India are iron, vitamin A, zinc, vitamin B₁₂, folate, and calcium (Table 1). The annex provides detailed evidence and respective references considered for all ratings. There is likely considerable geographic variation in nutrient gaps subnationally, which is not assessed. Consequences of deficiencies in micronutrients of concern and justifications for their ratings are summarized in brief below.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Gap burden</th>
<th>Evidence certainty</th>
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<tbody>
<tr>
<td>Iron</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Zinc</td>
<td>Mod</td>
<td>High</td>
</tr>
<tr>
<td>Vit B₁₂</td>
<td>Mod</td>
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<td>Folate</td>
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<tr>
<td>Ca</td>
<td>Mod</td>
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<tr>
<td>Niacin</td>
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<tr>
<td>Iodine</td>
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<td>Vit B₆</td>
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<tr>
<td>Vit C</td>
<td>Low</td>
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</table>

**Iron**

Iron deficiency is a primary cause of anemia and can result in cognitive impairment, decreased work productivity, and death (4). Data indicate low iron intake in young children as well as very low intake of iron-rich foods during the complementary feeding period. Recent national estimates indicate a high prevalence of iron deficiency in young children. There is also low availability of iron in the national food supply.

**Vitamin A**

Vitamin A deficiency has severe consequences, even with mild deficiency, including night blindness, increased susceptibility to infections, and death (5). Data indicate low intake of vitamin A-rich foods during the complementary feeding period and consistently inadequate intake of vitamin A in young

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1 Micronutrients of concern are those with at least a moderate burden gap and moderate certainty of evidence. There may also be other important nutrient gaps, but evidence is limited.

2 Ca, Calcium; Mod, Moderate; Vit, Vitamin.
children over time. Recent national estimates of vitamin A deficiency prevalence in children indicate a problem of moderate public health significance in India.

**Zinc**
Zinc deficiency in children is associated with poor health, increased risk of diarrhea, and impaired cognitive and motor development (6, 7). Data indicate very low intake of zinc-rich foods during the complementary feeding period, and recent national survey estimates indicate a moderate prevalence of zinc deficiency in children.

**Vitamin B₁₂**
Vitamin B₁₂ deficiency in infants has immediate and long-term consequences including anemia, developmental regression, and depression during adulthood (8, 9). Data indicate low intake of vitamin B₁₂-rich foods during the complementary feeding period, and recent national survey estimates indicate a moderate prevalence of vitamin B₁₂ deficiency in children.

**Folate**
Folate deficiency in infants and young children can have immediate and long-term consequences, including anemia, hindered brain development, and adult depression (8). Data indicate low folate intake in young children, and recent national survey estimates indicate a moderate prevalence of folate deficiency in children.

**Calcium**
Calcium deficiency increases risk of rickets, but the broader health implications of deficiency in young children are poorly understood (10). Consumption of dairy during the complementary feeding period is low, and calcium intake for both young children and adults is below recommended levels (and not improving). However, no biochemical data were available to indicate the level of calcium deficiency.

**Other micronutrients**
The burden of the iodine gap was rated low based on high certainty evidence. The burden of the niacin gap was rated moderate based on low certainty evidence. The burdens of thiamine, vitamin C, and vitamin B₆ gaps were rated low based on low certainty evidence. More data is needed to generate higher quality evidence on the burden of these nutrient gaps in India, particularly for niacin. We did not assess the burden of the vitamin D gap, but recent evidence suggests it may also be a concern (3).

**WHAT CAN BE DONE TO ADDRESS THESE GAPS?**
Recommended actions to address each nutrient gap in India are summarized in Table 2. Strategic actions to improve child diets will require engagement and intervention across relevant systems (food, social protection, health, and WASH) to address both supply- and demand-side barriers. The best complementary food sources of micronutrients of concern are chicken liver (iron, vitamin A, zinc, vitamin B₁₂, folate), goat/mutton liver (vitamin A, iron, vitamin B₁₂, folate), goat/mutton (zinc, iron, vitamin B₁₂), dark green leafy vegetables (iron, vitamin A, calcium, folate), dairy (vitamin A, calcium, zinc, vitamin B₁₂), eggs (zinc, vitamin A, folate, vitamin B₁₂), dried beans (zinc, iron, folate), fish (vitamin A, vitamin B₁₂), chicken (zinc, vitamin B₁₂), groundnuts (zinc, folate), and orange/yellow fruits and vegetables (vitamin A) (Table 2). More research is needed to understand the primary barriers to
consuming these foods, like limited availability, accessibility, affordability, or desirability, and where prevailing dietary preference at household level (vegetarian and non-vegetarian) prevent consumption of these foods. Biofortified and fortified foods (including fortified complementary foods) and point-of-use fortification products such as micronutrient powders and lipid-based nutrient supplements can also help fill nutrient gaps, particularly for vegetarian populations. Continued breastfeeding prevalence in India is high at both one and two years of age at 86% and 80%, respectively (11). Efforts to maintain continued breastfeeding should be prioritized to help meet vitamin A and calcium needs. Improving the quality of pregnant and lactating women’s diets can also improve their children’s nutrition through improved birth outcomes, nutrient transfers at birth, and more nutrient-dense breast milk (12). Behavioral aspects influencing feeding practices also need to be addressed.

Table 2. Recommended actions to address complementary feeding gaps in India

<table>
<thead>
<tr>
<th>Nutrient gap</th>
<th>Recommended actions to increase dietary intake</th>
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</table>
| Iron         | • Assess and ensure availability, accessibility, affordability, and desirability of natural foods rich in iron, including chicken liver, goat/mutton liver, goat/mutton, dark green leafy vegetables, and lentils/chickpeas, as well as iron-biofortified and fortified foods.  
• Ensure adequate coverage and quality of large-scale iron fortification.  
• Expand coverage of iron supplementation and consider micronutrient powders.³ |
| Vitamin A    | • Maintain high rates of continued breastfeeding.  
• Assess and ensure availability, accessibility, affordability, and desirability of natural foods rich in vitamin A, including goat/mutton liver, chicken liver, orange/yellow fruits and vegetables, dark green leafy vegetables, eggs, dairy, and fish, as well as vitamin A-biofortified and fortified foods.  
• Ensure adequate coverage and quality of large-scale vitamin A fortification.  
• Consider micronutrient powders and/or continued supplementation. |
| Zinc         | • Assess and ensure availability, accessibility, affordability, and desirability of natural foods rich in zinc, including goat/mutton, chicken liver, chicken, groundnuts, eggs, lentils/chickpeas, and dairy, as well as zinc-biofortified and fortified foods.  
• Ensure adequate coverage and quality of large-scale zinc fortification.  
• Consider micronutrient powders. |

³ Some potential risks have been associated with supplemental iron in children with adequate iron status. Products with low iron doses may be more appropriate in this context.
<table>
<thead>
<tr>
<th>Nutrient gap</th>
<th>Recommended actions to increase dietary intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc (continued)</td>
<td>• Ensure <strong>adequate coverage and quality of zinc supplementation</strong> for diarrhea treatment.</td>
</tr>
</tbody>
</table>
| Vitamin B₁₂ | • Assess and ensure availability, accessibility, affordability, and desirability of natural foods rich in vitamin B₁₂, including goat/mutton liver, chicken liver, fish, goat/mutton, eggs, dairy, and chicken, as well as vitamin B₁₂-fortified foods.  
  • Ensure **adequate coverage and quality of large-scale vitamin B₁₂ fortification**.  
  • Consider **micronutrient powders and/or supplementation**. |
| Folate | • Assess and ensure availability, accessibility, affordability, and desirability of natural foods rich in folate, including goat/mutton liver, chicken liver, lentils/chickpeas, groundnuts, dark green leafy vegetables, okra, and eggs, as well as folate-fortified foods.  
  • Ensure **adequate coverage and quality of large-scale folic acid fortification**.  
  • Consider **micronutrient powders and/or supplementation**. |
| Calcium | • Maintain high rates of **continued breastfeeding**.  
  • Assess and ensure availability, accessibility, affordability, and desirability of natural foods rich in calcium, including dark green leafy vegetables and dairy, as well as calcium-fortified foods.  
  • Consider calcium-containing **micronutrient powders and/or supplementation**.  
  • Collect **biochemical and dietary data** in young children. |

**CONCLUSION**

There is clear evidence of significant gaps in iron, vitamin A, zinc, vitamin B₁₂, folate, and calcium in young children’s diets during the complementary feeding period (6–23 months) in India. There may also be other important nutrient gaps, but evidence is limited, and there is likely subnational geographic variation in the magnitude of these gaps. The best food sources of micronutrients of concern that are relatively available in India are chicken liver, goat/mutton liver, goat/mutton, dark green leafy vegetables, dairy, eggs, dried beans, fish, chicken, groundnuts, and orange/yellow fruits and vegetables. These foods need to be available, accessible, affordable, and desirable as complementary foods to be consumed in adequate quantities by young children. Other approaches to fill gaps for micronutrients of concern should also be considered, including biofortification, fortification, and supplementation, particularly where food insecurity, prevailing social norms and feeding practices, palatability, and desirability make sufficient consumption from accessible diverse foods infeasible. Continued breastfeeding should be encouraged and can help young children consume enough vitamin A and calcium.
REFERENCES


### Iron

**Biochemical data:** National prevalence of iron deficiency in children 1–4 years was 32% in 2016/18 CNNS (defined serum ferritin < 12 μg/L). Prevalence was highest in children 12–23 mo (48%) and varied widely between states (4%–67%). Anemia prevalence in children 1–4 years was 41% in the 2016/18 CNNS, with approximately 50% of anemic children also suffering from iron deficiency (1). The 2015/16 NFHS estimated national anemia prevalence in children 6–59 mo to be 59% (a decrease from 70% in the 2005/6 NFHS), (2,3) based on available evidence, the prevalence of iron deficiency thus likely ranges between 15 and 50% (4).

**Dietary data:** Only 9% of children 6–23 mo consumed iron-rich foods in the past 24 h nationally according to the 2016/18 CNNS (1). The 2015/16 NFHS found that 18% of children 6–23 mo consumed iron-rich foods in the past 24 h nationally (slight increase from 10% the 2005/6 NFHS) and ~60% of districts reported < 25% of their children 6–23 mo consumed iron-rich foods (2,3.5).

**Nutrient intake in children:** The 2011/12 rural NNMB assessment reported nutrient intake as a percent of the Indian RDA, through time. Iron intake in children aged 1–3 y decreased over time, to between 50–60% of the Indian RDA in 2011/12 (6,7).

**Nutrient intake in adults:** The 2011/12 rural NNMB assessment reported nutrient intake in sedentary adult men and women, as a percent of the Indian RDA, through time. Between 1996/97 and 2011/12, iron intake decreased from > 100% of RDA to 91% in men and 65% in women (7). A 2015/16 NNMB survey carried out solely in urban areas in 16 states found iron intake at the household level was 78% of the Indian RDA (8).

**Food supply nutrient availability:** The amount of iron available in the food supply was estimated to be inadequate for 90% of the national population in 2011 (9).

**Supplementation:** Coverage of national iron supplementation for children 6–59 mo (in the 7 days preceding interview) was 26% in the 2015/16 NFHS (increase from 5% in the 2005/6 NFHS) (2,3). The 2013/14 RSOC found that only 13% of children 6–59 mo received an iron supplement in the 6 months preceding the survey (10).

### Vitamin A

**Biochemical data:** National prevalence of vitamin A deficiency (serum retinol < 20 μg/dL) in children 1–4 years was 18% in the 2016/18 CNNS, but 12 states have prevalence ≥ 20%, indicating a problem of severe public health significance (1). Previous estimates of vitamin A deficiency in children aged 1–5 y were derived from a 2002/03 rural NNMB survey in 8 states and showed prevalence of Bitot spots was found to be 0.8%, and prevalence of vitamin A deficiency (based on serum retinol < 20 μg/dL) was 62% (11). A 2011/12 rural NNMB survey in 10 states found prevalence of Bitot spots to be 0.3% in children aged 1–5 y (this 2011/12 survey did not report data on serum retinol) (7).

**Dietary data:** 44% of children 6–23 mo consumed vitamin A-rich foods in the past 24 h nationally in the 2015/16 NFHS (slight increase from 38% in the 2005/6 NFHS) (2,3), and 36% consumed vitamin A-rich foods in the 2013/14 RSOC (10).

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4  CNNS, Comprehensive National Nutrition; DHS, Demographic and Health Survey; h, hours; Mod, Moderate; mo, months; NFHS, National Family Health Survey, NISI, National Iodine and Salt Intake; NNMB, National Nutrition Monitoring Bureau; RDA, Recommended Dietary Allowance; RSOC, Rapid Survey on Children; y, years.
### Vitamin A (continued)

**Nutrient intake in children:** The 2011/12 rural NNMB assessment reported nutrient intake as a percent of the Indian RDA, through time. Median vitamin A intake in children 1–3 y was well below (< 50%) of the Indian RDA for more than two decades (6).

**Nutrient intake in adults:** The 2011/12 rural NNMB assessment reported nutrient intake in sedentary adult men and women, as a percent of the Indian RDA, through time. The 2011/12 rural NNMB assessment reported nutrient intake in sedentary adult men and women, as a percent of the Indian RDA, through time. Between 1996/97 and 2011/12, vitamin A intake remained between ~50–60% of RDA for both population groups (7). A 2015/16 NNMB survey carried out solely in urban areas in 16 states found vitamin A intake at the household level was only 23% of the Indian RDA (8).

**Food supply nutrient availability:** The amount of vitamin A available in the food supply was estimated to be inadequate for 24% of the national population in 2009 (12) and 66% of the national population in 2011 (9).

**Supplementation:** Vitamin A supplementation coverage for children 6–59 mo was 59% in the 2015/16 NFHS (a large increase from 16% in the 2005/06 NFHS) (2,3), and 35% in the 2013/14 (10).

### Zinc

**Biochemical data:** National prevalence of zinc deficiency (serum zinc < 65 μg/dl) in children 1–4 years was 19% in the 2016/18 CNNS, but prevalence varied widely by state (from 1% in Nagaland to 41% in Himachal Pradesh) (1).

**Dietary data:** 7% of breastfed and 14% non-breastfed children 6–23 mo consumed meat, fish, or poultry in the past 24 h nationally in the 2015/16 NFHS (no significant change from the 2005/6 NFHS) (2,3), and 7% and 11% of breastfed and non-breastfed children 6–23 mo, respectively, consumed flesh foods in the 2013/14 RSOC (10).

**Food supply nutrient availability:** The amount of zinc available in the food supply was estimated to be inadequate for 46% of the national population in 2009 (12) and 51% of the national population in 2011 (9).

### Vitamin B₁₂

**Biochemical data:** National prevalence of vitamin B₁₂ deficiency (serum vitamin B₁₂ < 203 pg/ml) in children 1–4 years was 17% in the 2016/18 CNNS, but prevalence varied by state (from 2% in West Bengal to 29% in Gujarat). Prevalence of deficiency increased to 31% in adolescents 10–19 years (1).

**Dietary data:** Of breastfed children 6–23 mo, 7% consumed meat, fish, or poultry, 37% consumed animal milk, 15% consumed cheese, yogurt or other milk products, and 13% consumed eggs in the past 24 h nationally in the 2015/16 NFHS. Of non-breastfed children 6–23 mo, 14% consumed meat, fish, or poultry, 61% consumed animal milk, 26% consumed cheese, yogurt or other milk products, and 22% consumed eggs in the past 24 h nationally in the 2015/16 NFHS (2).

**Food supply nutrient availability:** The amount of vitamin B₁₂ available in the food supply was estimated to be inadequate for 99% of the national population in 2009 (12) and 37% of the national population in 2011 (9).

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5 The estimates for consumption of animal milk are for all children 6–23 months, however, it is recommended that children under 12 months of age do not consume milks (flavored or plain) (13).
### Folate

**Biochemical data:** National prevalence of folate deficiency (erythrocyte folate < 151 ng/ml) in children 1–4 years was 23% the 2016/18 CNNS (1).

**Nutrient intake in children:** The 2011/12 rural NNMB assessment reported nutrient intake as a percent of the Indian RDA, through time. Intake of free folate in children 1–3 y was 24% of the Indian RDA in 2011/12, but no data was available from previous years (6,7).

**Nutrient intake in adults:** A 2015/16 NNMB survey carried out solely in urban areas in 16 states found dietary folate intake at the household level was 101% of the Indian RDA (8).

**Food supply nutrient availability:** The amount of folate available in the food supply was estimated to be inadequate for 50% of the total population in 2009 (12) and 19% of the total population in 2011 (9).

### Calcium

**Dietary data:** 37% and 61% of breastfed children and non-breastfed children 6–23 mo, respectively, consumed animal milk and 15% and 26%, respectively, consumed cheese, yogurt or other milk products in the past 24 h nationally in the 2015/16 NFHS (2). Consumption of animal milk in breastfed and non-breasted children 6–23 mo to be 32% and 56%, respectively, while consumption of other dairy products was 7% and 13%, respectively, in the 2013/14 RSOC (10).

**Nutrient intake in children:** The 2011/12 rural NNMB assessment reported nutrient intake as a percent of the Indian RDA, through time. Calcium intake in children aged 1–3 y was < 50% of the Indian RDA in 2011/12 and had not improved in more than two decades (6,7).

**Nutrient intake in adults:** The 2011/12 rural NNMB assessment reported nutrient intake in sedentary adult men and women, as a percent of the Indian RDA, through time. Between 1996/97 and 2011/12, calcium intake decreased from ~100% of RDA to ~70% of RDA (7). A 2015/16 NNMB survey carried out solely in urban areas in 16 states found calcium intake at the household level was 67% of the Indian RDA (8).

**Food supply nutrient availability:** The amount of calcium available in the food supply was estimated to be inadequate for 86% of the national population in 2009 (12) and 55% of the national population in 2011 (9).

### Niacin

**Dietary data:** 7% of breastfed and 14% non-breastfed children 6–23 mo consumed meat, fish, or poultry (the highest sources of niacin) in the past 24 h nationally in the 2015/16 NFHS (2,3), and 7% and 11% of breastfed and non-breasted children 6–23 mo, respectively, consumed flesh foods in the 2013/14 RSOC (10).

**Nutrient intake in children:** The 2011/12 rural NNMB assessment reported nutrient intake as a percent of the Indian RDA, through time. Niacin intake in children 1–3 y remained between 60–70% of the Indian RDA for more than two decades (6,7).

**Nutrient intake in adults:** The 2011/12 rural NNMB assessment reported nutrient intake in sedentary adult men and women, as a percent of the Indian RDA, through time. Between 1996/97 and 2011/12, niacin intake remained ~100% of RDA (7). A 2015/16 NNMB survey carried out solely in urban areas in 16 states found niacin intake at the household level was 61% of the Indian RDA (8).

**Food supply nutrient availability:** The amount of niacin available in the food supply was estimated to be inadequate for 9% of the national population in 2011 (9).

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### Iodine

**Biochemical data:** The median urinary iodine concentration of children 1–4 y was 213 μg/L in the 2016/18 CNNS. Using a cut-off of < 50 μg/L for suboptimal intake, 5% of children 1–4 y were reported to have low intake of iodine (1). The 2014/15 NISI survey estimated the national median urinary iodine concentration for women of reproductive age (15–49 years); was 158 μg/L (14). The 2011/12 NNMB rural survey estimated total goiter rate to be 0.8% and 2.3% in adolescent boys and girls aged 12–17y, respectively (7).

**Household iodized salt coverage:** 93% of households had iodized salt in the 2015/16 NFHS (2). The 2014/15 NISI found household coverage of adequately iodized salt was 78% (14).

### Vitamin B₁

**Dietary data:** 63% of breastfed and 71% of non-breastfed children 6–23 mo consumed grains (whole grains contain moderate amounts of thiamine) in the past 24 h nationally in the 2015/16 NFHS (slight decrease from the 2005/6 NFHS) (2,3), and 70% and 83% of breastfed and non-breasted children 6–23 mo, respectively, consumed grains in the 2013/14 RSOG (10).

**Nutrient intake in children:** The 2011/12 rural NNMB assessment reported nutrient intake as a percent of the Indian RDA, through time. Thiamine intake in children 1–3 y was 100% of the Indian RDA in 2011/12, and remained consistently high for more than two decades (6,7).

**Nutrient intake in adults:** The 2011/12 rural NNMB assessment reported nutrient intake in sedentary adult men and women, as a percent of the Indian RDA, through time. Between 1996/97 and 2011/12, thiamine intake consistently remained > 100% of RDA (7). A 2015/16 NNMB survey carried out solely in urban areas in 16 states found thiamine intake at the household level was 83% of the Indian RDA (8).

**Food supply nutrient availability:** The amount of thiamine available in the food supply was estimated to be inadequate for 15% of the national population in 2009 (12) and 14% of the national population in 2011 (9).

### Vitamin C

**Nutrient intake in children:** The 2011/12 rural NNMB assessment reported nutrient intake as a percent of the Indian RDA, through time. Vitamin C intake in children 1–3 y was < 50% of the Indian RDA in 2011/12, and has not improved in more than two decades (6,7).

**Nutrient intake in adults:** The 2011/12 rural NNMB assessment reported nutrient intake in sedentary adult men and women, as a percent of the Indian RDA, through time. Between 1996/97 and 2011/12, vitamin C intake consistently remained > 100% of RDA (7). A 2015/16 NNMB survey carried out solely in urban areas in 16 states found vitamin C intake at the household level was 128% of the Indian RDA (8).

**Food supply nutrient availability:** The amount of vitamin C available in the food supply was estimated to be inadequate for 17% of the national population in 2011 (9).

### Vitamin B₆

**Food supply nutrient availability:** The amount of vitamin B₆ available in the food supply estimated to be inadequate for 0% of the population in 2011 (9).
ANNEX REFERENCES


