

What lies at the root of child undernutrition in India?

Understanding trends and patterns in underlying determinants between 2006 and 2016

ABOUT THIS DATA NOTE

Adequate food, good health and optimal care are the most proximal determinants of child nutrition. In India, two major government-run programs, the Integrated Child Development Services and the National Health Mission, deliver interventions that support these determinants. However, there is more to it than what meets the eye.

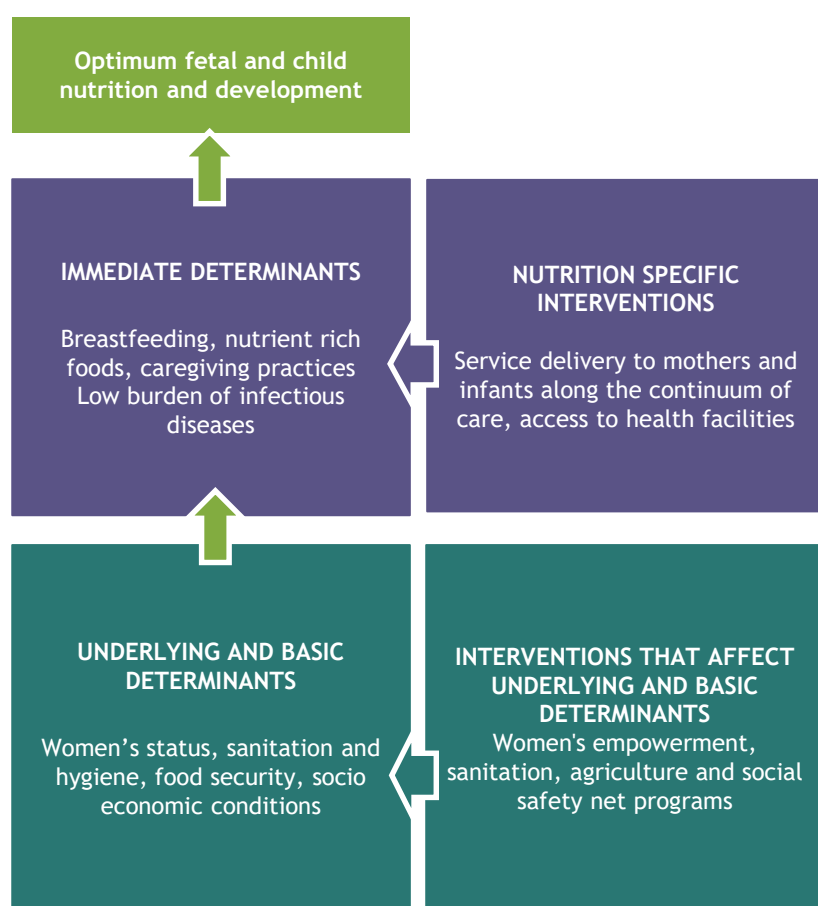
At the household and community level, parental education, women’s status, household food security, hygiene and socio-economic conditions play a critical role in ensuring optimal child nutrition (Corsi et al., 2016; Menon et al., 2018). These are the underlying and basic determinants of undernutrition. Interventions including social-safety net programs, sanitation programs, and programs addressing women’s empowerment and agriculture are aimed at improving these determinants.

Disruptions due to COVID-19 pandemic have seriously impacted several of these underlying determinants. Policy responses to contain the pandemic resulted in job and income losses, high levels of food insecurity, and school closures.

While income loss and food insecurity have immediate implications for food, health, and care of mothers and children; sustained over a period, these are likely to have long-term implications on child nutrition outcomes (Kim et al., 2019). Additionally, the poor status of these determinants prior to COVID-19 has likely exacerbated conditions for women and children during the pandemic. Therefore, it is more important than even before, that strong policy focus is placed on programs and policies that can address these underlying determinants.

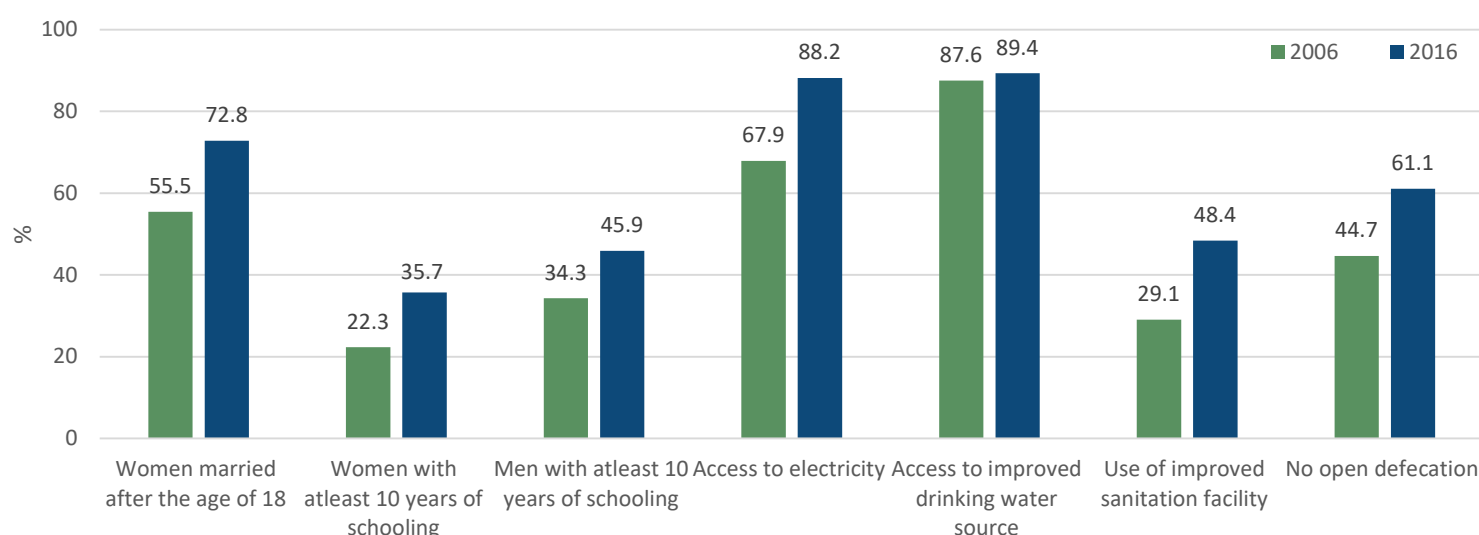
This *Data Note* describes the key trends and patterns in some of these underlying determinants in India. It summarizes state and district data from the third and fourth rounds of India’s National Family Health Surveys (2006 & 2016). While this is pre-COVID-19 era data, it provides a snapshot of the trends and patterns of the underlying determinants and is indicative of the situation to expect during and beyond the pandemic.

FIGURE 1: Determinants of undernutrition



Source: Adapted from Black et al. (2008)

FIGURE 2. Trends in status of underlying determinants, in India, between 2006 and 2016



Source: NFHS-3 (2006) & NFHS-4 (2016).

Note: All women-level indicators were constructed using all women dataset; All other indicators were constructed using household dataset.

TABLE 1 Number of districts in different prevalence categories for each underlying determinant

Underlying determinants	Prevalence category (%)			
	0-24.9	25-49.9	50-74.9	>= 75
Number of districts				
Women married after the age of 18	0	33	264	343
Women with at least 10 years of education	197	352	85	6
Men with at least 10 years of education	45	387	201	7
Access to electricity	0	23	83	534
Access to improved drinking water facility	0	14	81	545
Use of improved sanitation facility	122	232	194	92
No open defecation	71	190	125	254

Indicator definitions

Women married after the age of 18: % of women between 20-24 years married after the age of 18.

Women with at least 10 years of schooling: % of women between 15-49 years with 10 or more years of school education.

Men with at least 10 years of schooling: % of men between 15-49 years with 10 or more years of school education.

Access to electricity: % of households with access to electricity.

Access to improved drinking water source: % of households with access to an improved drinking water source [improved, if the source of water is piped into dwelling, piped to yard/plot, public taps/ standpipe, protected well, protected spring, rainwater].

Use of improved sanitation facility: % of households using an improved sanitation facility

[Improved sanitation facility: Toilet facility has flush to piped sewer system, flush to septic tank, flush to pit latrine, ventilated improved pit (VIP)/biogas latrine, pit latrine with slab, twin pit/composting toilet, which is not shared with any other household].

No open defecation: % of households not defecating in open [could be using shared or unshared toilet facilities].

Codes for State and Union Territories

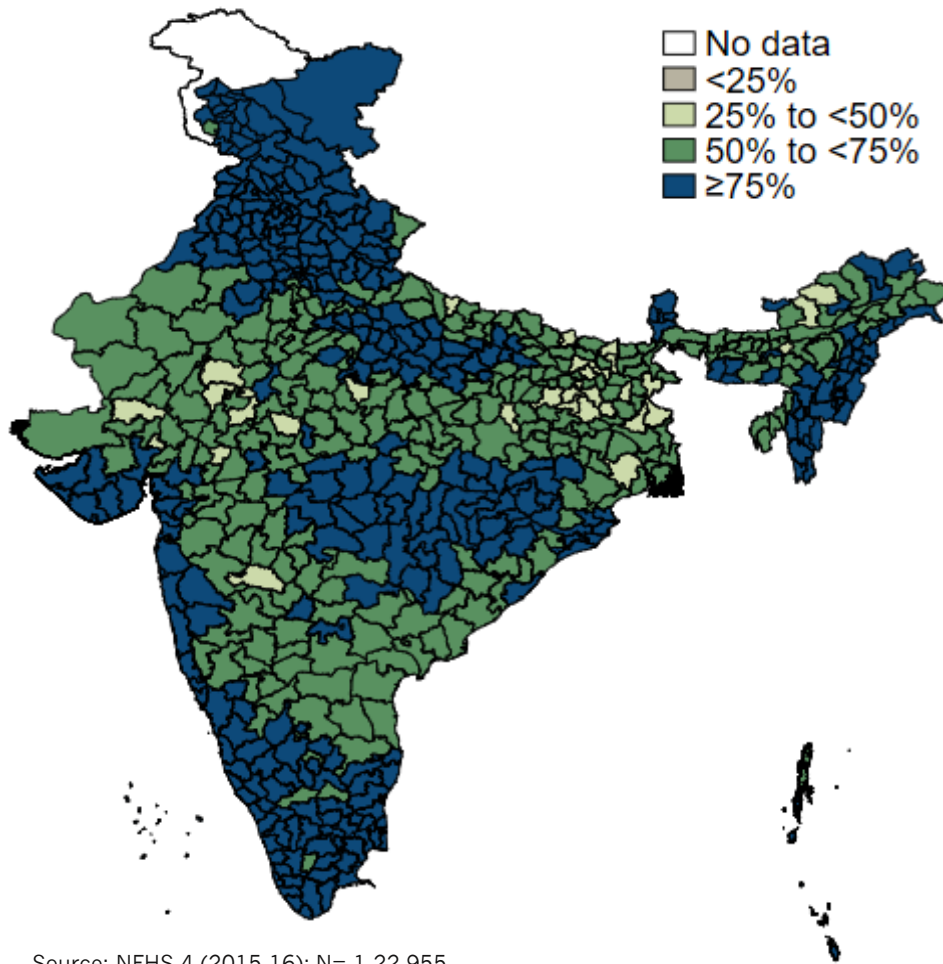
AN - Andaman & Nicobar Islands
 AP - Andhra Pradesh
 AR - Arunachal Pradesh
 AS - Assam
 BR - Bihar
 CH - Chandigarh
 CT - Chhattisgarh
 DN - Dadra & Nagar Haveli
 DD - Daman & Diu

DL - Delhi
 GA - Goa
 GJ - Gujarat
 HR - Haryana
 HP - Himachal Pradesh
 JK - Jammu & Kashmir
 JH - Jharkhand
 KA - Karnataka
 KL - Kerala

LD - Lakshadweep
 MP - Madhya Pradesh
 MH - Maharashtra
 MN - Manipur
 ML - Meghalaya
 MZ - Mizoram
 NL - Nagaland
 OR - Odisha
 PY - Puducherry

PB - Punjab
 RJ - Rajasthan
 SK - Sikkim
 TN - Tamil Nadu
 TG - Telangana
 TR - Tripura
 UT - Uttarakhand
 UP - Uttar Pradesh
 WB - West Bengal

MAP 1. Percentage of women (20-24 years old) married after the age of 18, by district, in 2016



No data
 <25%
 25% to <50%
 50% to <75%
 ≥75%

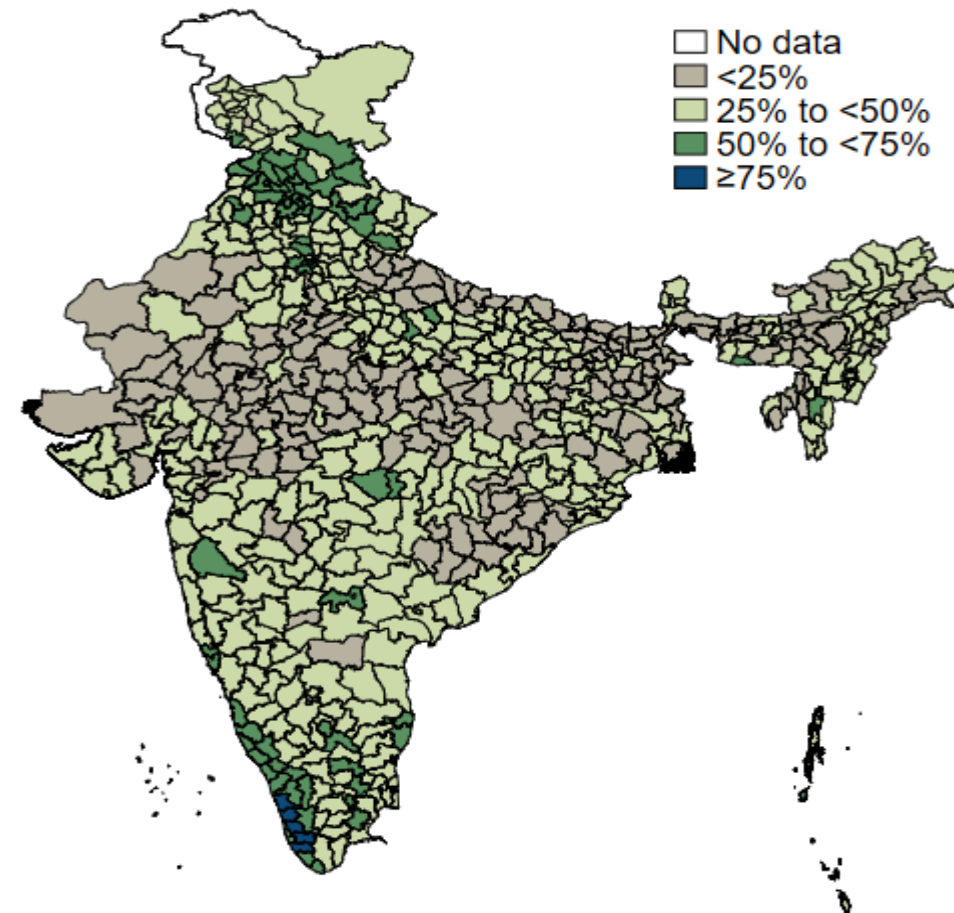
Top 5 districts, %	
Ernakulam (KL)	100
Pulwama (JK)	99.3
Pathanamthitta (KL)	98.8
Alappuzha (KL)	98.8
Kottayam(KL)	91.9

Bottom 5 districts, %	
Shrawasti (UP)	29.8
Godda (JH)	35.4
Supaul (BR)	39.2
Jamui (BR)	39.8
Garhwa (JH)	40.4

Source: NFHS-4 (2015-16); N= 1,22,955.

Note: This indicator is coded to highlight the positive practice of age-appropriate marriage, rather than the standard indicator of early marriage.

MAP 2. Percentage of women (15-49 years old) with at least 10 years schooling, by district, in 2016



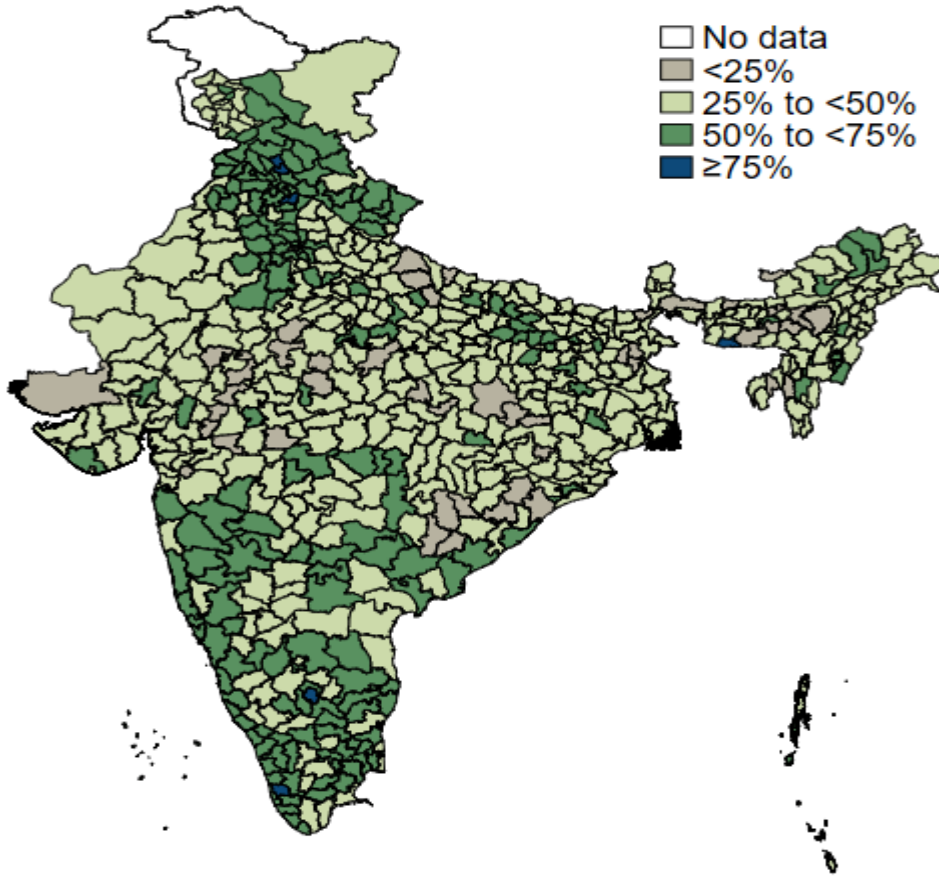
No data
 <25%
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 50% to <75%
 ≥75%

Top 5 districts, %	
Mahe (PY)	86.3
Ernakulam (KL)	82.9
Kottayam (KL)	81.4
Kollam (KL)	79.1
Pathanamthitta (KL)	76.8

Bottom 5 districts, %	
Jaisalmer (RJ)	9.0
Jhabua (MP)	9.2
Shrawasti (UP)	9.3
Alirajpur (MP)	9.6
Barmer (RJ)	10.2

Source: NFHS-4 (2015-16).

MAP 3. Percentage of men (15-49 years old years) with at least 10 years schooling, by district, in 2016



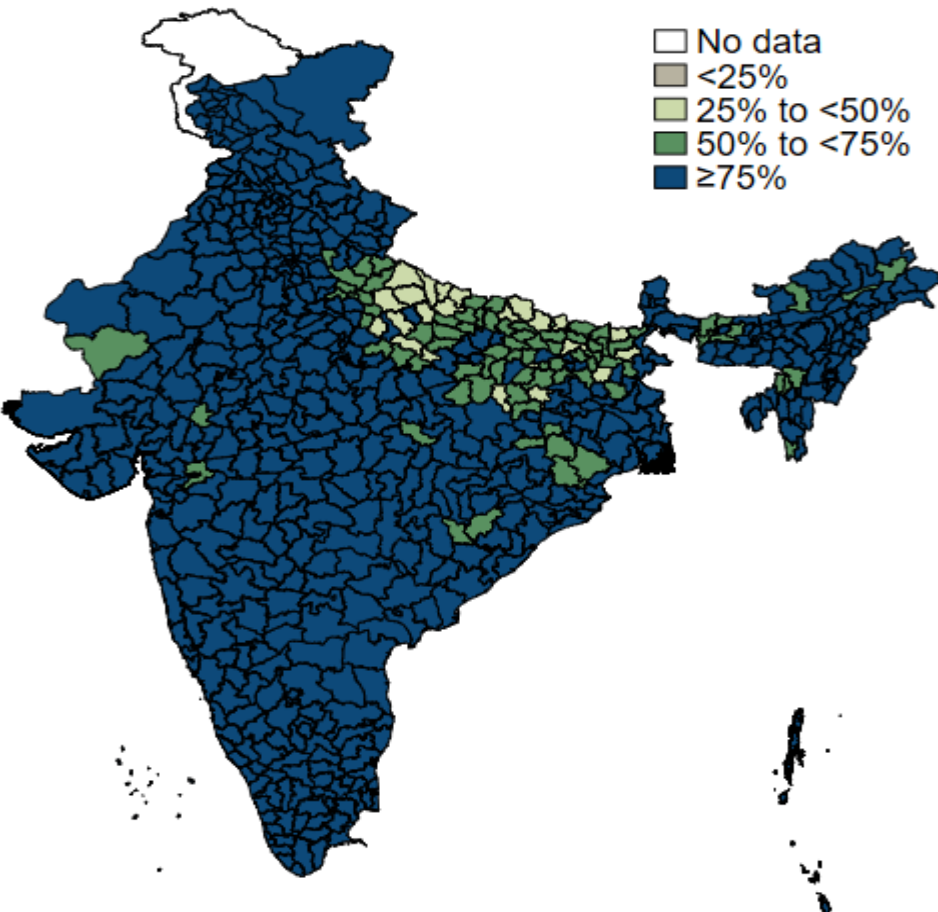
No data
 <25%
 25% to <50%
 50% to <75%
 ≥75%

Top 5 districts, %	
Chennai (TN)	88.3
Bilaspur (HP)	80.0
Kottayam (KL)	78.0
Ambala (HR)	76.6
Hamirpur (HP)	76.5

Bottom 5 districts, %	
Ri Bhoi (ML)	12.6
Umariya (MP)	14.8
Shrawasti (UP)	14.8
Pakur (JH)	15.3
Sahibganj (JH)	15.5

Source: NFHS-4 (2015-16).

MAP 4. Percentage of households with electricity, by district, in 2016.



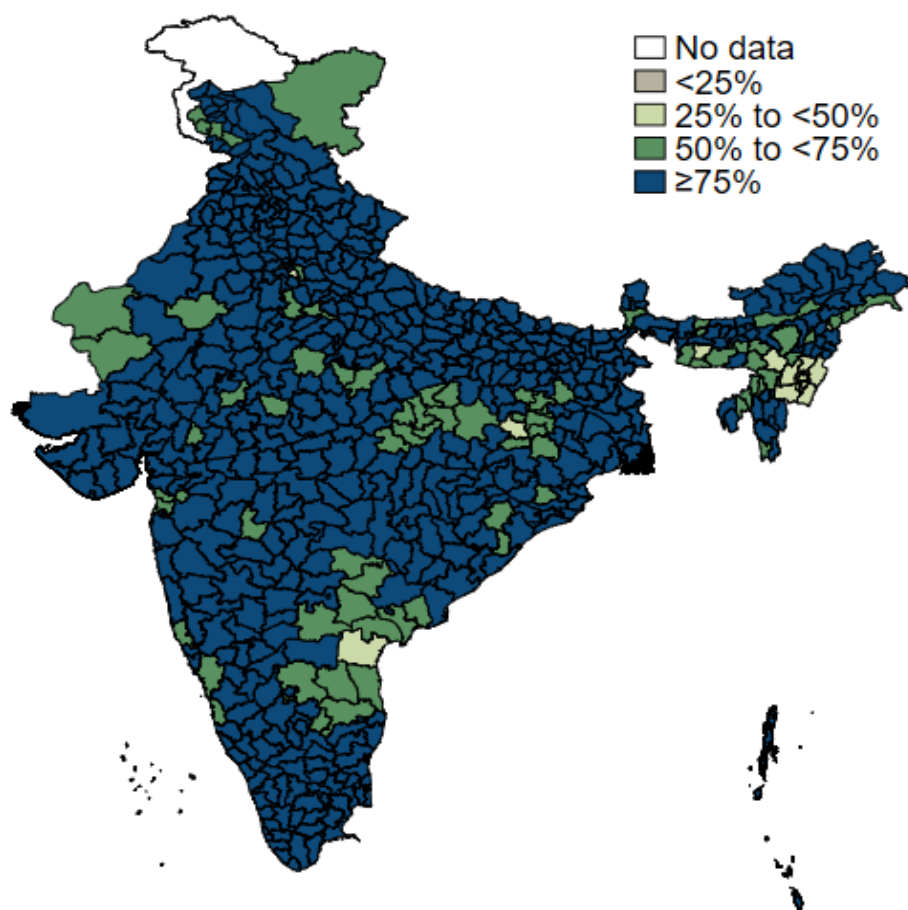
No data
 <25%
 25% to <50%
 50% to <75%
 ≥75%

Top 5 districts, %	
8 districts with 100% households with electricity	
West Delhi (DL), Kangra (HP), South Goa (GA), Daman (DD), North East Delhi (DL), Hyderabad (TG), Rupnagar (PB), Panipat (HR)	

Bottom 5 districts, %	
Shrawasti (UP)	25.6
Sitapur (UP)	29.9
Bahraich (UP)	31.3
Katihar (BR)	31.6
Balrampur (UP)	35.7

Source: NFHS-4 (2015-16).

MAP 5. Percentage of households with an improved drinking water source, by district, in 2016.

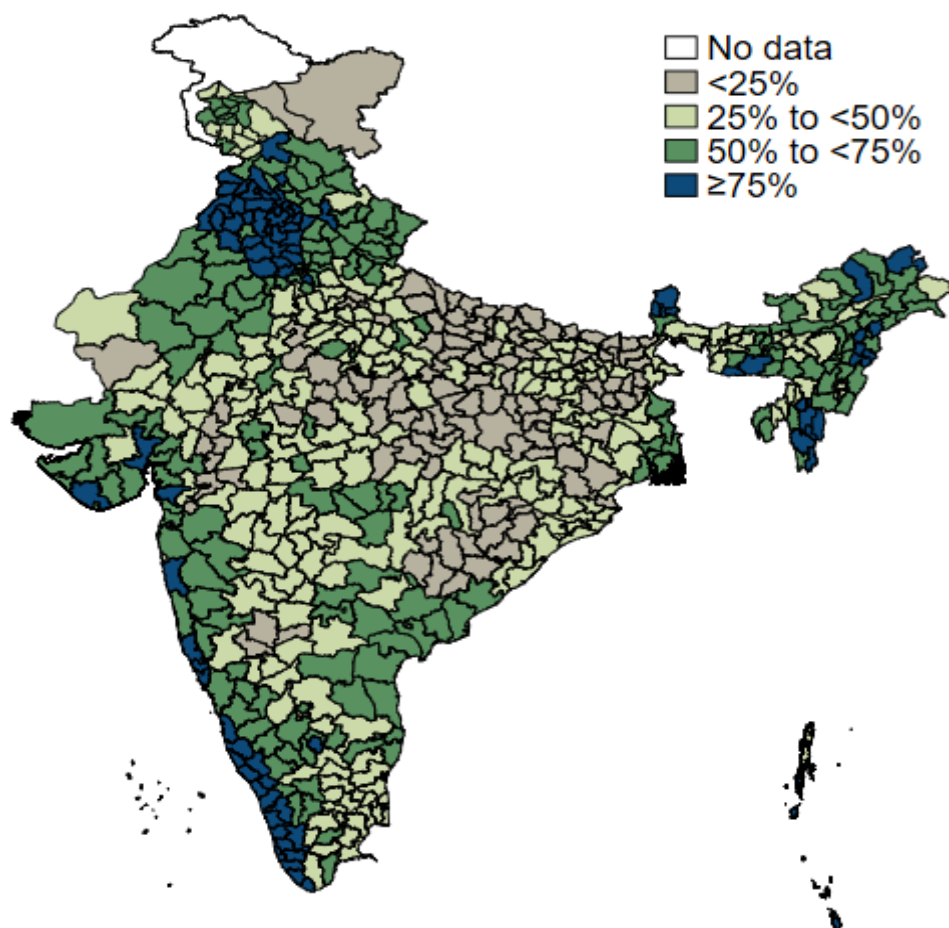


Source: NFHS-4 (2015-16).

Top 5 districts, %	
Karnal (HR)	100
Budaun (UP)	100
Sitamarhi (BR)	100
Bijnor (UP)	100
Bhojpur (BR)	100

Bottom 5 districts, %	
Imphal East (MN)	31.8
Thoubal (MN)	33.5
Senapati (MN)	35.3
Chandel (MN)	37.3
Tamenglong (MN)	37.6

MAP 6. Percentage of households using improved sanitation facilities by district, in 2016.

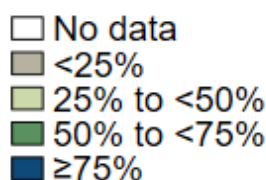
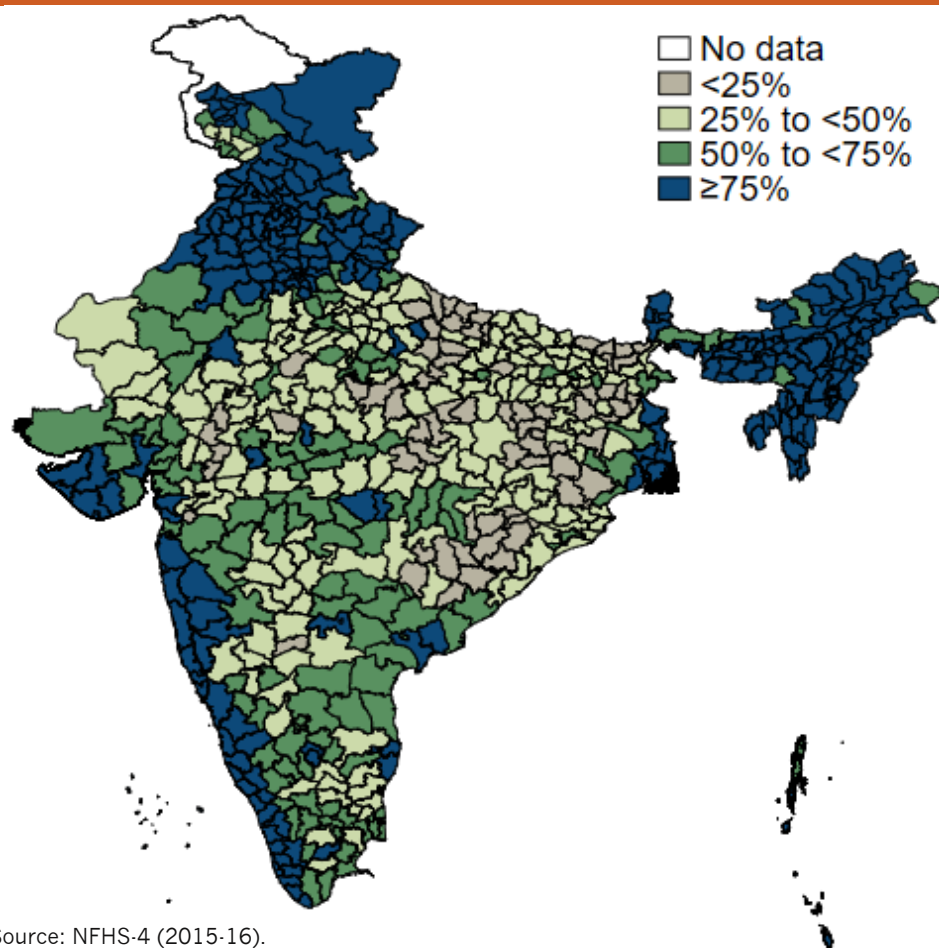


Source: NFHS-4 (2015-16).

Top 5 districts, %	
Thrissur (KL)	99.5
Kozhikode (KL)	99.4
Ernakulam (KL)	99.3
Lakshadweep (LD)	99.2
Kottayam (KL)	98.9

Bottom 5 districts, %	
Dindori (MP)	6.9
Simdega (JH)	8.5
Sidhi (MP)	10.0
Shrawasti (UP)	10.4
Garhwa (JH)	10.8

MAP 7. Percentage of households reporting no open defecation, by district, in 2016.



Top districts, %

6 districts with 100% of households reporting no open defecation

Aizawl (MZ), Mokokchung (NL), Lakshadweep (LD), Srinagar (JK), South Garo Hills (ML) and West Delhi (DL)

Bottom 5 districts, %

Dindori (MP)	10.1
Simdega (JH)	10.8
Sidhi (MP)	12.6
Garhwa (JH)	13.2
Shrawasti (UP)	13.3

Source: NFHS-4 (2015-16).

Key findings

Women married after the age of 18 years: Between 2006 and 2016, the proportion of women married after the age of 18 years increased significantly (56 percent to 73 percent) (Fig. 2). In 2016, in 607 out of 640 districts, more than 50 percent women between 20-24 years were married after the age of 18 years. However, in a few districts in Uttar Pradesh, Bihar and Jharkhand, the proportion of women being married after the age of 18 years was very low (between 30 percent and 40 percent) (Map 1).

Women with at least 10 years of schooling: Between 2006 and 2016, the proportion of women with at least 10 years of schooling increased from 22 percent to 36 percent (Fig. 2). In 2016, in nearly 86 percent districts of India (549 out of 640 districts), less than 50 percent of women had at least 10 years of schooling. In Madhya Pradesh (39 districts), Rajasthan (23 districts), Bihar (22 districts) and Assam (15 districts) this proportion was less than 25 percent. Of the five districts with the highest proportion of women with at least 10 years of schooling (above 75 percent), four were in Kerala.

Men with at least 10 years of schooling: Between 2006 and 2016, the proportion of men with at least 10 years of schooling increased from 34 percent to 46 percent (Fig. 2). In 2016, in nearly 68 percent districts of India (432 out of 640 districts), less than 50 percent of men had at least 10 years of schooling. In a few districts, in Meghalaya, Jharkhand and Uttar Pradesh, this proportion was as low as 15 percent or less (Map 3).

Access to electricity: Between 2006 and 2016, proportion of households with access to electricity increased from 67 percent to 88 percent (Fig. 2). In 2016, in only 8 districts across India all the households had access to electricity. In 534 districts, more than 75 percent households had access to electricity. Of the five districts with the lowest proportion of households with access to electricity (below 40 percent) four were in Uttar Pradesh (Map 4).

Access to an improved drinking water source: The overall proportion of households with access to an improved source of drinking water was high at 87.6 percent in 2006, and further increased to 89.4 percent in 2016 (Fig. 2). In 2016, in 545 out of 640 districts, more than 75 percent of households had access to an improved drinking water source. In Madhya Pradesh (12 districts), Jharkhand (9 districts) and Assam (9 districts), between 50 percent and 75 percent of households had access to an improved drinking water source. All the five districts with the lowest proportion of households with access to an improved drinking water source (below 40 percent), were in Manipur (Map 5).

Use of an improved sanitation facility: Between 2006 and 2016, use of an improved sanitation facility increased from 29 percent to 48 percent (Fig. 2). However, the national average in 2016 was still below 50 percent. In nearly 55 percent districts of India (354 out of 640 districts), less than 50 percent of the households used an improved sanitation facility, in 2016. In Uttar Pradesh (31 districts), Madhya Pradesh (22 districts) and Bihar (18 districts), less than 25 percent of households using an improved sanitation facility. Of the five districts with the highest proportion of households using an improved sanitation facility, four were in Kerala (Map 6).

No open defecation: Between 2006 and 2016, the proportion of households reporting no open defecation increased from 44 percent to 61 percent (Fig. 2). In 2016, there were 6 districts across India where 100 percent households reported no open defecation. However, in nearly 41 percent districts of India (261 out of 640 districts), only less than 50 percent households reported no open defecation (Map 7).

Recommendations

Addressing the root underlying causes of undernutrition is critical to improve child undernutrition in India. Particularly in the context of COVID-19 and its aftermath, there is a grave danger of backsliding on these underlying determinants as the focus turns to basic human preservation. Therefore, it is important that these determinants receive their due attention.

Education

Returns on nutritional status generally increase with higher education (Alderman & Headey, 2017). In India, the Right of Children to Free and Compulsory Education Act, 2009, is in place to provide free and compulsory education for all children in the 6-14 years age group. The Rashtriya Madhyamik Shiksha Abhiyan, a flagship scheme focuses on enhancing access to secondary education and improve its quality. Despite these provisions, it is a matter of grave concern that overall, the proportion of women and men in India with at least ten years of schooling was less than 50 percent in 2016. In the current context of COVID-19, when schools are being closed and education is moving toward digital platforms, there is a heightened risk that poorer children will be left behind. Hence, there is an urgent need to ensure that the solutions and adaptations are inclusive for all. It is imperative to ensure that the digital divide does not widen the education gap among different social and geographical strata.

Age at marriage

Evidence shows that children born to adolescent mothers are more likely to be undernourished than those born to adult mothers (Nguyen et al., 2019). Despite the legal mandate for minimum age at marriage, even in 2016 almost 1 in 4 women were married before the age of 18. Interventions are needed to support delayed marriage and first childbirth to ensure improved maternal and child nutrition. There is a need for:

- Interventions to support education for girls and livelihoods for women, including unconditional cash transfers, cash transfers conditional on school enrolment or attendance, school vouchers, life-skills curriculum and livelihood training.
- Interventions to address other reasons for early marriage, including addressing safety and security for girls and young women, implementing existing legal acts related to dowry and early marriage and mobilizing a wide range of stakeholders, including the youth.

While it is not known how the girls' age at marriage will be affected in the context of COVID-19 pandemic, it is important not to lose focus on it, given its crucial link to undernutrition.

Water, hygiene and sanitation

It is well documented that access to improved sanitation is important for child growth (Corsi et al., 2016; Menon et al., 2018). Under Government of India's Swachh Bharat Mission, efforts are underway to ensure open-defecation free villages. As per the National Annual Rural Sanitation Survey 2017-18, 77 percent of households in India were found to have access to toilets. In 2019, 95 percent of districts (709 out of 739 districts) in India were declared Open Defecation Free (Department of Drinking Water & Sanitation, 2019). While measures need to be taken to ensure that households are using an improved sanitation facility across all states, the following considerations are important:

- Construction of improved sanitation facilities must be accompanied with behavior change communication to ensure their usage.
- Provision of sanitation facilities should be coupled with ensuring adequate water resources for maintaining the hygiene and sanitation of such facilities.

The social movements related to hygiene in the context of COVID-19 could be leveraged on to further behavior change for improved sanitation to support nutrition and other health outcomes.

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ABOUT POSHAN

Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (POSHAN) is a multi-year initiative that aims to support the use of data and evidence in decision-making for nutrition in India. To strengthen these efforts, POSHAN works with several partners including government, academia, civil society, development partners and the media. It is supported by the Bill & Melinda Gates Foundation and led by IFPRI in India.

ABOUT DATA NOTES

POSHAN Data Notes focus on data visualization to highlight geographic and/or thematic issues related to nutrition in India. They draw on multiple sources of publically available data.

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