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Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India
Policy Note
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Improving Nutrition in Arunachal Pradesh

Insights from Examining Trends in Outcomes, Determinants and Interventions between 2006 and 2016

INTRODUCTION

India has made considerable progress on child nutrition outcomes in the last decade. These rates of improvement, however, have been highly variable across the states, mostly due to variability in state-level changes in the determinants of nutrition and in the coverage of health and nutrition interventions. Although all of the states operate under a similar national policy and programmatic environment, the variability in trends in nutritional outcomes points to state-specific factors. An understanding of such factors can facilitate both state-specific learning and cross-state learning, and assist in identifying strategies to help India accelerate progress in nutrition. In a series of *Policy Notes*, we examine state-specific trends in nutrition outcomes, determinants and the coverage of interventions, with the overall goal of supporting the state. This *Policy Note* focuses on Arunachal Pradesh.

Arunachal Pradesh, situated in the north-east of India, accounts for 2.5 percent of the area of the country and includes 21 districts (Government of Arunachal Pradesh 2017). The state is home to more than 1 million people (0.08 percent of the population of India) of which 65.4 percent is literate (Census of India 2011). Arunachal Pradesh has a sex ratio of 938 females per 1,000 males (Census of India 2011). The state is largely forested and is known to be the richest bio-geographical province of the Himalayan zone (Government of Arunachal Pradesh 2017).

The purpose of this *Policy Note* is to examine the trends in undernutrition in Arunachal Pradesh and to document trends and geographic variability in the major determinants of nutrition and the coverage of key nutrition and health interventions. In doing this analysis, we aim to highlight the key areas of action to improve nutrition in Arunachal Pradesh.

METHODS

We used summary data from the recently released National Family Health Survey-4 (NFHS-4 2015–16) fact sheets (International Institute for Population Sciences 2017) and data from NFHS-3 from 2005–06 to compare trends in outcomes, determinants and interventions over a decade (International Institute for Population Sciences 2008). We also used information from fact sheets of the Rapid Survey on Children (RSoC 2013–14) (Ministry of Women and Child Development 2015) for indicators that are currently not available in NFHS-4 fact sheets. We used summary data reported in the NFHS-4 district-level fact sheets to examine inter-district variability. Since NFHS-4 used the Census 2011 district boundaries, this Policy Note reports information for only 16 districts.

For outcome indicators, we examined progress on a set of global nutrition targets for maternal, infant and young child nutrition (WHO 2014). These include stunting, wasting, low birth weight, exclusive breastfeeding, and anemia status among women of reproductive age.

We also examined levels and changes in several immediate, underlying and basic determinants of nutrition (Black et al. 2013). For intervention coverage, we chose to examine a set of nutrition-specific interventions across the lifecycle for which data are currently available. These include interventions affecting pregnant women, newborn babies, infants, and children.

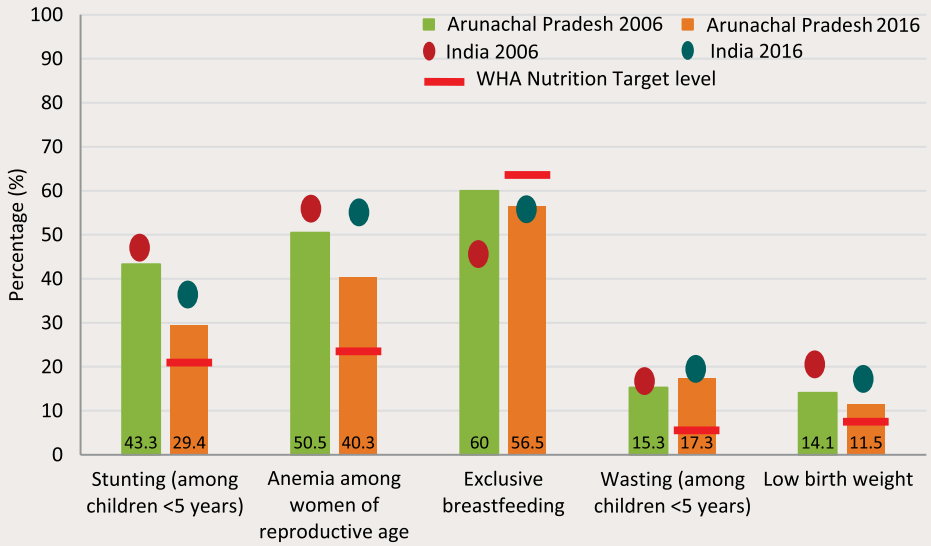
FINDINGS

Trends in nutrition outcomes and variability in outcomes by district

Overall, changes in nutrition outcomes in Arunachal Pradesh between 2006 and 2016 have been mixed. While stunting prevalence fell substantially from 43.3 to 29.4 percent (Figure 1), wasting increased slightly from 15.3 to 17.3 percent. Anemia among women of reproductive age reduced from 50.5 percent to 40.3 percent in the last ten years. The prevalence of low birth weight decreased by 2.6 percentage points, from 14.1 to 11.5 percent. The prevalence of exclusive breastfeeding showed a reverse trend, decreasing from 60 to 56.5 percent. The state, however, performed better than the national average on all the indicators.

Stunting among children less than five years varied moderately among districts, ranging from 20.5 percent in Tawang to 42 percent in East Kameng (Map 1). Stunting is high (30-40 percent) in 5 other districts (West Siang, Lower Subansiri, Dibang Valley, Kurung Kumey, Tirap). Anemia among women has the lowest prevalence (22.9 percent) in Dibang Valley and the highest (55 percent) in Lohit. Only in 4 of the 16 districts, prevalence of anemia among women is high (40-60 percent) (Map 2). Wasting ranges from 7.2 percent (West Kameng) to 29.4 percent (Upper Siang) (Map 3). The prevalence of wasting is very high (≥15 percent) in 12 out of 16 districts. Severe wasting ranges from 2.8 percent (Papum Pare) to 15.9 percent (Upper Siang) and more than 10 percent of children below five years are severely wasted in 7 districts (Map 4). Exclusive breastfeeding (EBF) rates are missing for 9 districts. Among the remaining 7 districts, EBF varies widely and is the lowest in East Kameng (21.7) and the highest in Lower Dibang Valley (74.1 percent) (Map 5).

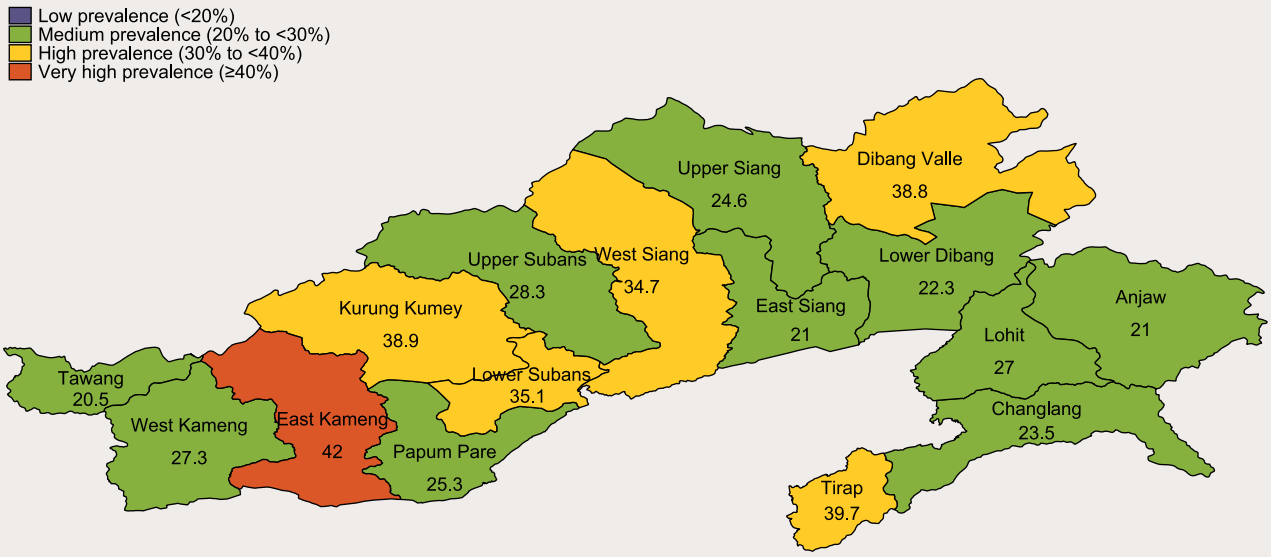
FIGURE 1 Trends in key nutrition outcomes in Arunachal Pradesh, 2006 to 2016



Source: NFHS-3 and NFHS-4; RSoC for low birth weight.

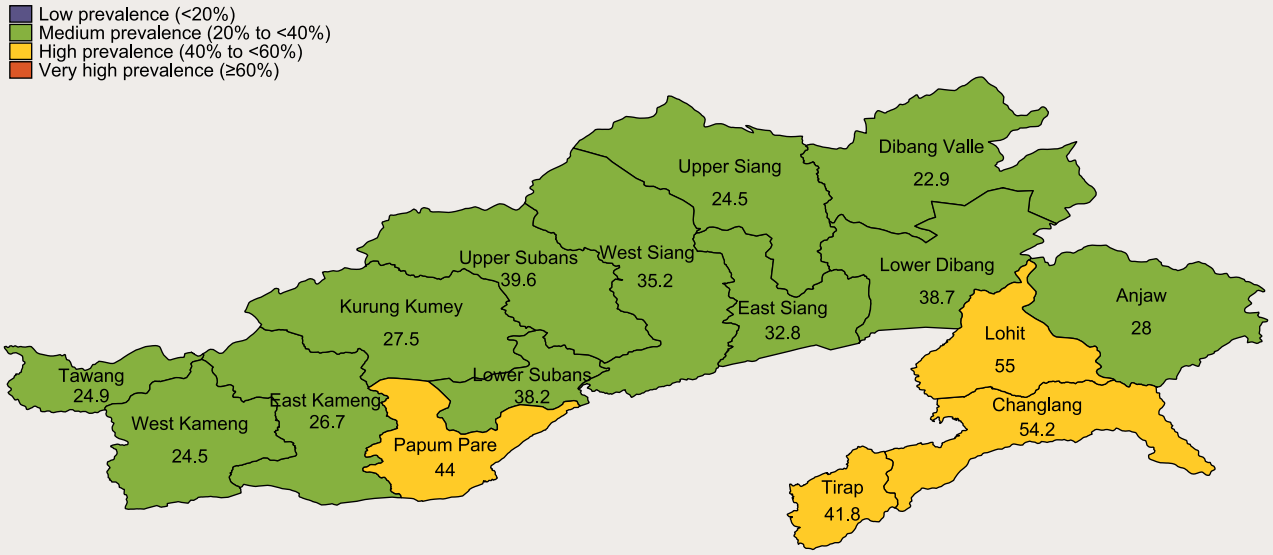
Note: A set of global nutrition targets for maternal, infant and young child nutrition were endorsed by the World Health Assembly (WHA) in 2012. The red lines represent the WHA targets to be achieved by the state, by 2025. The baseline reference year for these targets is 2012. The state baseline estimates are based on NFHS-4 (2016) as there is no survey data for 2012. Child overweight data is not available. Refer to endnotes for indicator definitions.

MAP 1 Stunting (among children < 5 years) in Arunachal Pradesh in 2016, by district



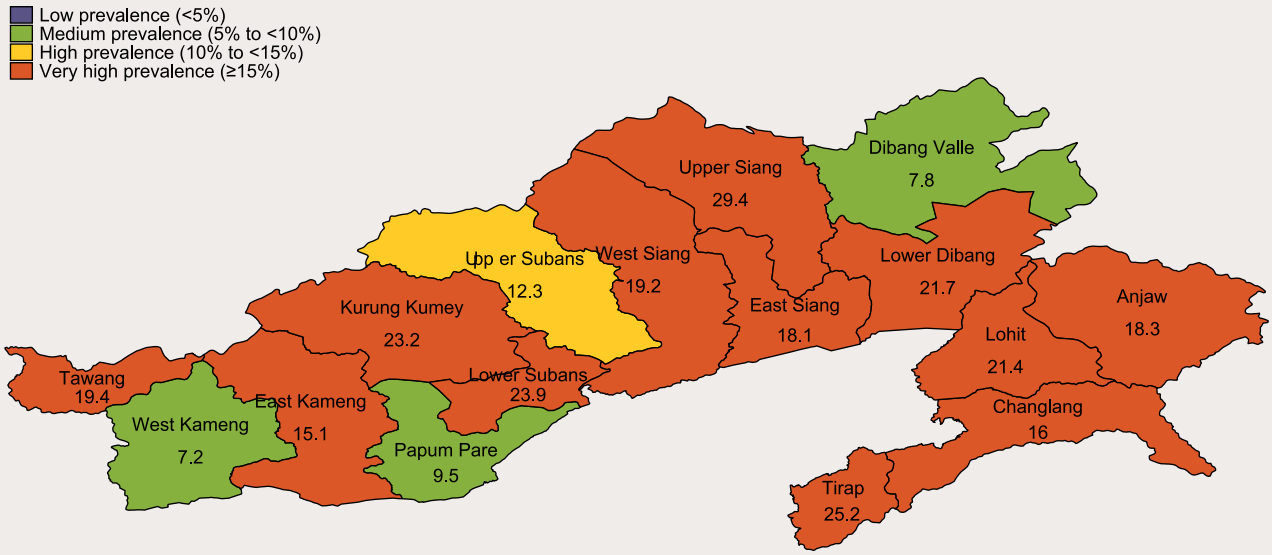
Source: NFHS-4.

MAP 2 Anemia among women of reproductive age in Arunachal Pradesh in 2016, by district



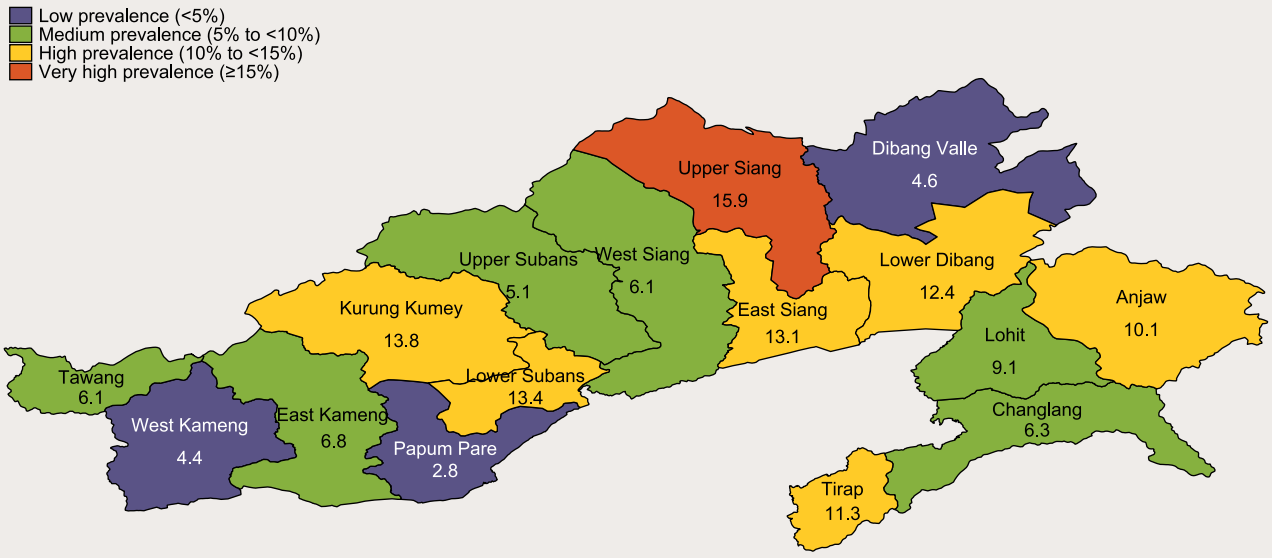
Source: NFHS-4.

MAP 3 Wasting (among children < 5 years) in Arunachal Pradesh in 2016, by district



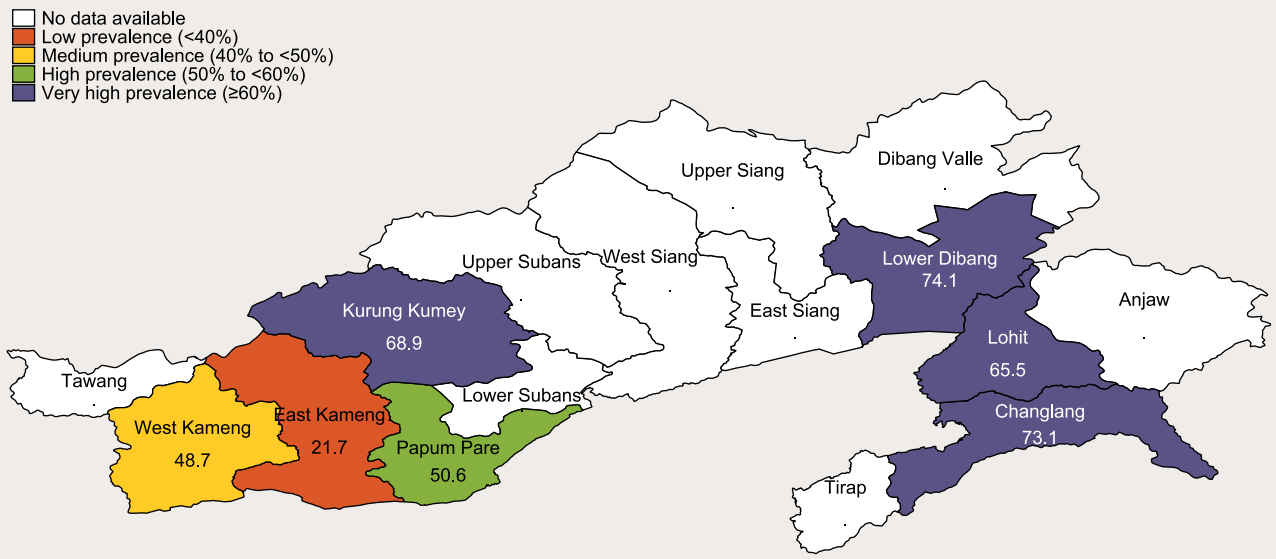
Source: NFHS-4.

MAP 4 Severe wasting (among children < 5 years) in Arunachal Pradesh in 2016, by district



Source: NFHS-4.

MAP 5 Exclusive breastfeeding in Arunachal Pradesh in 2016, by district



Source: NFHS-4.

Changes in the determinants of nutrition

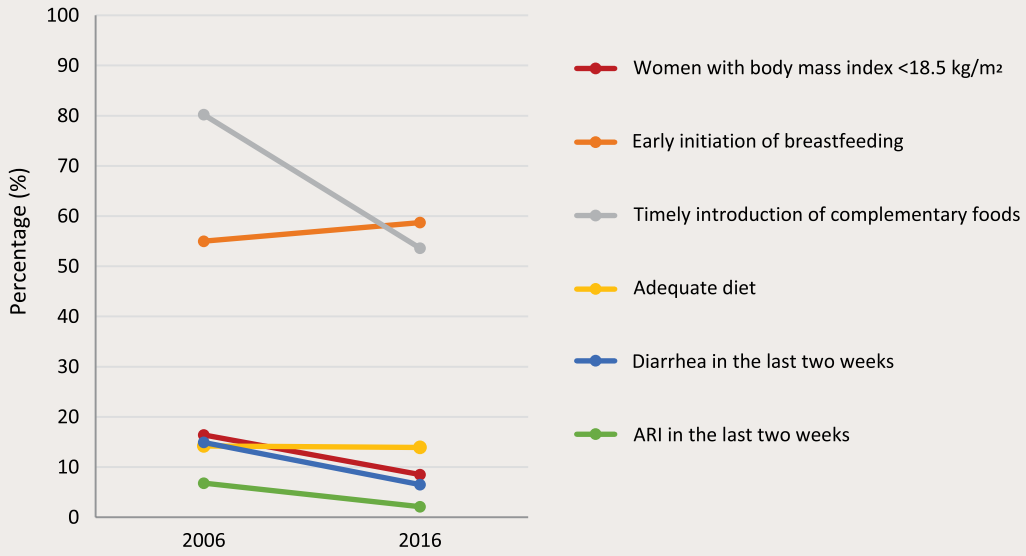
Improving nutrition for women and children requires that investments be made in changing the determinants of poor nutrition, using a variety of policy instruments and other efforts. Here, we examine changes in the immediate determinants and in nutrition-specific interventions to address those determinants. We also describe changes in the underlying determinants of nutrition. We do not examine coverage data on programs to improve the underlying determinants in this Note because data on those are not available at this time.

Changes in the ***immediate determinants*** of nutrition in Arunachal Pradesh are described in Figure 2. The proportion of women with low body mass index (BMI <18.5 kg/m^2) nearly halved from 2006 to 2016 (from 16.4 percent to 8.5 percent). Early initiation of breastfeeding improved only slightly from 55 percent to 58.7 percent; over 40 percent of children are still not breastfed within an hour of birth. Child morbidity declined considerably in the last ten years, with diarrhea prevalence falling from 14.9 percent to 6.5 percent and the prevalence of acute respiratory infection (ARI) falling from 6.8 percent to 2.1 percent.

Complementary feeding is still far from adequate in Arunachal Pradesh, as it is for India. Timely introduction of complementary foods (between 6 and 8 months of age) declined considerably over the last decade (from 80.2 percent to 53.6 percent). In 2016, only 13.9 percent of children (between 6 and 23 months of age) received an adequate diet.

The coverage of all ***nutrition-specific interventions*** in Arunachal Pradesh improved during the last decade (Figure 3). During pregnancy, the proportion of women who received antenatal care (ANC) during the first trimester improved by 12.8 percentage points, from 24.2 percent in 2006 to 37 percent in 2016. The proportion of women who received at least 4 ANC visits, however, increased only slightly, from 22.4 percent to 26.8 percent. Iron and folic acid (IFA) consumption during pregnancy improved only marginally, from 7.3 percent to 8.3 percent. Over 90 percent of pregnant women still do not consume IFA. Interventions related to delivery, such as institutional deliveries, births assisted by health professionals and birth registration, improved between 24 to 31 percentage points, reaching between 52 and 63 percent in 2016. The coverage

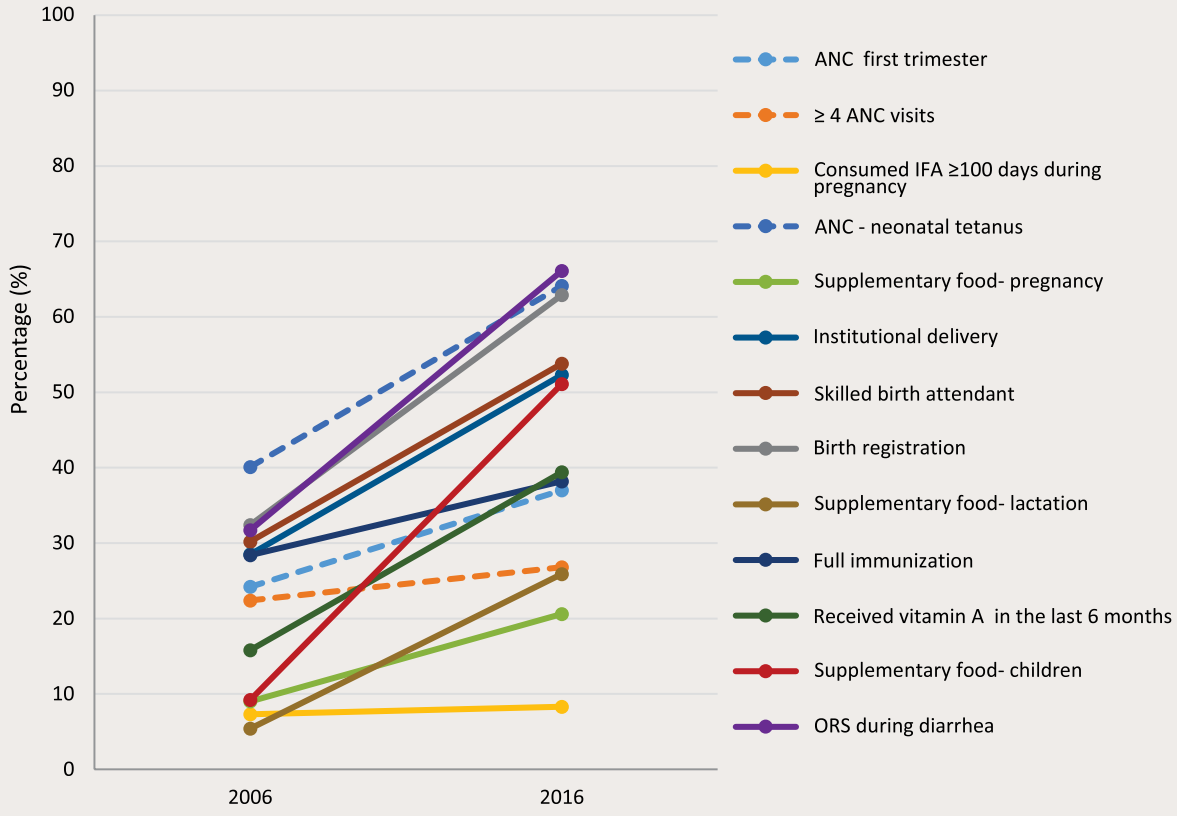
FIGURE 2 Changes in immediate determinants of nutrition in Arunachal Pradesh, 2006 to 2016



Source: NFHS-3 and NFHS-4.

Note: ARI = Acute respiratory infection; Refer to endnotes for indicator definitions.

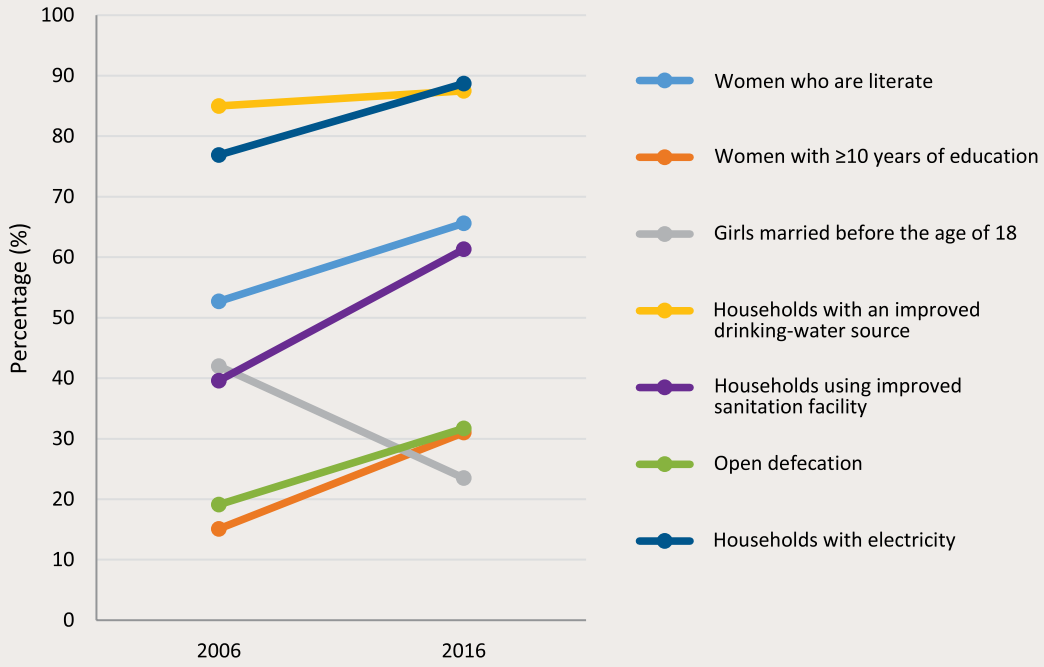
FIGURE 3 Changes in coverage of nutrition-specific interventions along the continuum of care in Arunachal Pradesh, 2006 to 2016



Source: NFHS-3 and NFHS-4; RSoC data used for food supplementation.

Note: ANC= Antenatal care; IFA= Iron and folic acid; ORS = Oral rehydration salts; Refer to endnotes for indicator definitions.

FIGURE 4 Changes in underlying determinants of nutrition in Arunachal Pradesh, 2006 to 2016



Source: NFHS-3 and NFHS-4; RSoC data used for open defecation indicator.

Note: Bars represent state averages; Refer to endnotes for indicator definitions.

of food supplementation inceased among all the beneficiaries between 2006 and 2016, from 9 percent to 20.6 percent for pregnant women, 5.4 percent to 25.9 percent for lactating women, and 9.2 percent to 51.1 percent for children. Nutrition interventions focused on children have improved in the last ten years. The proportion of children receiving vitamin A supplementation more than doubled (from 15.8 percent to 39.4 percent). Similarly, children with diarrhea who received ORS increased considerably from 31.7 percent to 66.1 percent. The proportion of children who were fully immunized increased from 28.4 percent to 38.2 percent. However, nearly two thirds of the children still do not receive full immunization in the state.

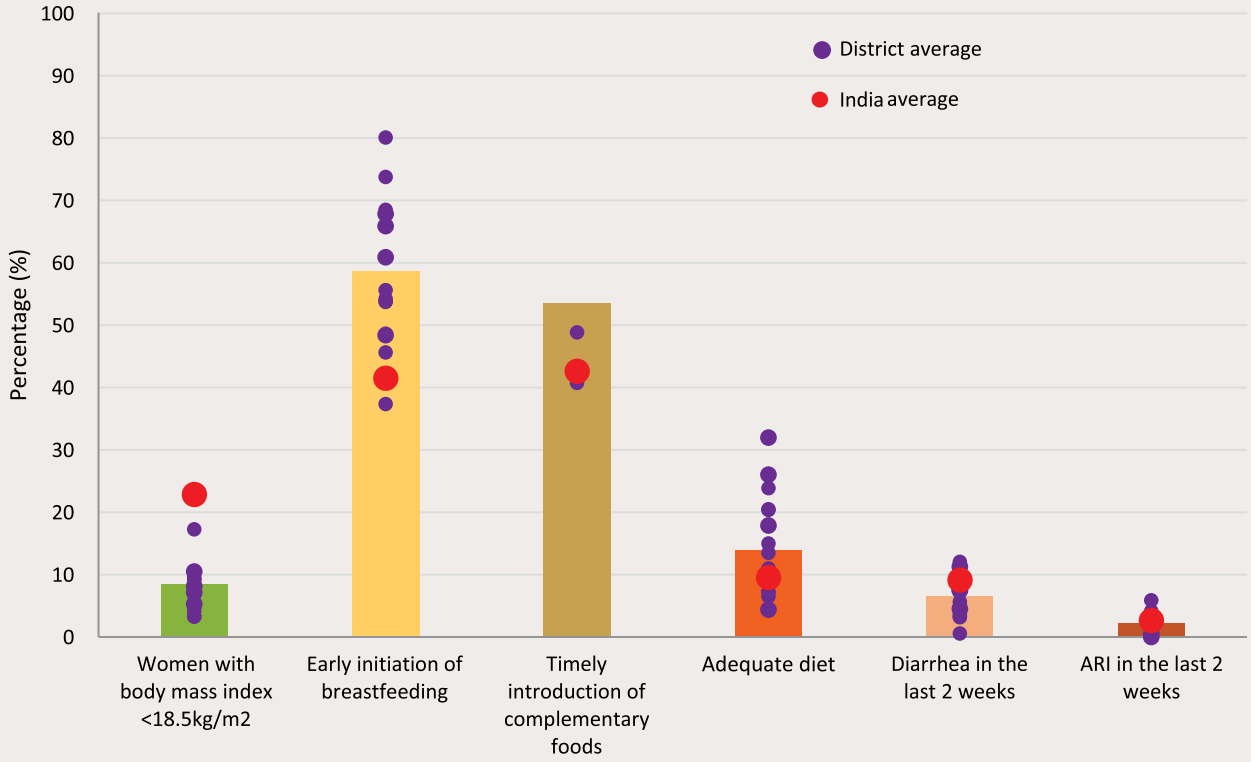
Changes in the ***underlying determinants*** of nutrition are presented in Figure 4. Between 2006 and 2016 there has been an increase in the proportion of women who are literate (from 52.7 percent to 65.6 percent) and the proportion of women with more than 10 years of education (from 15.1 percent to 31 percent). Early marriage in girls declined considerably from 42 percent to 23.5 percent.

The state demonstrated improvements in infrastructure. Households with an improved drinking-water source increased slightly from 85 percent in 2006 to 87.5 percent in 2016, and households with electricity increased from 76.9 percent to 88.7 percent. Households using an improved sanitation facility increased considerably from 39.6 percent to 61.3 percent during this period. However, there has been a considerable increase in open defecation in the state, from 19.1 percent to 31.7 percent (RSoC 2013–14).

Inter-district variability in selected determinants and coverage of interventions in Arunachal Pradesh, in 2016

The 16 districts of Arunachal Pradesh for which NFHS-4 data is available cover a range of socio-economic characteristics. Among these districts there is a high degree of inter-district variability for most of the immediate and underlying determinants as well as for the coverage of interventions (Figures 5-7). There is limited inter-district variability for low body mass index in women and IFA consumption during pregnancy, which is mostly low across the districts. On some indicators such as low body mass index in women, early initiation of breastfeeding, adequate diet in children, ORS and Zinc consumption during diarrhea and access to sanitation, most districts of Arunachal Pradesh perform better than the national average. On a few other indicators such as women's

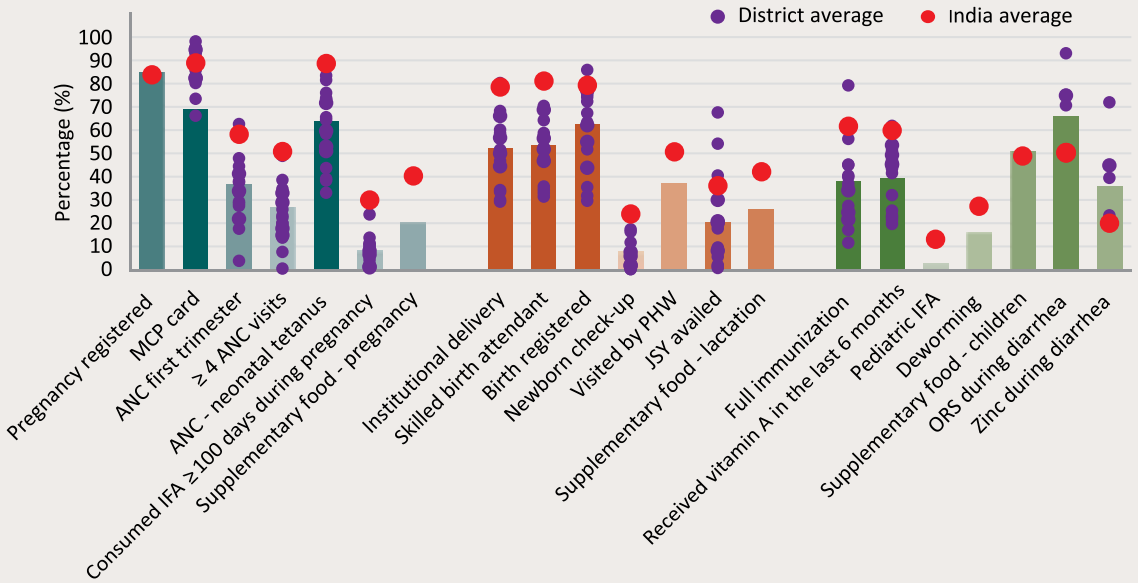
FIGURE 5 Inter-district variability in immediate determinants in Arunachal Pradesh, in 2016



Source: NFHS-4.

Note: Bars represent state averages; ARI= Acute respiratory infection; Refer to endnotes for indicator definitions.

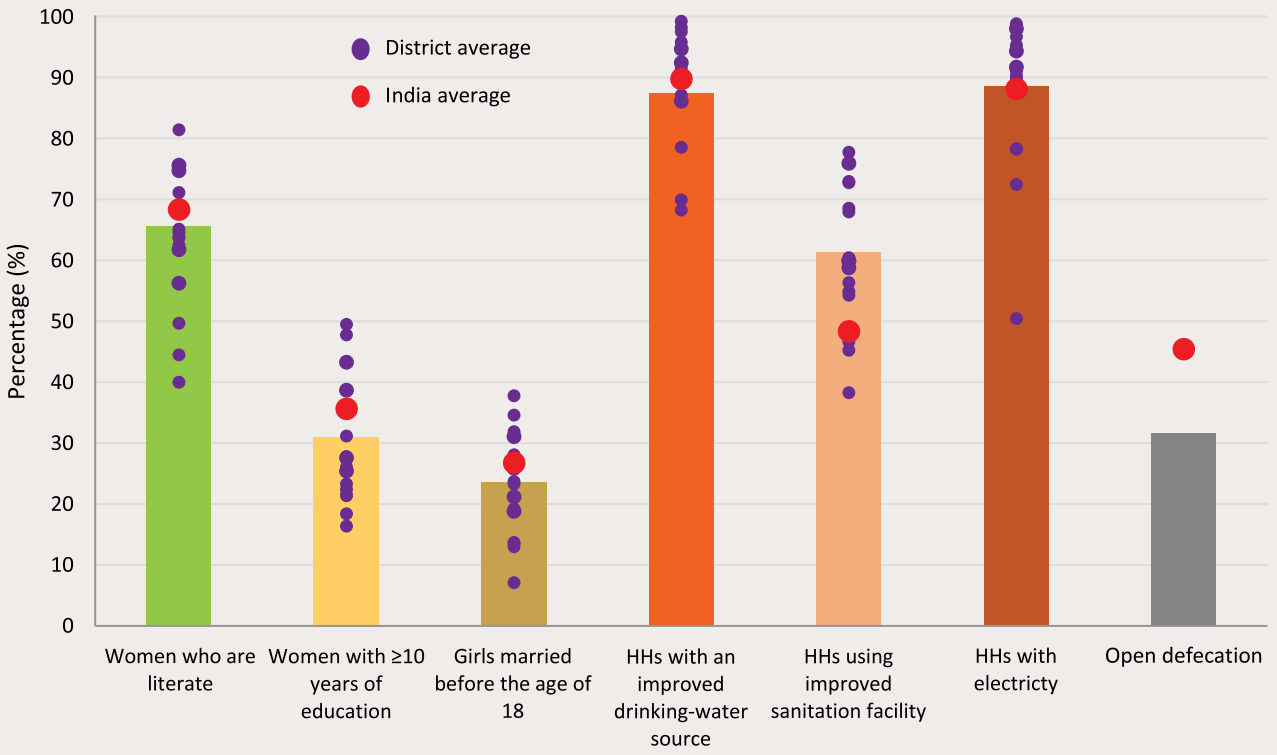
FIGURE 6 Inter-district variability in coverage of selected interventions in Arunachal Pradesh, in 2016



Source: NFHS-4; RSoC data was used for indicators on pregnancy registration, food supplementation during pregnancy, lactation and for children, visits by health worker, pediatric IFA and deworming for children.

Note: Bars represent state averages; As RSoC data is not representative at the district-level, district variablity is unavailable for these indicators; ANC= Antenatal care; IFA= Iron and folic acid; JSY= Janani Suraksha Yojana; ORS= Oral rehydration sals; MCP= Mother and child protection; PHW= Primary health worker; Refer to endnotes for indicator definitions.

FIGURE 7 Inter-district variability in underlying determinants in Arunachal Pradesh, in 2016



Source: NFHS-4; RSoC data is used for indicator for open defecation.

Note: Bars represent state averages; HHs= Households; Refer to endnotes for indicator definitions.

literacy, women's education and household access to drinking water and electricity, the coverage in most of the districts is nearly close to the national average. On the rest of the indicators such as ANC, and postnatal and early childhood related interventions; most districts in Arunachal Pradesh are doing worse than the national average.

LOOKING FORWARD: IMPLICATIONS & RECOMMENDATIONS

In the era where India has now embraced the sustainable development goals, it is an opportune time for Arunachal Pradesh to set its own nutrition targets to be achieved by 2025 and to set in motion accelerated actions for improved nutrition. In the last ten years, the state has made progress in the reduction of stunting, anemia among women and low birth weight. However, wasting has actually shown a reverse trend in the last ten years and is currently very high (≥15 percent) in more than half of districts in the state. The improvements is nutrition outcomes, other than wasting, can be attributed to some improvements seen in the coverage of nutrition-specific interventions. Mostly it looks like the improvements in underlying determinants of nutrition such as girls education, early marriage in girls and sanitation, are driving the change in nutrition outcomes.

To achieve progress in nutrition, the state should invest in improving the coverage of interventions targeting the first 1000 days of life. On nutrition-specifc interventions, during pregnancy, significant efforts are needed to improve ANC visits as the coverage is still low (26-37 percent). In addition, special attention is required to improve the extremely low IFA consumption (8.3 percent) during pregnancy, and coverage of supplementary food for pregnant women (20.6 percent). Interventions related to delivery have made considerable progress in the last ten years but it is important for Arunachal Pradesh to make further improvements as institutional deliveries, births assisted by health professionals and births registered are still far from optimal (below 63 percent).

Investments are needed to strengthen infant and young child feeding practices where the coverages are still far from adequate especially for adequate diet (13.9 percent) or showing reverse trends (exclusive breastfeeding and timely introduction of complementary foods) in the last 10 years. Further improvement is required for institutional delivery and newborn check-ups. For interventions related to the early childhood period, such as full immunization and vitamin A supplementation, much more improvement is required as the coverage is still low (38-39 percent). Further improvement is also requied for children receiving ORS during diarrhea which is not optimal (66.1 percent). Arunachal Pradesh has made tremendous progress in improving the coverage of supplementary food for children, but efforts need to continue as the coverage is still low (51.1 percent). Greater efforts are required to improve the coverage of supplemenatry nutrition for lactating women, which is extremely low at 25.9 percent. On underlying determinants, even though the state has made good progress in women's literacy and education, early marriage in girls and sanitation, further improvements are required. Finally, the inter-district variability across outcomes and multiple determinants call for district-specific strategies to bridge these gaps.

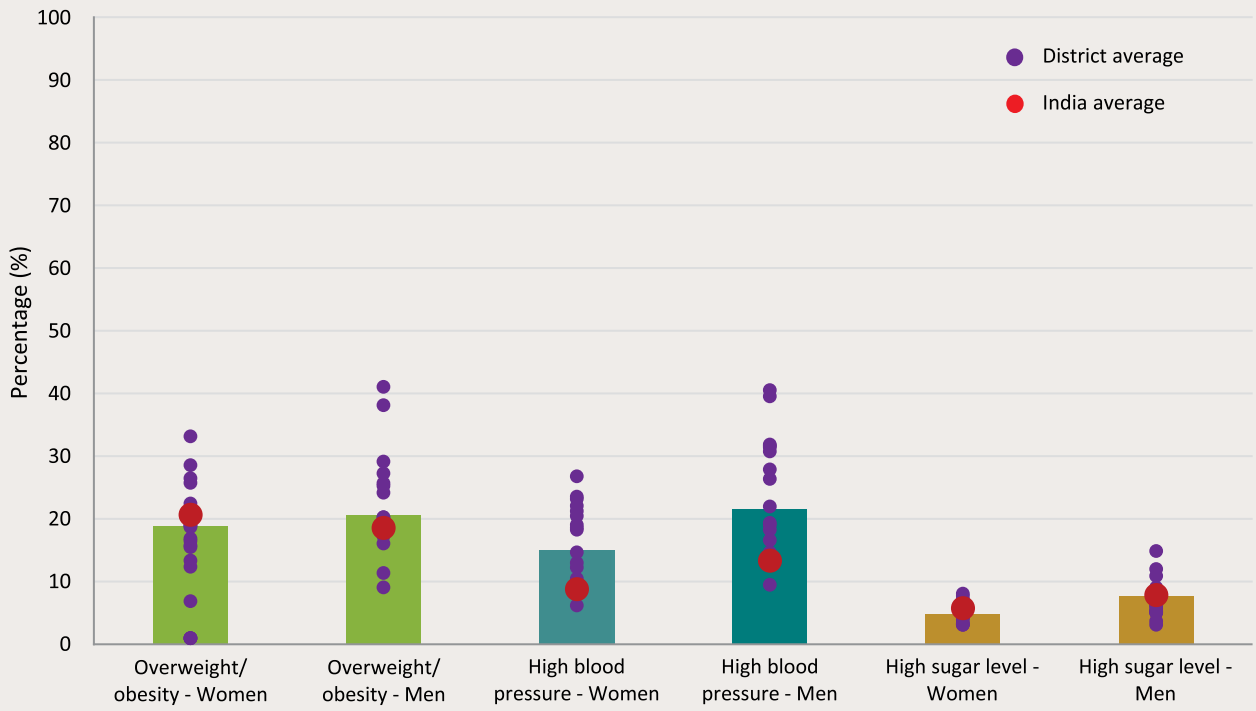
Alongside investments in improving early nutrition, it is also important for Arunachal Pradesh to consider the challenge of non-communicable diseases. As Figure 8 below shows, the challenge is fast emerging in Arunachal Pradesh, with 18.8 percent of women and 20.6 percent of men being overweight or obese. High blood pressure among both men and women in Arunachal Pradesh is higher than the national average and is a significant public health challenge. This suggests that Arunachal Pradesh needs to consider ways to simultaneously address undernutrition and emerging non-communicable diseases related to nutrition.

NOTES

1. Arunachal Pradesh currently consists of 21 districts. Since the National Family Health Survey-4 used the Census 2011 district boundaries, this Policy Note reports information for only 16 districts.
2. Indicator definitions, in alphabetical order:

   Acute respiratory infection (ARI) in the last two weeks: Percentage of children below 5 years of age with symptoms of ARI in 15 days preceding the survey.

FIGURE 8 Levels of non-communicable diseases in Arunachal Pradesh and India, in 2016



Source: NFHS-4.

Note: Refer to endnotes for indicator definitions.

Adequate diet: Percentage of children 6–23 months old who received 4 or more food groups and a minimum meal frequency.

ANC (4 or more visits): Percentage of mothers receiving at least 4 ANCs for the last birth in the last 5 years.

ANC (first trimester): Percentage of mothers who received antenatal care during the first trimester of pregnancy for the last birth in the last 5 years.

ANC-neonatal tetanus injections: Percentage of mothers who were protected against neonatal tetanus for the last birth in the last 5 years.

Anemia among women of reproductive age: Percentage of women 15–49 years old who are anemic (<12.0 g/dl for non-pregnant women and <11.0 g/dl for pregnant women).

Birth registered: Percentage of children under age 5 years whose birth was registered.

Consumed IFA ≥ 100 days during pregnancy: Percentage of mothers who took iron and folic acid supplements for at least 100 days for the last birth in the last 5 years.

Deworming: Percentage of children 6–59 months old who were given deworming medication in the last 6 months.

Diarrhea in the last two weeks: Percentage of children below 5 years of age who had diarrhea in 15 days preceding the survey.

Early initiation of breastfeeding: Percentage of children who were breastfed within one hour of birth.

Exclusive breastfeeding: Percentage of infants 0–5 months old who were exclusively breastfed.

Full immunization: Percentage of children 12–23 months old who received BCG, measles, and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth).

Girls married before the age of 18 years: Percentage of women 20–24 years old married before the age of 18 years.

High blood pressure: 15–49 years old men and women with systolic ≥140 mm of Hg and/or diastolic ≥90 mm of Hg.

High blood sugar: 15–49 years old men and women with blood sugar level >140 mg/dl.

Households with an improved drinking-water source: Percent distribution of households with an improved drinking water source.

Households with electricity: Percentage of households with electricity.

Households using improved sanitation facility: Percent distribution of households using improved sanitation facilities.

Institutional delivery: Percentage of births delivered in a health facility for births in the last 5 years.

Janani Suraksha Yojana (JSY) availed: Percentage of women who received financial assistance under JSY for births delivered in an institution for the last birth in the last 5 years.

Low birth weight: Percentage of live births in the last 5 years weighing less than 2,500 grams at birth.

Mother Child Protection (MCP) card: Percentage of registered pregnancies for which the mother received an MCP card.

Newborn check-up: Percentage of children who received a health check after birth from a doctor/nurse/LHV/ANM/midwife/ other health personnel within 2 days of birth.

Open defecation: Percentage of households having no sanitation facilities.

ORS during diarrhea: Percentage of children below 5 years of age who received ORS during diarrhea.

Overweight/obesity: 15–49 years old men and women with body mass index ≥25 kg/m^2.

Pediatric IFA: Percentage of children 6-59 months old who received iron and folic acid supplement in the last 6 months.

Pregnancy registered: Percentage of pregnancies registered among women who had a live birth in the 35 months preceding the survey.

Severe wasting: Percentage of children 0–59 months old who are <-3SD from median weight for height of the WHO Child Growth Standards.

Skilled birth attendant: Percentage of births assisted by a doctor/nurse/LHV/ANM/other health personnel.

Stunting: Percentage of children 0–59 months old who are <-2SD from median height for age of the WHO Child Growth Standards.

Supplementary food (children): Percentage of children 6–35 months old covered by an *Anganwadi* center (AWC) who received supplementary food provided at the AWC in the last 12 months.

Supplementary food (lactation): Percentage of mothers with children under the age of 6 years in areas covered by an AWC who received supplementary nutrition from the AWC during lactation.

Supplementary food (pregnancy): Percentage of mothers with children under the age of 6 years in areas covered by an AWC who received supplementary nutrition from the AWC during pregnancy.

Timely introduction of complementary foods: Percentage of infants 6–8 months old who received solid and semi-solid foods and breastmilk.

Visited by primary health worker (PHW): Percentage of women who were visited by a primary health worker (AWW/ASHA/ANM) at home within one week of delivery/discharge from health institution, among those who had a live birth in 35 months preceding the survey.

Vitamin A: Percentage of children 9–59 months old who received vitamin A supplements in the last six months.

Wasting: Percentage of children 0–59 months old who are <-2SD from median weight for height of the WHO Child Growth Standards.

Women who are literate: Percentage of women who are literate.

Women with at least 10 years of education: Percentage of women 15–49 years old having at least 10 years of schooling.

Women with body mass index (BMI) <18.5kg/m^2: Percentage of women 15–49 years old with BMI less than 18.5 kg/m^2.

Zinc during diarrhea: Percentage of children below 5 years of age who received zinc during diarrhea.

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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 build evidence on effective actions for nutrition and support the use of evidence in decision-making. It is supported by the Bill & Melinda Gates Foundation and led by IFPRI in India.

ABOUT POLICY NOTES

POSHAN Policy Notes aim to provide evidence-based guidance to support policy and program actions for nutrition in India.

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