

Improving Nutrition in Nagaland

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 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 its 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 Nagaland.

Nagaland, situated in the north-east of India, accounts for 0.5 percent of the area of the country and includes 11 districts (Government of Nagaland 2017). The state is home to close to 2 million people (0.2 percent of the population of India) of which 79.5 percent are literate (Census of India 2011). Nagaland has a sex ratio of 931 females per 1,000 males (Census of India 2011). The state is largely forested and is culturally diverse with over 16 major tribal groups (Government of Nagaland 2017).

The purpose of this *Policy Note* is to examine the trends in undernutrition in Nagaland 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 Nagaland.

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.

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, there have been improvements in nutrition outcomes in Nagaland between 2006 and 2016. During this period, stunting prevalence fell from 38.8 percent to 28.6 percent (Figure 1). Exclusive breastfeeding rates increased from 29.5 percent to 44.5 percent. Wasting reduced only slightly from 13.3 percent to 11.2 percent. The prevalence of low birth weight showed a reverse trend, increasing by 7.9 percentage points, from 11 percent in 2006 to 18.9 percent in 2016. In 2016, anemia among women of reproductive age was 23.9 percent, which is much lower than the national average of 53 percent.

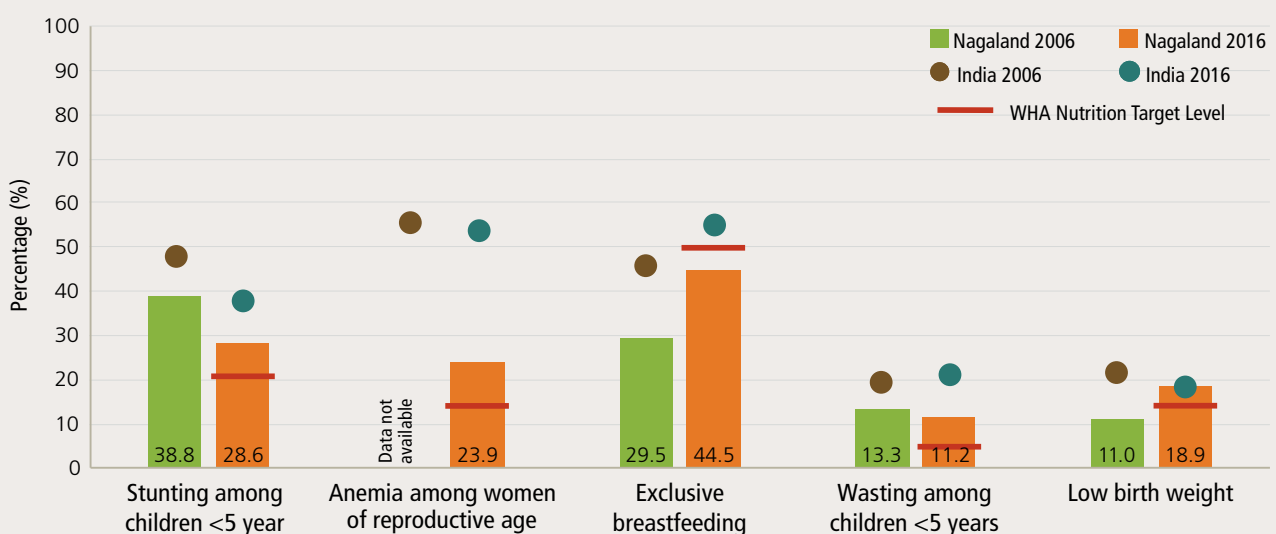
Stunting prevalence among children less than 5 years of age varies among districts, ranging from only 18.7 percent in Wokha to 41.8 percent in Kiphire (Map 1). Stunting is higher than 30 percent (rated as high) in 4 districts (Zunheboto, Mon, Tuensang and Kiphire). Anemia among women has high variability across districts with the highest prevalence (36.1 percent) in Mon and lowest (9 percent) in Phek. In 9 of the 11 districts, fewer than a third of women have anemia. Wasting ranges from 1.8 percent

(Mokokchung) to 21.4 percent (Mon) (Map 3). The prevalence of wasting is less than 10 percent in 5 of the 11 districts. Only the districts of Longleng and Mon have very high wasting prevalence (>15 percent). Severe wasting is low across districts. The highest prevalence of severe wasting is in Mon (9.8 percent) (Map 4). Exclusive breastfeeding (EBF) rates are missing for Mokokchung and Wokha districts. Among the remaining 9 districts, EBF varies widely and is the highest (75.0 percent) in Tuensang and lowest (33.2 percent) in Kohima in (Map 5). Mon performs poorly on all the nutrition outcomes (stunting – 35.6 percent; wasting – 21.4 percent; severe wasting – 9.8 percent; anemia among women of reproductive age – 36.1 percent).

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 of 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

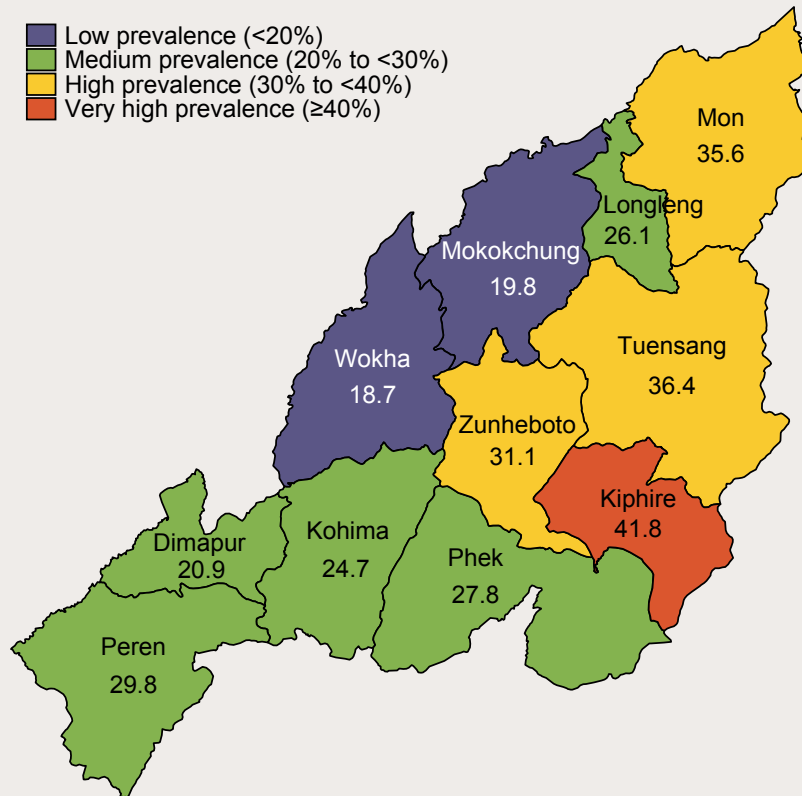
FIGURE 1 Trends in key nutrition outcomes in Nagaland, 2006 to 2016



Source: NFHS-3 and NFHS-4; RSOC data used for low birth weight.

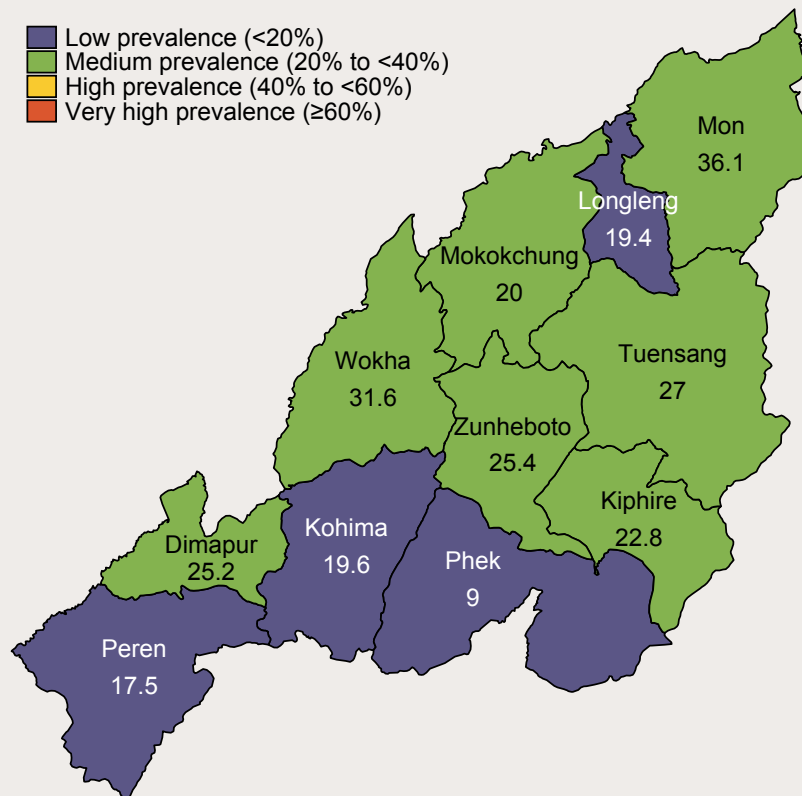
Note: A set of global nutrition targets for maternal, infant and young child nutrition were endorsed by the World Health Assembly (WHA) in 2012. The red lines represent the WHA targets to be achieved by the state, by 2025. The baseline reference year for these targets is 2012. The state baseline estimates 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 Nagaland in 2016, by district



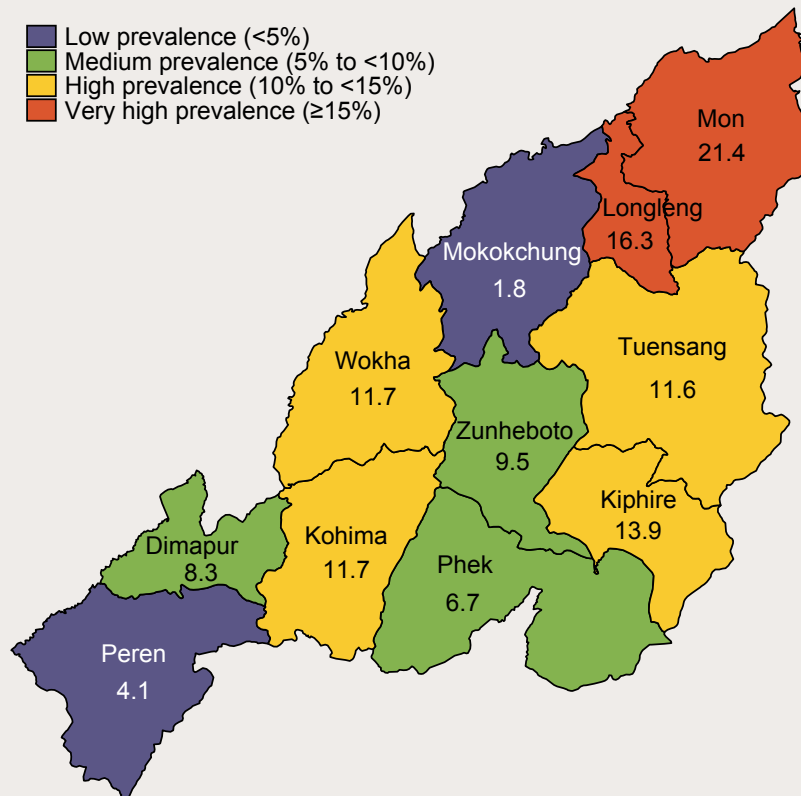
Source: NFHS-4.

MAP 2 Anemia (among women of reproductive age) in Nagaland in 2016, by district

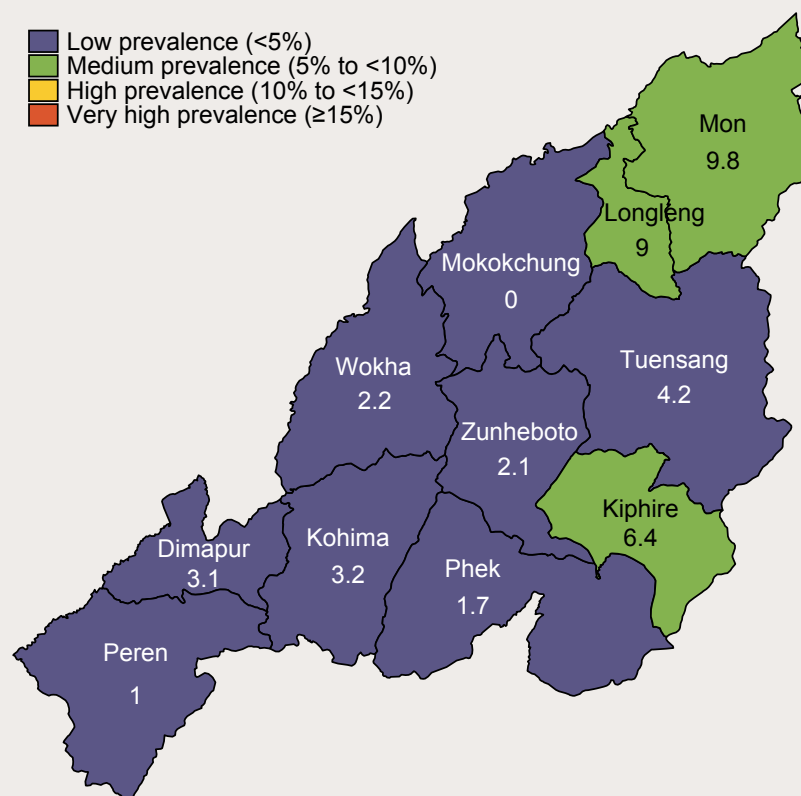


Source: NFHS-4.

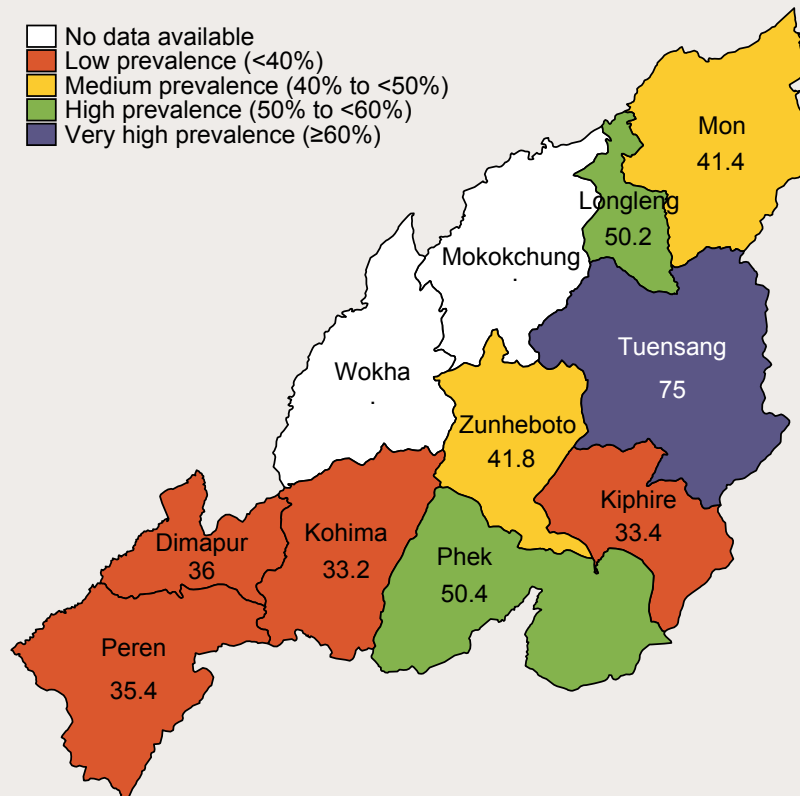
MAP 3 Wasting (among children <5 years) in Nagaland in 2016, by district



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



MAP 5 Exclusive breastfeeding in Nagaland in 2016, by district



Source: NFHS-4.

determinants in this Note because data on those are not available at this time.

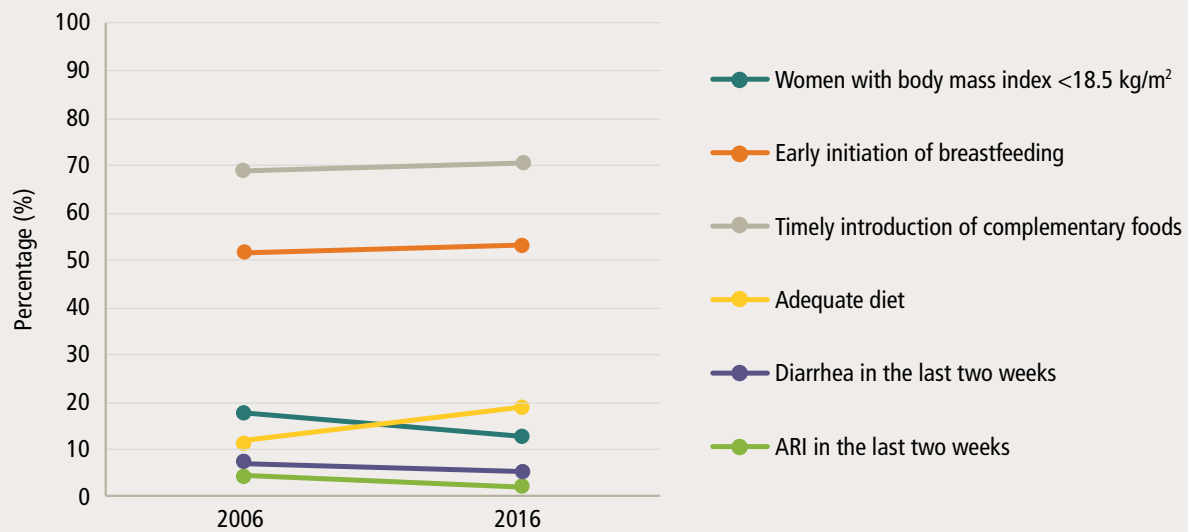
Changes in the **immediate determinants** of nutrition in Nagaland are described in Figure 2. The proportion of women with low body mass index (BMI <18.5 kg/m²) decreased from 17.4 percent in 2006 to 12.2 percent in 2016. Early initiation of breastfeeding improved marginally in the last decade from 51.4 percent to 53.2 percent, and nearly 47 percent of children are still not breastfed within an hour of birth. In the last ten years, prevalence of diarrhea among children declined marginally from 6.4 percent to 5 percent and the prevalence of acute respiratory infection also decreased from 4.2 percent to 1.4 percent.

Timely introduction of complementary foods (between 6 and 8 months of age) improved only slightly (from 69 percent to 70.7 percent). In 2016, only 18.6 percent of children (between 6 and 23 months of age) received an adequate diet.

Changes in the coverage of **nutrition-specific interventions** was mixed in the last decade (Figure

3). During pregnancy, the proportion of women who received antenatal care (ANC) during the first trimester got worse by 4.3 percentage points, from 29.2 percent in 2006 to 24.9 percent in 2016. The proportion of women who received at least 4 ANC visits, however, increased from 12.1 percent to 15 percent. Iron and folic acid (IFA) consumption during pregnancy improved from 1.2 percent to 4.4 percent, but the coverage is still extremely low. Interventions related to delivery, such as institutional delivery and births assisted by health professionals, increased by 11 to 17 percentage points reaching between 32 and 41 percent in 2016. Births registered increased substantially from 36.9 percent to 68.3 percent. Between 2006 and 2016, the coverage of food supplementation declined for all the beneficiary groups (pregnancy through early childhood). For pregnant women, the coverage declined from 5.4 percent in 2006 to 0 percent, for lactating mothers, from 4.3 percent to 3 percent and for children, from 35.8 percent to 9 percent. Nutrition interventions focused on children have improved in the last ten years. The proportion of children receiving vitamin A supplementation

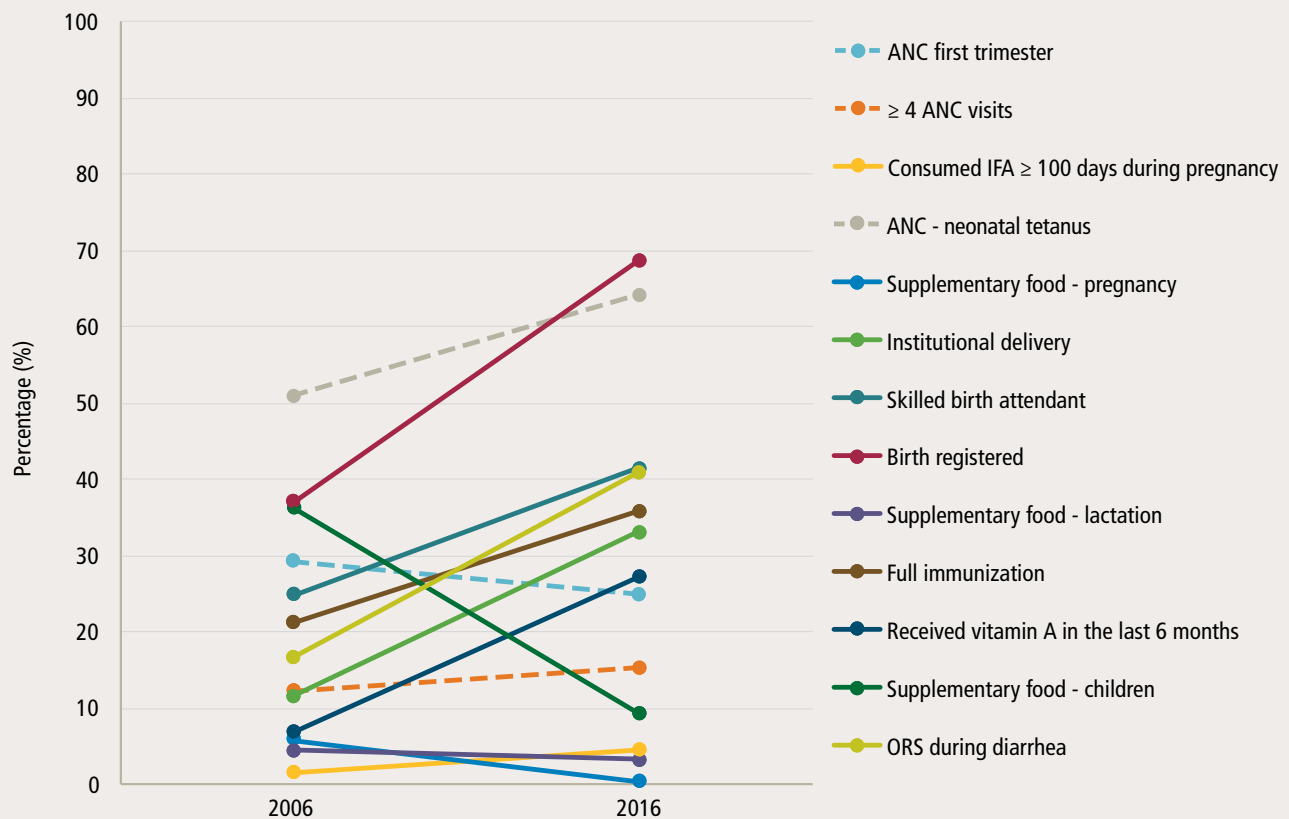
FIGURE 2 Changes in immediate determinants of nutrition in Nagaland, 2006 to 2016



Source: NFHS-3 and NFHS-4.

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

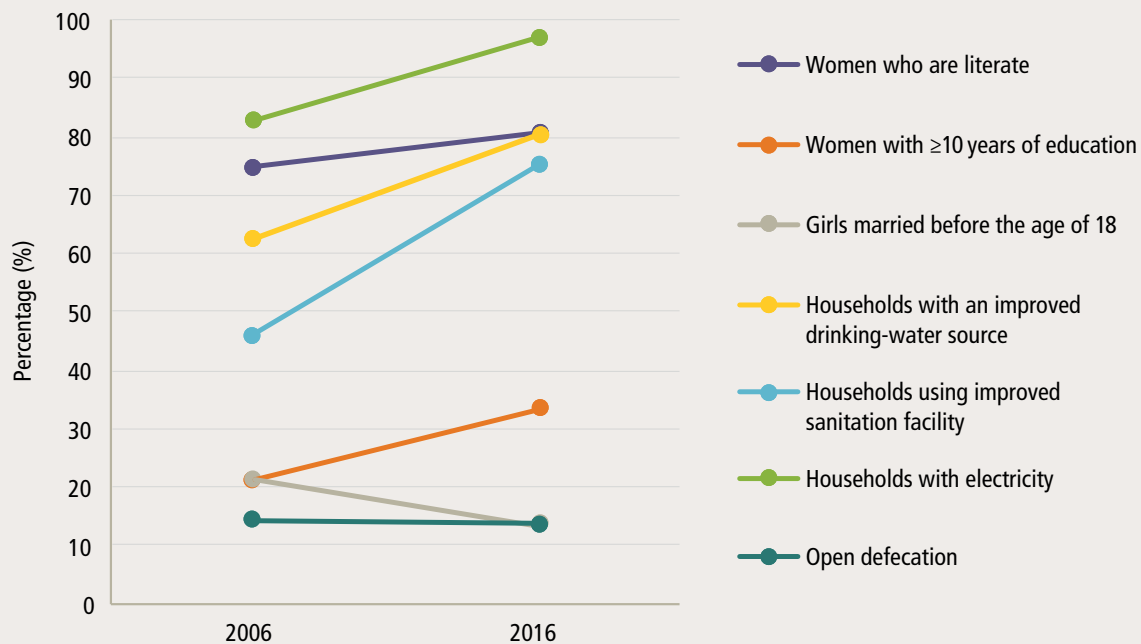
FIGURE 3 Changes in coverage of nutrition-specific interventions along the continuum of care in Nagaland, 2006 to 2016



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 Nagaland, 2006 to 2016



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

Note: Refer to endnotes for indicator definitions.

increased from 6.6 percent to 27.1 percent. Children with diarrhea who received oral rehydration salts (ORS) increased considerably from 16.5 percent to 40.8 percent. The proportion of children who were fully immunized increased from 21 percent to 35.7 percent, but over one third of the children in the state still do not receive full immunization.

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 75.2 percent to 81 percent), and the proportion of women with more than 10 years of education (from 21.5 percent to 33.3 percent). Early marriage in girls reduced by 8.1 percentage points, from 21.4 percent in 2006 to 13.3 percent in 2016.

In Infrastructure, households with an improved drinking-water source increased substantially from 62.8 percent in 2006 to 80.6 percent in 2016, and households with electricity increased from 82.9 percent to 97 percent. Nagaland has made good progress in sanitation during this period. Households using improved sanitation facility

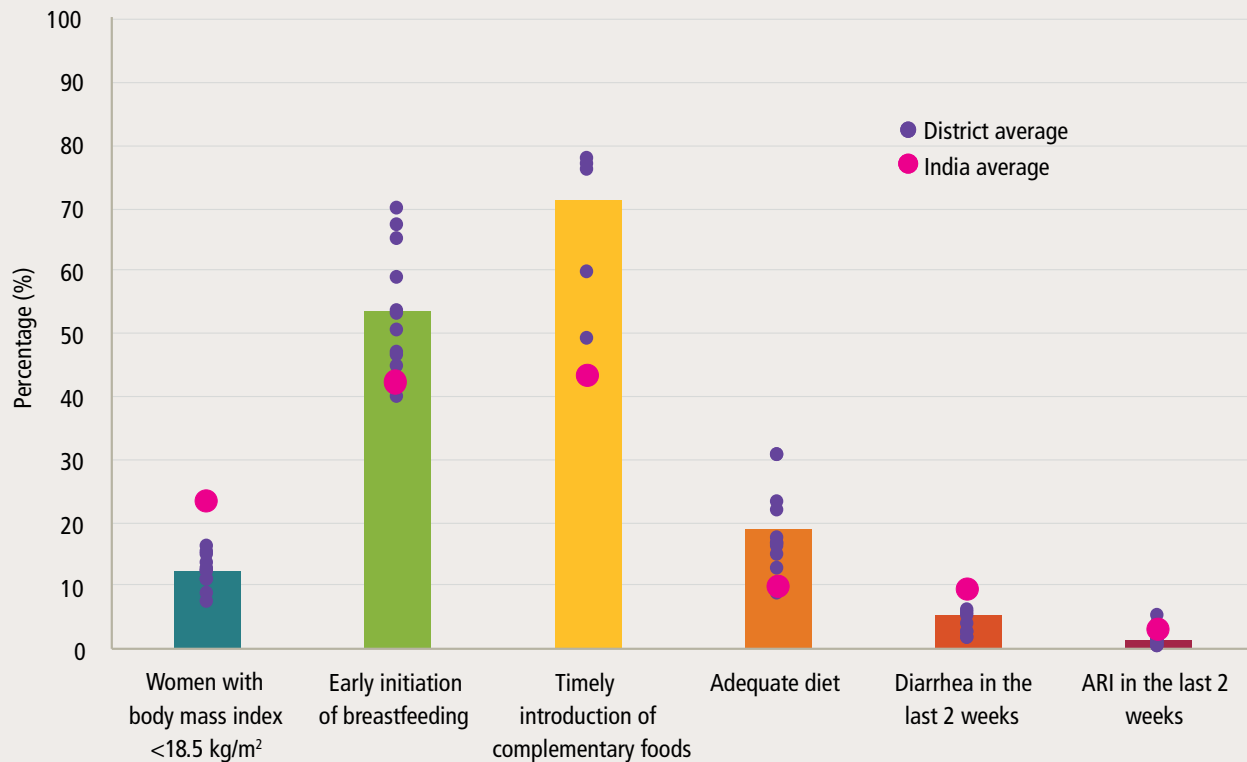
increased considerably from 46.5 percent to 75.2 percent. There has been a marginal decline in open defecation from 14.4 percent to 14 percent.

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

The 11 districts of Nagaland for which NFHS-4 data is available cover a range of socio-economic characteristics. As seen in Figures 5-7, among these districts there is a high degree of variability for most of the immediate and underlying determinants as well as on the coverage of interventions. There is a limited inter-district variability for women with low body mass index, children with diarrhea, use of Mother and Child Protection (MCP) card and the number of births registered.

On some indicators, for example, early initiation of breastfeeding, adequate diet, women who are literate, and household access to improved sanitation facilities, most districts of Nagaland are performing better than the national average. On several other indicators, including ANC, institutional delivery, skilled birth attendant, full immunization, vitamin A

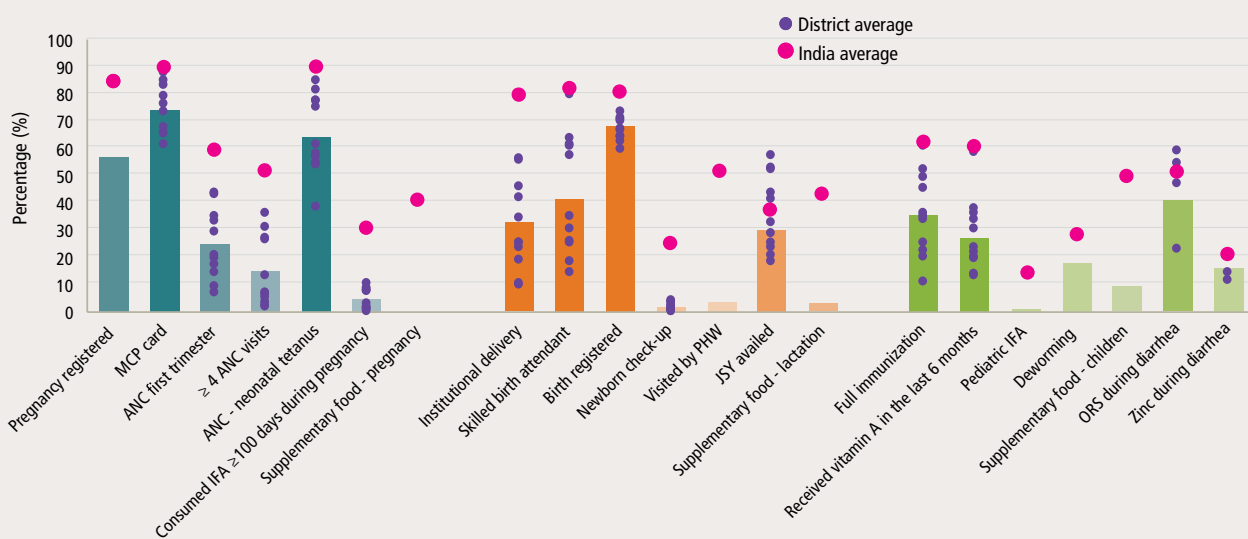
FIGURE 5 Inter-district variability in immediate determinants in Nagaland, in 2016



Source: NFHS-4.

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

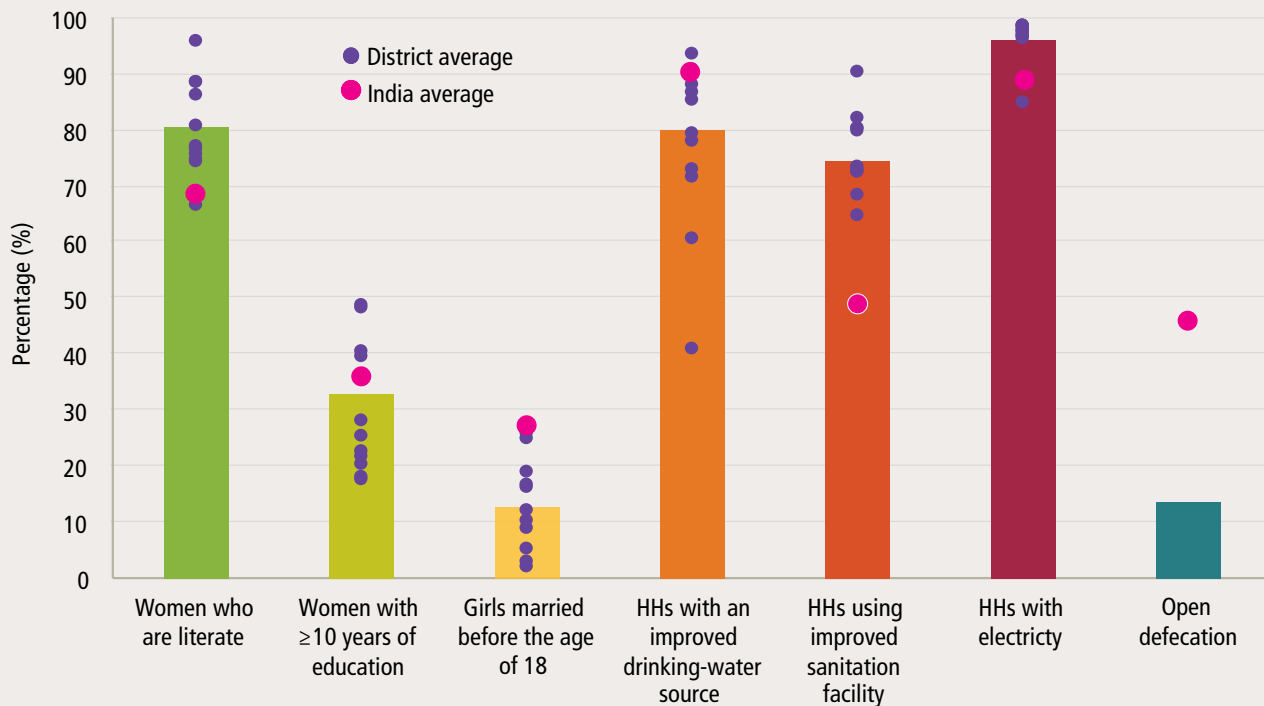
FIGURE 6 Inter-district variability in coverage of selected interventions in Nagaland, in 2016



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 variability is unavailable for these indicators; ANC= Antenatal care; IFA= Iron and folic acid; JSY= Janani Suraksha Yojana; ORS= Oral rehydration salts; MCP= Mother and child protection; PHW= Primary health worker; Refer to endnotes for indicator definitions.

FIGURE 7 Inter-district variability in underlying determinants in Nagaland, 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.

supplementation, and households using an improved drinking-water source, most districts in Nagaland are performing poorly compared to the national average. For the rest of the indicators for which data is available, the coverage for most districts in Nagaland is nearly close to the national average.

LOOKING FORWARD: IMPLICATIONS & RECOMMENDATIONS

In an era where India has now embraced the sustainable development goals, it is an opportune time for Nagaland 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 seen improvement in the coverage of some nutrition-specific interventions, such as care during pregnancy and delivery, postnatal care and care for children. However, these improvements have been far from adequate. The state has however made some progress in reduction of stunting, and wasting. However, the state has not made progress in reducing the prevalence of low birth weight which has actually increased in the last

ten years and is currently very high (more than 15 percent).

To achieve progress in nutrition, the state should invest in improving the coverage of interventions targeting the first 1000 days of life, a majority of which are currently reaching less than half of the population. On nutrition-specific interventions during pregnancy, significant efforts are needed to improve ANC visits as the coverage is still low (15-25 percent). In addition, special attention is required to improve the extremely low IFA consumption (4.4 percent) as well as very low to nil coverage of food supplementation among all the beneficiaries (pregnant and lactating women and children below three years). Interventions related to delivery have made considerable progress in the last ten years. But it is important for Nagaland to make further improvements as the number of institutional deliveries and births assisted by health professionals are still less than 50 percent.

Investments are needed to strengthen the coverage of several postnatal interventions, particularly infant and young child feeding practices where the

coverages are still far from adequate especially for adequate diet (18.6 percent), and exclusive breastfeeding (44.5 percent). For other early childhood interventions, such as full immunization, vitamin A supplementation and ORS during diarrhea, much more improvement is required as their coverage is very low (27-41 percent). On underlying determinants, the state has made good progress in female literacy. However, only a third of women have ten or more years of education. Therefore, investments are required to improve women's education. Finally, the inter-district variability across outcomes and multiple determinants call for district-specific strategies.

Alongside investments in improving early nutrition, it is also important for Nagaland to consider the challenge of non-communicable diseases. As Figure 8 below shows, the challenge is fast emerging in Nagaland, with 16.2 percent of women and 14 percent of men being overweight or obese. High blood pressure and high blood sugar are other emerging public health challenges. High blood pressure among women in Nagaland is nearly double that of the national average. Similarly, high blood

pressure among men (23.1 percent) is 10 percentage points higher than the national average (13.4 percent). The high blood sugar levels among women and men of Nagaland are slightly higher than the national average. This suggests that Nagaland needs to consider ways to simultaneously address undernutrition and emerging non-communicable diseases related to nutrition.

NOTES

1. 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.

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

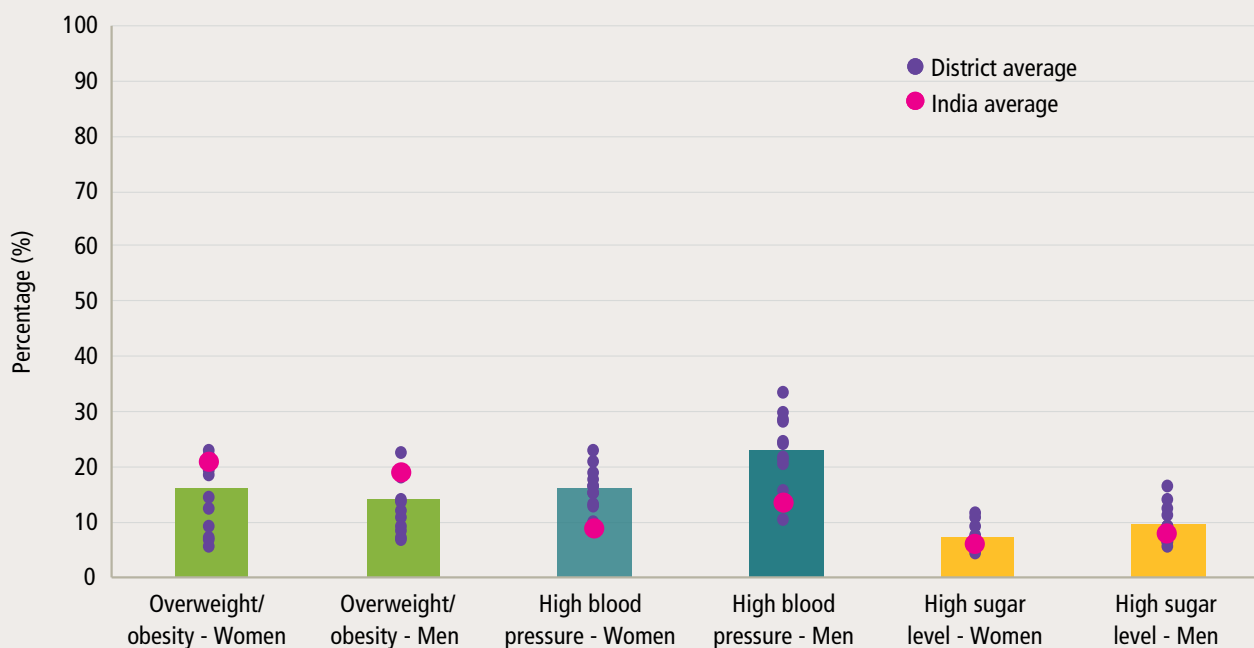
ANC (4 or more visits): Percentage of mothers receiving at least 4 ANC visits for the last birth in the last 5 years.

ANC (first trimester): Percentage of mothers who received ANC 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).

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



Source: NFHS-4.

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

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

Consumed IFA \geq 100 days during pregnancy: Percentage of mothers who took IFA 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 \geq 140 mm of Hg and/or diastolic \geq 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 household 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 \geq 25 kg/m².

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/m²: Percentage of women 15–49 years old with BMI less than 18.5 kg/m².

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

REFERENCES

- Black, R.E., C.G Victora, S.P. Walker, Z.A. Bhutta, P. Christian, M.D. Onis, M. Ezzati, et al. 2013. "Maternal and Child Undernutrition and Overweight in Low-Income and Middle-Income Countries." *The Lancet* 382 (9890): 427–51.
- Census of India. Accessed June 2017. <http://censusindia.gov.in/2011census/censusinfodashboard/>.
- Global Targets 2025. World Health Organization. 2014. Accessed April 2017. <http://www.who.int/nutrition/global-target-2025/en/>.
- Government of Nagaland. Accessed June 2017. <https://www.nagaland.gov.in/portal/portal/StatePortal/AboutNagaland/NagalandInfo>.
- India Fact Sheet. NFHS-4 (National Family Health Survey-4), International Institute for Population Studies. 2017. Accessed April 2017. <http://rchiips.org/NFHS/pdf/NFHS4/India.pdf>.
- India Report. NFHS-3 (National Family Health Survey-3), International Institute for Population Studies. 2008. Accessed April 2017. http://rchiips.org/nfhs/volume_1.shtm.
- RSoc (Rapid Survey on Children), Ministry of Women and Child Development, Government of India. 2014. Accessed February 2017. <http://wcd.nic.in/acts/rapid-survey-children-rsoc-2013-14>.

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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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