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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 Uttarakhand

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 Uttarakhand.

Uttarakhand, located in the foothills of the Himalayan mountain range, was formed in November 2000 as the 27th State of India. The state, largely forested, accounts for 1.6 percent of the area of the country and includes 13 districts (Government of Uttarakhand 2017). The state is home to more than 10 million people (0.8 percent of the population of India) of which 78.8 percent are literate (Census of India 2011). Uttarakhand has a sex ratio of 963 females per 1,000 males (Census of India 2011).

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

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 the 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 . We used summary data reported in NFHS-4 district-level 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 the 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 has been an improvement in nutrition outcomes in Uttarakhand between 2006 and 2016. Stunting prevalence fell from 44.4 percent to 33.5 percent (Figure 1). Anemia among women of reproductive age decreased from 54.7 to 45.2 percent. The prevalence of exclusive breast-feeding also improved from 31.2 to 51 percent in the last ten years. The prevalence of low birth weight decreased by 10 percentage points, from 24.6 to 14.2 percent. Wasting, however, increased slightly from 18.8 in 2006 to 19.5 percent in 2016.

Stunting among children below five years of age ranges from 22.9 percent in Pauri Garhwal to 39.1 percent in Haridwar (Map 1). Nine out of 13 districts in Uttarakhand had high prevalence of stunting (30-40 percent) in 2016. The prevalence of anemia among women of reproductive age varies across districts with the highest prevalence (55.3 percent) in Haridwar and the lowest (32.9 percent) in Almora (Map 2). Anemia among women is high (40-60 percent) in 7 districts in Uttarakhand, which indicates that anemia among women is a significant public health concern.

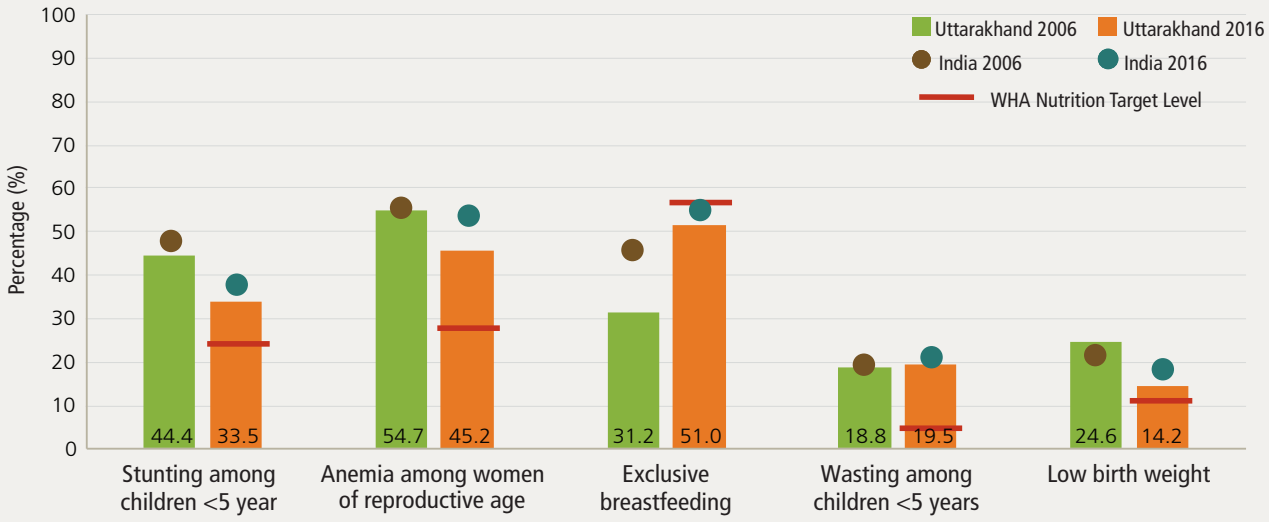
Wasting ranges widely across districts from 9 percent (Nainital) to 46.9 percent (Tehri Garhwal) (Map 3), and 9 districts have very high (>15 percent) wasting prevalence. Severe wasting ranges from 3.5 percent in Udham Singh Nagar to 28.1 percent in Tehri Garhwal (Map 4). Exclusive breastfeeding (EBF) rates are available for 11 out of 13 districts. Among these districts, EBF is the highest (69 percent) in Dehradun and the lowest (21.5 percent) in Bageshwarin (Map 5).

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 Uttarakhand are described in Figure 2. The proportion of women with low body mass index (BMI <18.5 kg/m^2) fell from 30 percent in

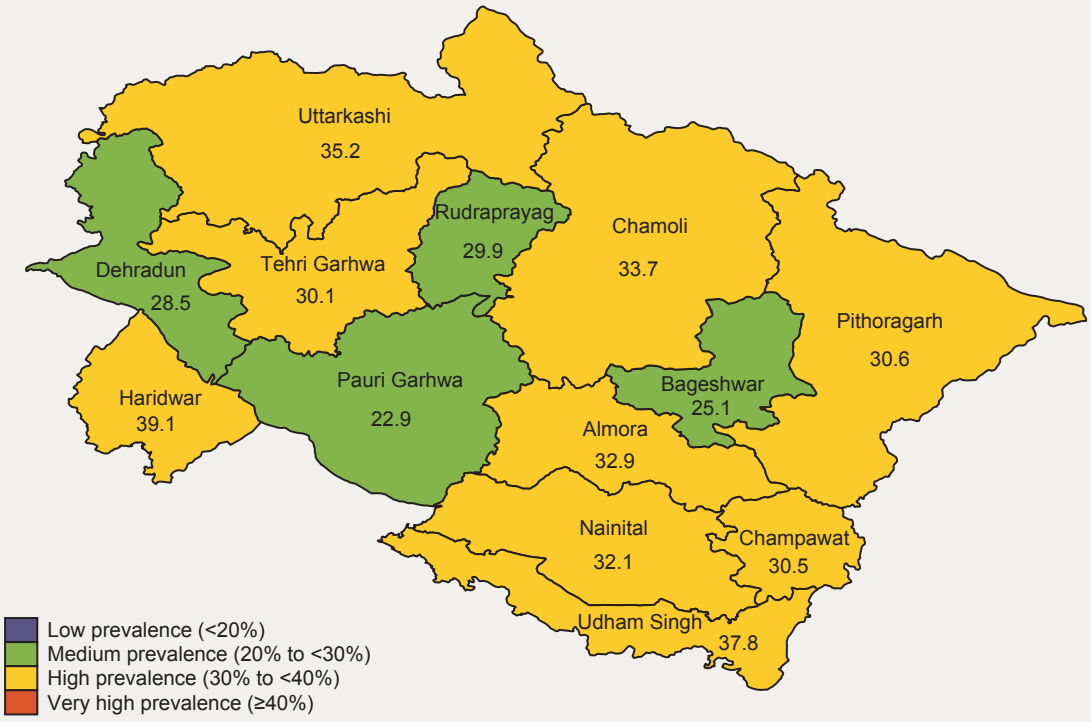
FIGURE 1 Trends in key nutrition outcomes in Uttarakhand, 2006 to 2016



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

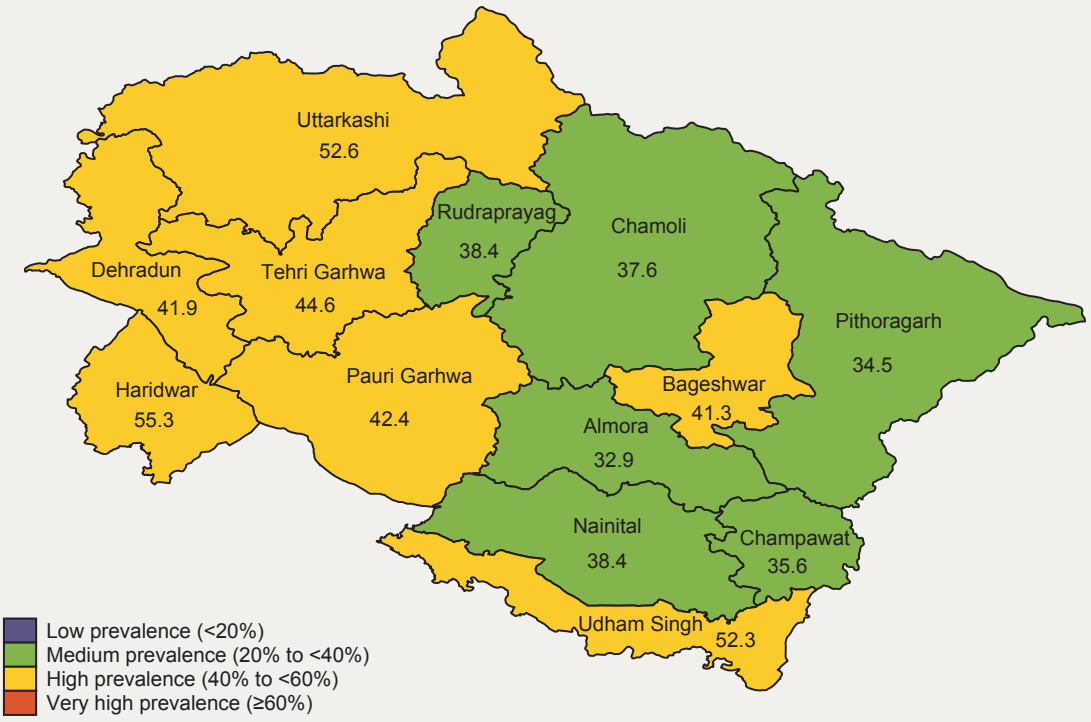
Note: A set of global nutrition targets for maternal, infant and young child nutrition were endorsed by the World Health Assembly (WHA) in 2012. The red lines represent the WHA targets to be achieved by the state, by 2025. The baseline reference year for these targets is 2012. The state baseline estimates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



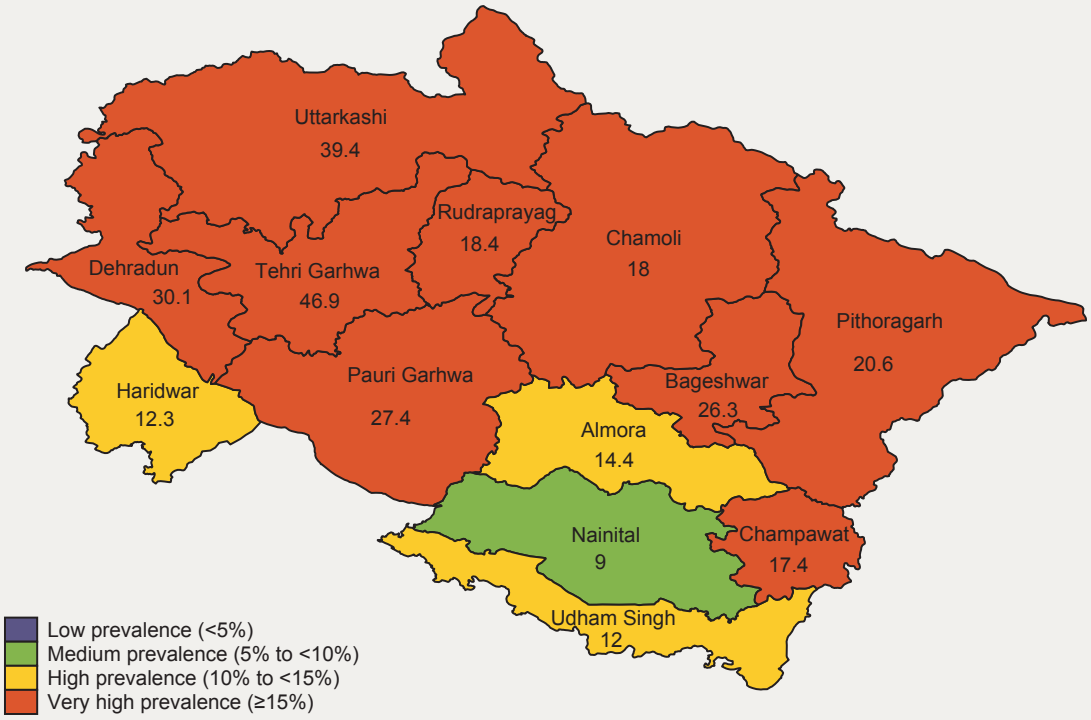
Source: NFHS-4.

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



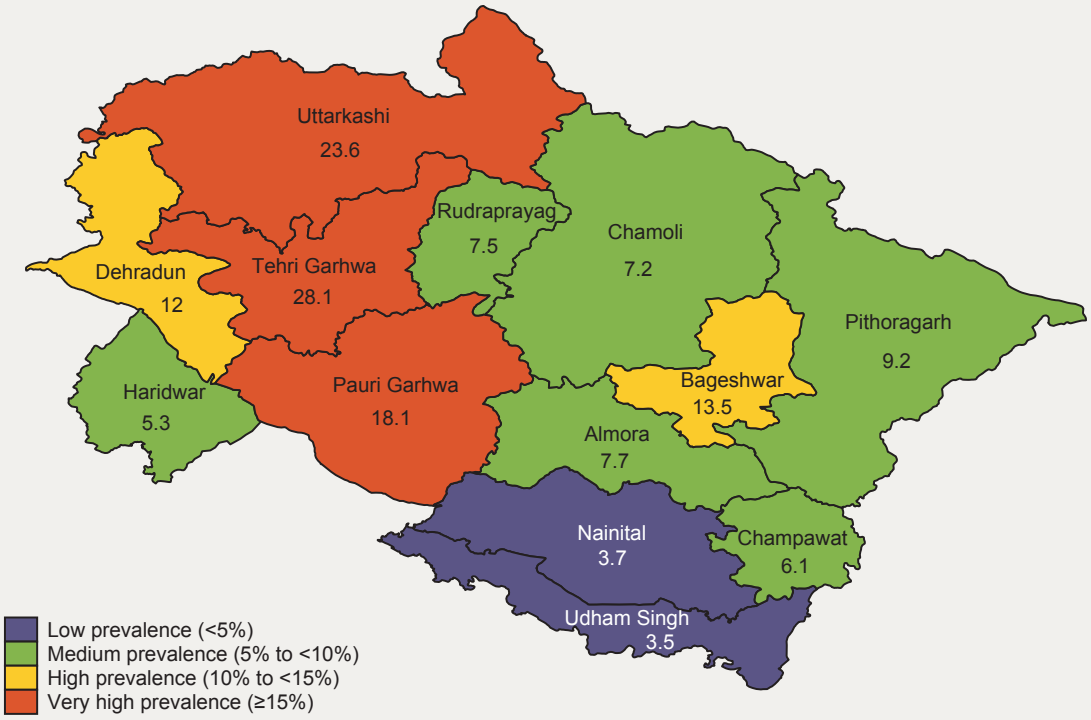
Source: NFHS-4.

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



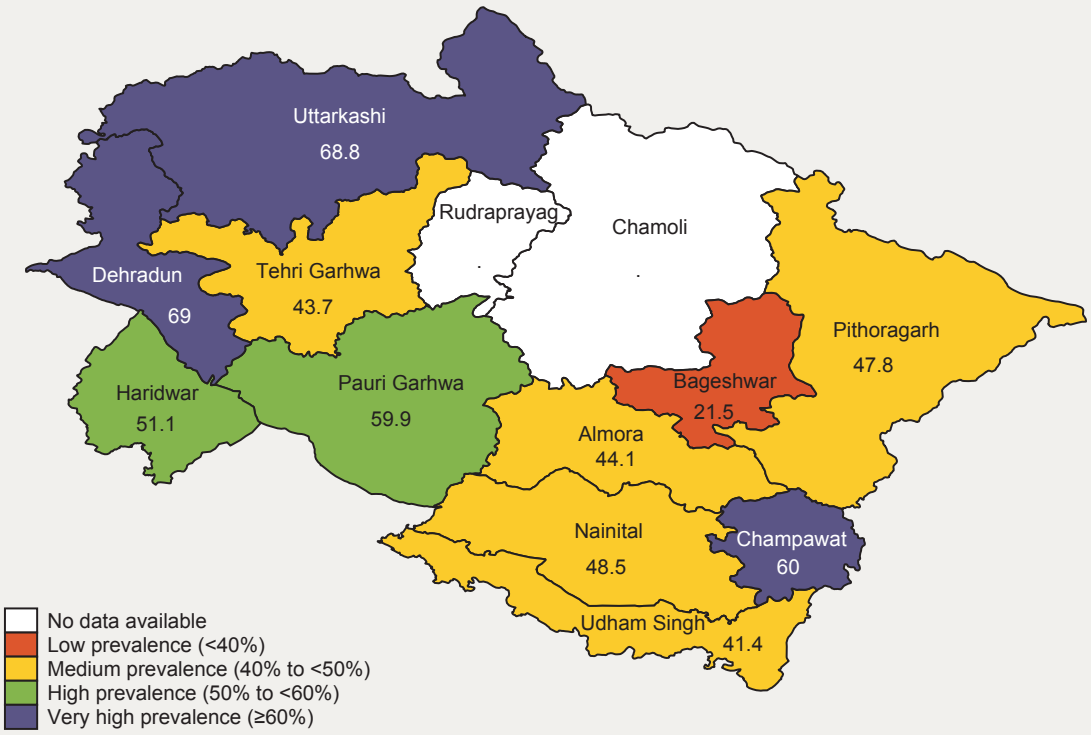
Source: NFHS-4.

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



Source: NFHS-4.

MAP 5 Exclusive breastfeeding in Uttarakhand in 2016, by district



Source: NFHS-4.

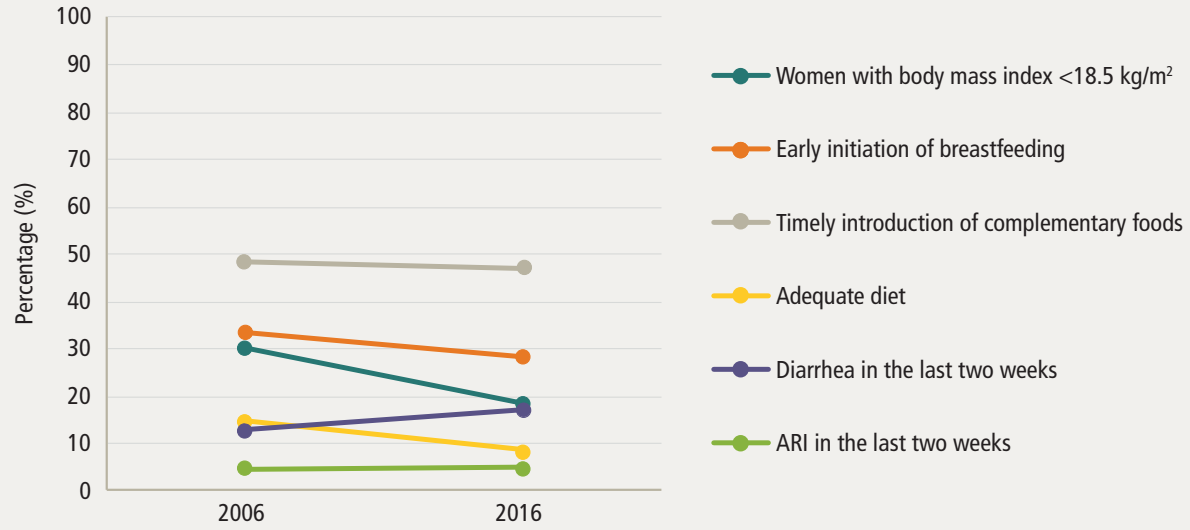
2006 to 18.4 percent in 2016. Other immediate determinants did not improve in the last decade. Early initiation of breastfeeding declined from 32.9 to 27.8 percent during this period. Child morbidity had a reverse trend; it increased from 12.8 to 17 percent for diarrhea, and from 4.3 to 4.6 percent for acute respiratory infection.

Complementary feeding is still far from adequate in Uttarakhand, as it is for India. Timely introduction of complementary foods (between 6 and 8 months of age) declined slightly over the last decade (from 47.8 to 46.7 percent). In 2016, only 8.5 percent of children (between 6 and 23 months of age) received an adequate diet.

Overall, changes in the coverage of ***nutrition-specific interventions*** in Uttarakhand have been mixed (Figure 3). During pregnancy, the proportion of women who received antenatal care (ANC) during the first trimester increased by 10 percentage points, from 43.3 percent in 2006 to 53.5 percent in 2016. However, the proportion of women who received at least 4 ANC visits decreased from 34.9 percent to 30.9 percent during this period. Iron and folic acid (IFA) consumption during pregnancy improved from 16.4 to 24.9 percent, but three quarter of women still do not consume IFA during pregnancy. Interventions related to child-birth, such as institutional deliveries, births assisted by health professionals, and births registered improved substantially by 33 to 38 percentage points, ranging from 69 to 77 percent in 2016. Although coverage of food supplementation improved for lactating women (from 14.1 to 21 percent), it declined for pregnant women (from 18.9 to 12.3 percent) and children (from 26.4 to 18.6 percent) between 2006 and 2016. The overall coverage of food supplementation remains very low for all beneficiaries. Nutrition interventions that focus on children remain a challenge. The proportion of children who were fully immunized declined from 60 percent to 57.7 percent. Although vitamin A supplementation increased from 12.8 percent to 36.9 percent, it is far from optimal. The proportion of children with diarrhea who received Oral Rehydration Salts (ORS) increased from 33.1 to 56.1 percent during this period.

Changes in ***underlying determinants*** of nutrition are presented in Figure 4. Between 2006 and 2016

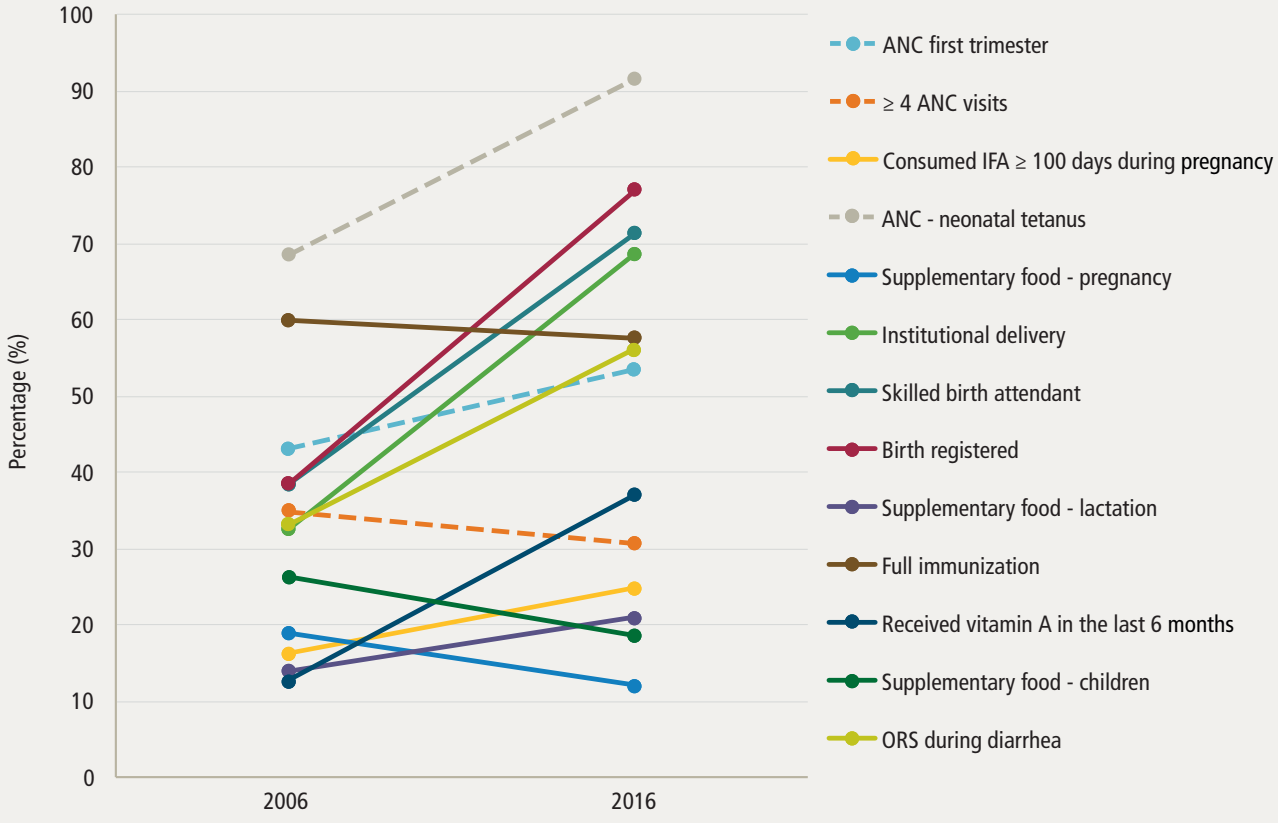
FIGURE 2 Changes in immediate determinants of nutrition in Uttarakhand, 2006 to 2016



Source: NFHS-3 and NFHS-4.

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

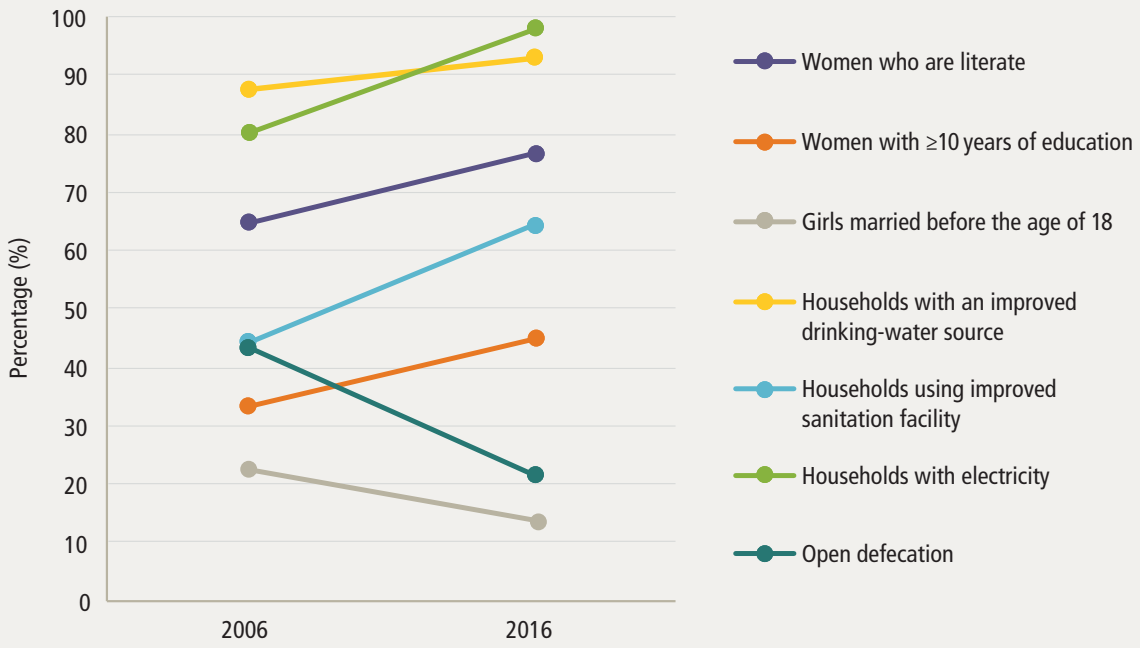
FIGURE 3 Changes in coverage of nutrition-specific interventions along the continuum of care in Uttarakhand, 2006 to 2016



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 Uttarakhand, 2006 to 2016



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

Note: Refer to endnotes for indicator definitions.

there has been an increase in the proportion of women who are literate (from 64.7 to 76.5 percent) and the proportion of women with more than 10 years of education (from 33.5 percent to 44.6 percent). Early marriage in girls has decreased from 22.6 percent in 2006 to 13.9 percent in 2016.

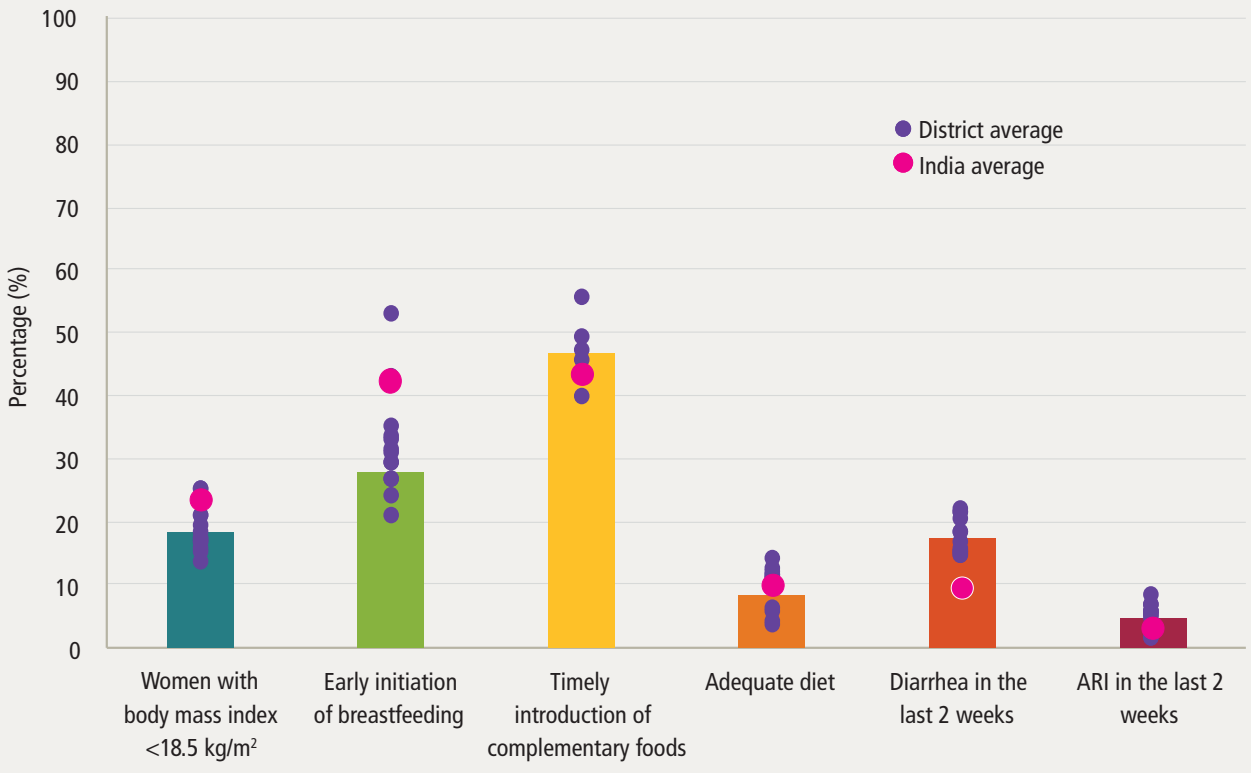
Infrastructure, in particular the proportion of households with an improved drinking-water source and electricity, improved in Uttarakhand by 5.5 to 17.5 percentage points, reaching over 90 percent in 2016. Proportion of households using improved sanitation facility increased from 44.4 to 64.5 percent. Open defecation rates reduced by more than half from 43.2 to 21.6 percent (RSoC 2013–14).

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

The 13 districts of Uttarakhand 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 inter-district variability for many of the determinants (that is, care during pregnancy and delivery, Janani Suraksha Yojana (JSY) availed, full immunization, vitamin A supplementation, ORS and zinc during diarrhea, girls married before 18, and women's education). There is less inter-district variability for determinants where the levels are high across majority of districts (that is, the use of mother and child protection (MCP) cards, ANC neonatal tetanus and households with an improved drinking-water source and electricity).

For some indicators, for example, women with low BMI (<18.5 kg/m^2), use of MCP cards, JSY availed, women's education, girls married before 18 years of age, households using improved sanitation facility and households with electricity, most districts are doing better than the national average. For other indicators, for example, at least 4 ANC visits, early initiation of breastfeeding, diarrhea and ARI in children in the last 2 weeks, and vitamin A supplementation, most districts in Uttarakhand are doing worse than the all India average. For the rest of the indicators, such as timely introduction of complementary foods, adequate diet in children, and ORS during diarrhea, the coverage for most districts in Uttarakhand is around the national average.

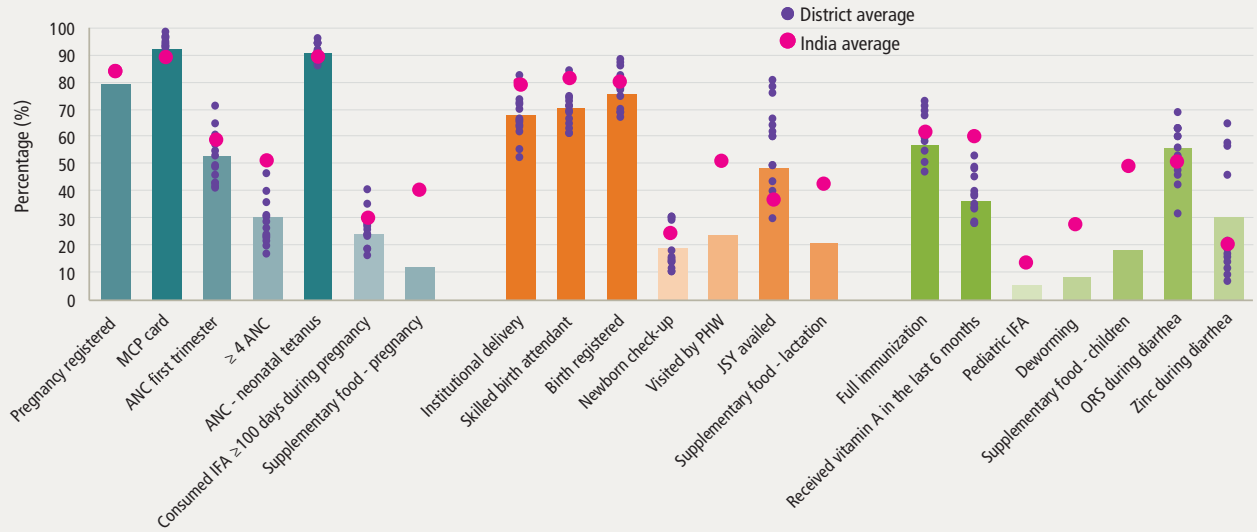
FIGURE 5 Inter-district variability in immediate determinants in Uttarakhand, in 2016



Source: NFHS-4.

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

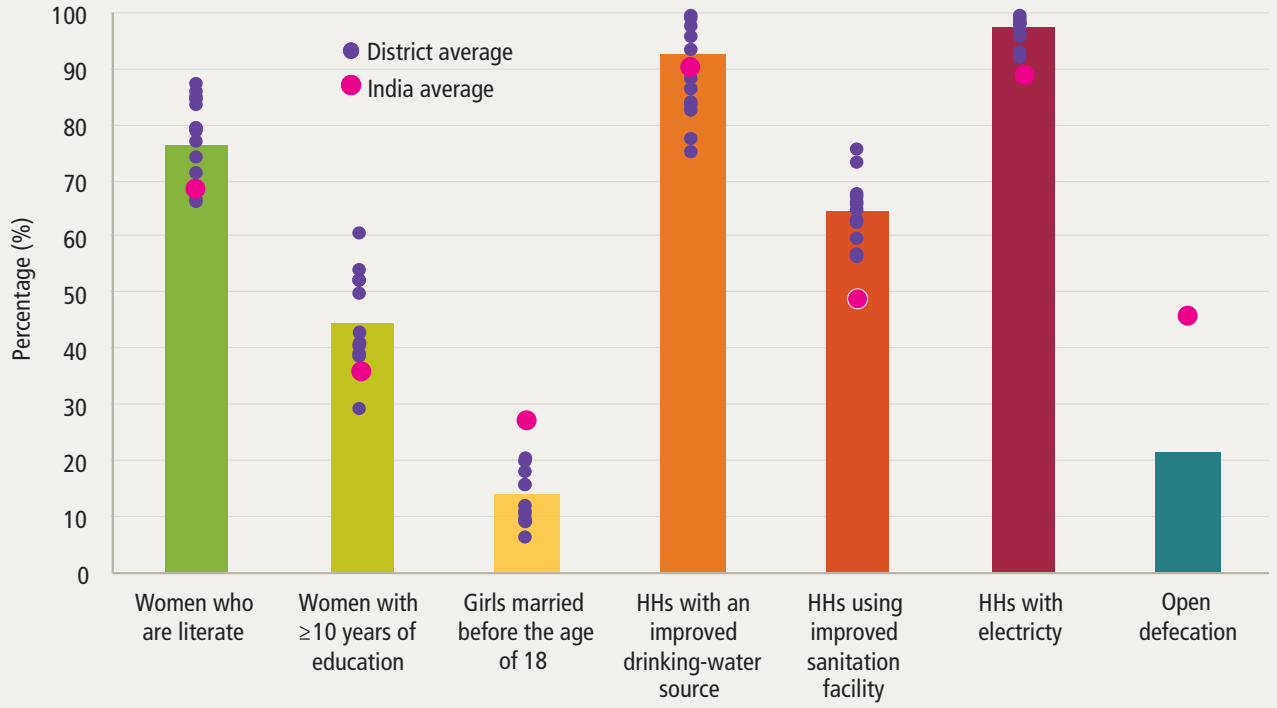
FIGURE 6 Inter-district variability in coverage of selected interventions in Uttarakhand, in 2016



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 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 Uttarakhand, 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.

LOOKING FORWARD: IMPLICATIONS & RECOMMENDATIONS

In the era where India has now embraced the sustainable development goals, it is an opportune time for Uttarakhand 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, Uttarakhand has made significant improvements in the coverage of most underlying determinants of nutrition, such as sanitation and women's status and in some nutrition sensitive interventions such as care during delivery and vitamin A supplementation. These improvements seem to commensurate with the progress in reduction of stunting, anemia in women and low birth weight. However, the state has not made improvements in wasting, which has actually shown a reverse trend in the last ten years and is currently very high (>15 percent) in two-third of districts in the state.

To achieve progress in nutrition, the state should invest in improving the coverage of interventions targeting the first 1000 days of life. On nutrition-specific interventions during pregnancy, significant efforts are needed to strenghten ANC visits, given that less than a third of the women received 4 ANC visits. In addition, special attention is required to improve the very low coverage of IFA consumption (24.9 percent) and even lower coverage of supplementary food for pregnant women (12.3 percent), which has actually declined since 2006. Interventions related to delivery have made considerable progress in the last ten years but further improvement is required as institutional deliveries, and births assisted by health professionals are still not optimal (below 72 percent).

Significant investments are needed to strengthen the coverage of several postnatal interventions, particularly infant and young child feeding practices (early initiation of breastfeeding and timely introduction of foods), where the coverages are either very low (8.5 percent for adequate diet), or have gotten worse in the last 10 years. For other postnatal care related interventions, such as vitamin A supplementation and ORS during diarrhea, further improvements are required as the coverage is still low (37-56 percent). In addition, full immunization needs special attention as not only did it show a reverse

trend in the last ten years but its coverage is still very low (57.7 percent). Significant efforts are also required to improve low coverage of supplementary food for lactating women (21 percent) and children (18.6 percent).

On underlying determinants, Uttarakhand has done well in the proportion of households with an improved drinking-water source which is over 90 percent. The state should continue its efforts to maintain this good progress. However, more efforts are required to improve sanitation, as 35.5 percent of the households are still not using improved sanitation facilties. There has been good progress in improving the status of women, especially in reducing the number of early marriages among girls in the state. However, further improvements can be made to improve women's education. Finally, the inter-district variability across outcomes and multiple determinants calls for district-specific strategies to bridge these gaps.

Alongside investments in improving early nutrition, it is also important for Uttarakhand to consider the challenge of non-communicable diseases. As Figure 8 below shows, this challenge is emerging in Uttarakhand, with 20.4 percent of women and 17.7 percent of men being overweight or obese, which is close to the national average. The prevalence of overweight or obesity is highest in Nainital (27.2 percent for women) and Dehradun (21.6 percent for men). High blood pressure and high blood sugar, for both men and women, are other significant public health challenges in Uttarakhand; they are higher than the national average. This suggests that Uttarakhand 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.

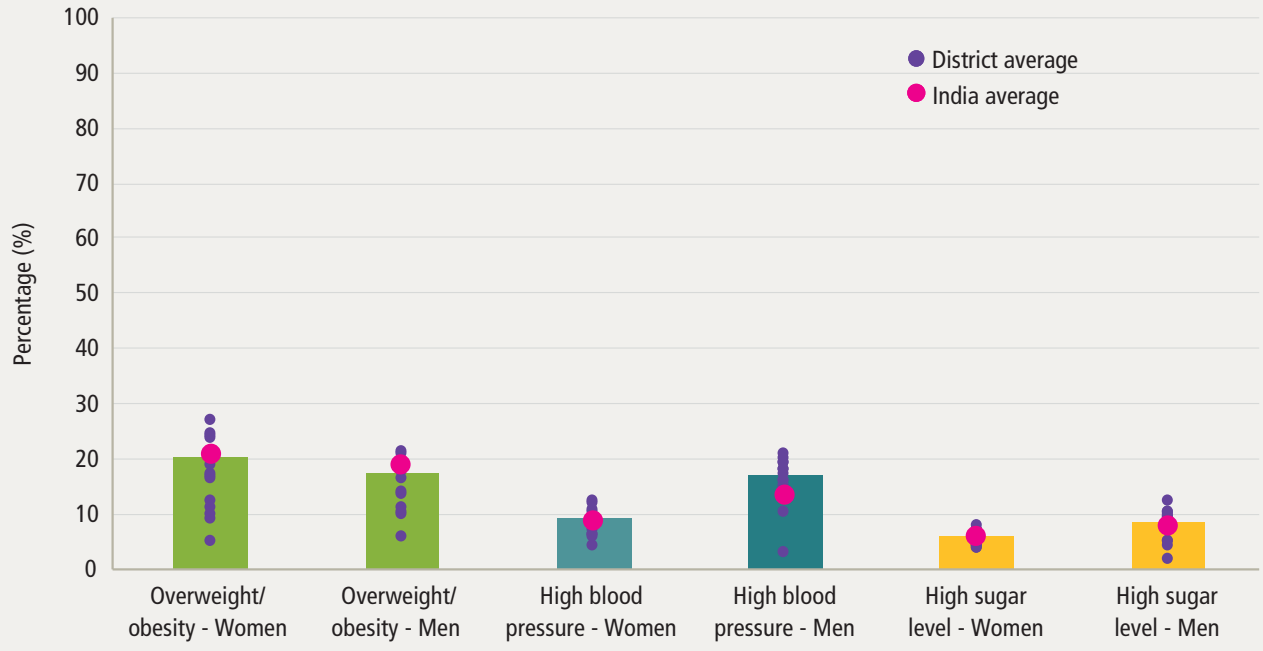
Adequate diet: Percentage of children 6–23 months old who received 4 or more food groups and a minimum meal frequency.

ANC (4 or more visits): Percentage of mothers receiving at least 4 ANCs 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.

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



Source: NFHS-4.

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

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 the age of 5 years whose birth was registered.

Consumed IFA ≥ 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 ≥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 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 ≥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.

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 April 2017. http://censusindia.gov.in/2011census/censusinfodashboard/stock/profiles/en/IND005_Uttarakhand.pdf

Global Targets 2025. World Health Organization. 2014. Accessed April 2017. http://www.who.int/nutrition/global-target-2025/en/

Government of Uttarakhand. Accessed April 2017. http://uk.gov.in/pages/display/115-state-profile

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.shtml

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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Centre for Equity Studies

WRITTEN BY

Neha Kohli, Senior Research Analyst, IFPRI

Phuong Hong Nguyen, Research Fellow, IFPRI

Rasmi Avula, Research Fellow, IFPRI

Lan Mai Tran, Independent Consultant

Purnima Menon, Senior Research Fellow, IFPRI

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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.

CONTACT US

Email us at IFPRI-POSHAN@cgiar.org

IFPRI-NEW DELHI

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

NASC Complex, CG Block,
Dev Prakash Shastri Road,
Pusa, New Delhi 110012, India
T +91.11.66166565
F +91.11.66781699

IFPRI-HEADQUARTERS

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

2033 K Street, NW,
Washington, DC 20006-1002 USA
T. +1.202.862.5600
F. +1.202.467.4439
Skype: IFPRIhomeoffice
ifpri@cgiar.org
www.ifpri.org