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Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India

Policy Note

No. 20 | OCTOBER 2017

# Improving Nutrition in Chhattisgarh

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

### INTRODUCTION

India has made considerable progress in child nutrition outcomes in the last decade. These rates of improvement, however, have been highly variable across the states, mostly due to variabilities 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 Chhattisgarh.

Chhattisgarh was established in November 2000, following the reorganization of the state of Madhya Pradesh. Its land area makes it the 10th largest state in the country, and its population of 25.5 million people makes it the country's 16th most populated state. Chhattisgarh has a population density of 189 people per square kilometer, and a sex ratio of 991 females per 1000 males. The literacy rate in the state is 70 percent (Government of Chhattisgarh 2017).

The purpose of this *Policy Note* is to examine the trends in undernutrition in Chhattisgarh and to document trends and regional 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 Chhattisgarh.

### METHODS

We used summary data from the recently released National Family Health Survey-4 (NFHS-4 2015–16) factsheets (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 factsheets 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 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 18 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 (Black et al. 2013). For intervention coverage, we chose a set of nutrition-specific interventions across the

lifecycle, including interventions affecting pregnant women, newborn babies, infants and children.

## FINDINGS

### Trends in nutrition outcomes and variability in outcomes by district

Changes in nutrition and health outcomes have been mixed in Chhattisgarh between 2006 and 2016 (Figure 1). Stunting prevalence among children under five years declined from 52.9 percent to 37.6 percent. Anemia among women of reproductive age declined 10.5 percentage points, from 57.5 percent to 47 percent in the last decade. Low birth weight reduced marginally from 17.5 percent to 16.9 percent. Exclusive breastfeeding (EBF) for children under six months was high in 2006 at 82 percent, but decreased to 77.2 percent in 2016. Wasting increased from 19.5 percent to 23.1 percent, and severe wasting increased from 5.6 percent to 8.4 percent in the same period (IIPS 2008 and IIPS 2017).

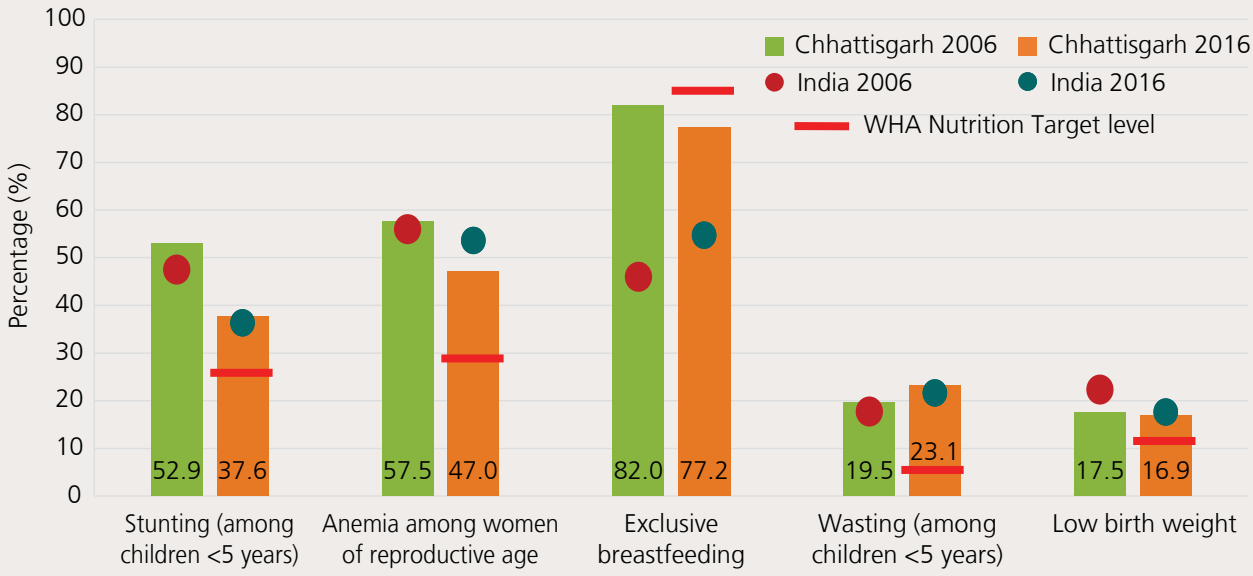
With regard to variability within the state, stunting among children under five years of age varies moderately across districts, ranging from 30.6 percent in Koriya to 49 percent in Narayanpur (Map 1). Stunting rates are high (30 to <40 percent) in 11 of the 18 districts and very high (≥ 40 percent) in 7 districts. Anemia among women of reproductive age also varies considerably among districts (Map 2), with higher prevalence in some districts in the south of the state. Anemia rate is lowest in Kabirdam (34.9 percent) and highest in Dakshin Bastar Dantewada (74.5 percent). In 12 districts, more than 40 percent of the women are anemic.

Every district in Chhattisgarh has wasting levels higher than 15 percent (rated as very high) (Map 3). Rajnandgaon district has the lowest level of wasting (17.2 percent) and Bastar has the highest (33.9 percent). On severe wasting (Map 4), Kabirdham has the lowest rate at 4.3 percent and Narayanpur has the highest at 16.2 percent. Map 5 presents district variability on the coverage of EBF across the state. A majority of districts have EBF rate of more than 70 percent except for Durg (52.9 percent), Janjgir Champa (67.4 percent) and Bastar (68.5 percent). Kabirdham has the highest coverage of EBF at 84.9 percent.

### Changes in the determinants of nutrition

Improving nutrition for women and children requires that investments be made in changing

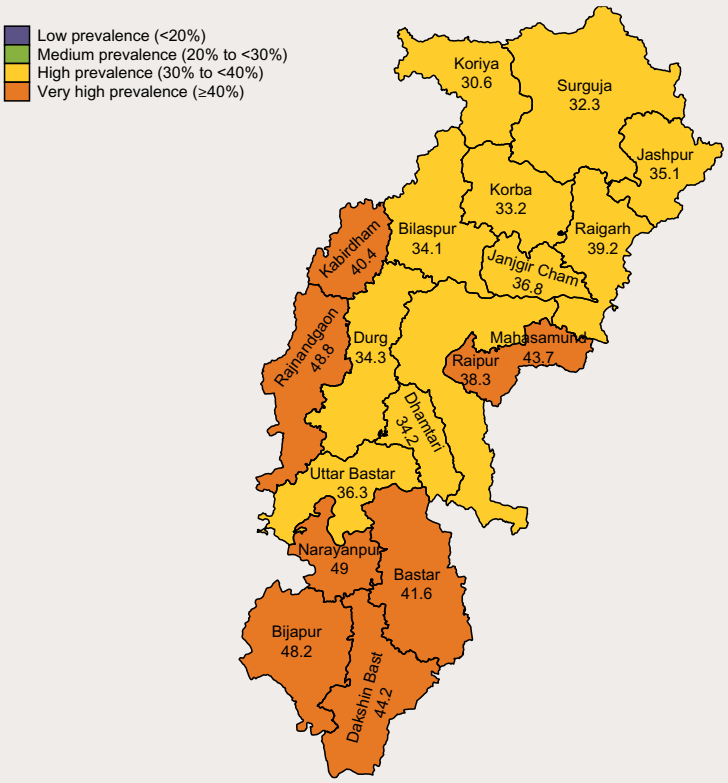
FIGURE 1 Trends in nutrition outcomes in Chhattisgarh, 2006 to 2016




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

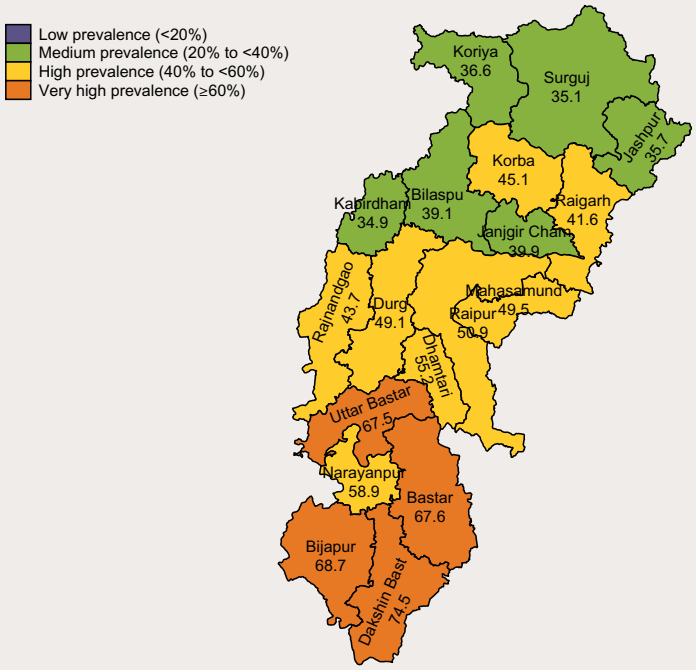
**Note:** A set of global nutrition targets for maternal, infant and young child nutrition were endorsed by the World Health Assembly (WHA) in 2012. The red lines represent the WHA targets to be achieved by the state, by 2025. The baseline reference year for these targets is 2012. The state baseline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



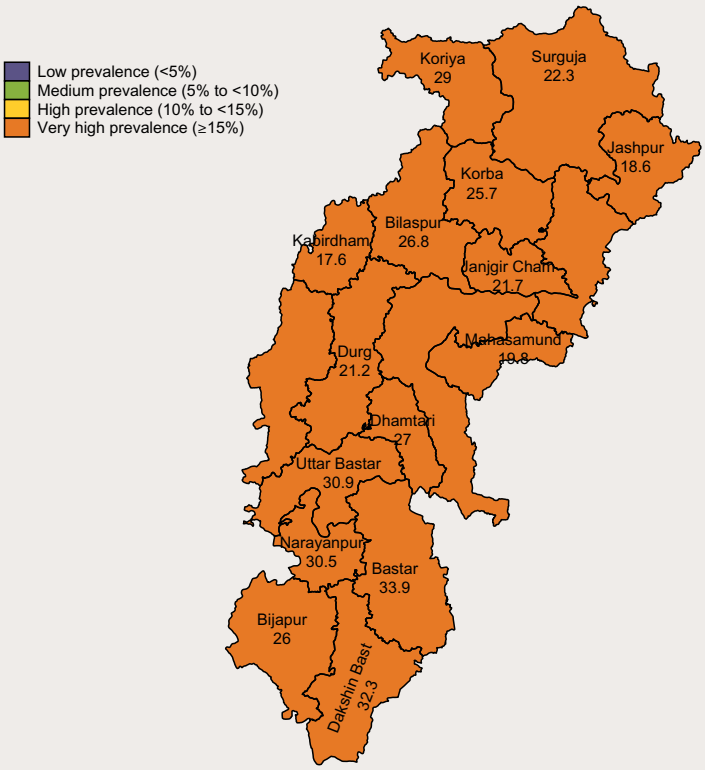

**Source:** NFHS-4.

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



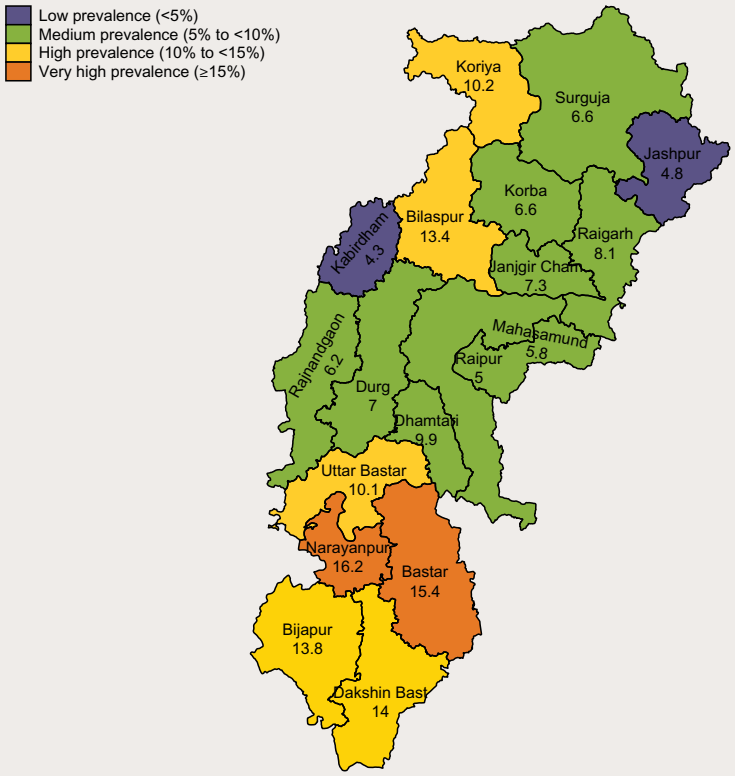

**Source:** NFHS-4.

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



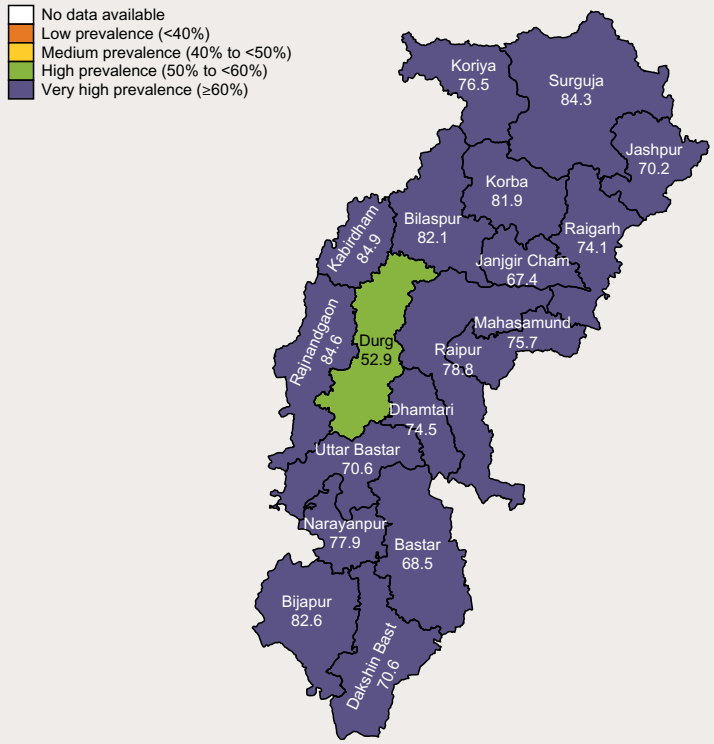

**Source:** NFHS-4.

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




**Source:** NFHS-4.

## MAP 5 Exclusive breastfeeding in Chhattisgarh in 2016, by district




**Source:** NFHS-4.

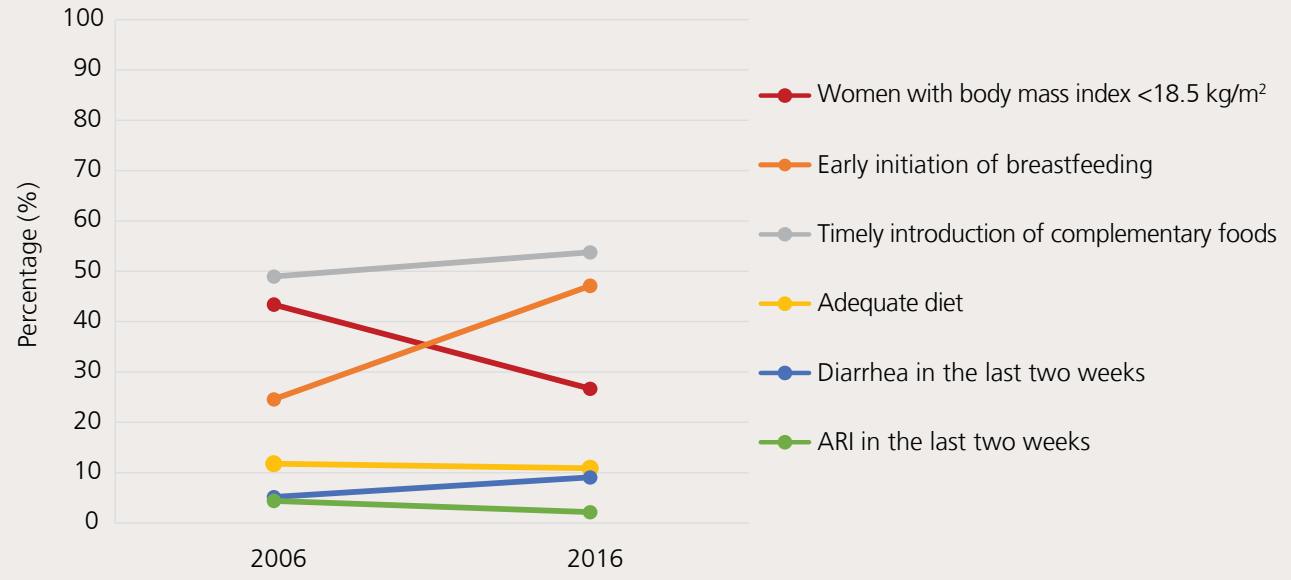
the determinants of poor nutrition, using a variety of policy instruments and other efforts. We now examine changes in the immediate determinants of nutrition and the nutrition-specific interventions that address these. We also describe changes in the underlying determinants of nutrition. We do not examine coverage data on programs to improve the underlying determinants in this Note because data are not available at this time.

Changes in the ***immediate determinants of nutrition*** are described in Figure 2. Early initiation of breastfeeding nearly doubled (from 24.6 percent to 47.1 percent), and the proportion of women with body mass index less than 18.5 kg/m$^2$ decreased from 43.4 percent to 26.7 percent. Timely introduction of foods for children between 6 and 8 months of age also increased from 49 percent in 2006 to 53.8 percent in 2016. However, only 10.9 percent of children (between 6 and 23 months of age) received an adequate diet. Disease burden in the last ten years portrays a mixed picture. Diarrhea prevalence increased from 5.2 percent to 9.1 percent while acute respiratory infection (ARI) reduced to half (from 4.4 percent to 2.2 percent).

The coverage of all ***nutrition-specific interventions*** in Chhattisgarh improved during the last decade (Figure 3). During pregnancy, the proportion of women who received antenatal care (ANC) during the first trimester increased from 46 percent to 70.8 percent. The proportion of women who received four or more ANC visits increased from 28.3 percent to 59.1 percent. Although the proportion of women reporting the consumption of iron and folic acid (IFA) supplements for 100 days or more increased nearly three-fold (from 10.3 percent to 30.3 percent), it is still far from optimal. Mothers who were immunized against tetanus during the prenatal period increased from 74.6 percent to 94.3 percent.

Interventions related to delivery have also improved over the last decade. The proportion of women who had institutional deliveries increased substantially from 14.3 percent to 70.2 percent. The proportion of skilled birth attendants rose from 41.6 percent to 78 percent, and births registered increased from 73 percent to 86.1 percent.

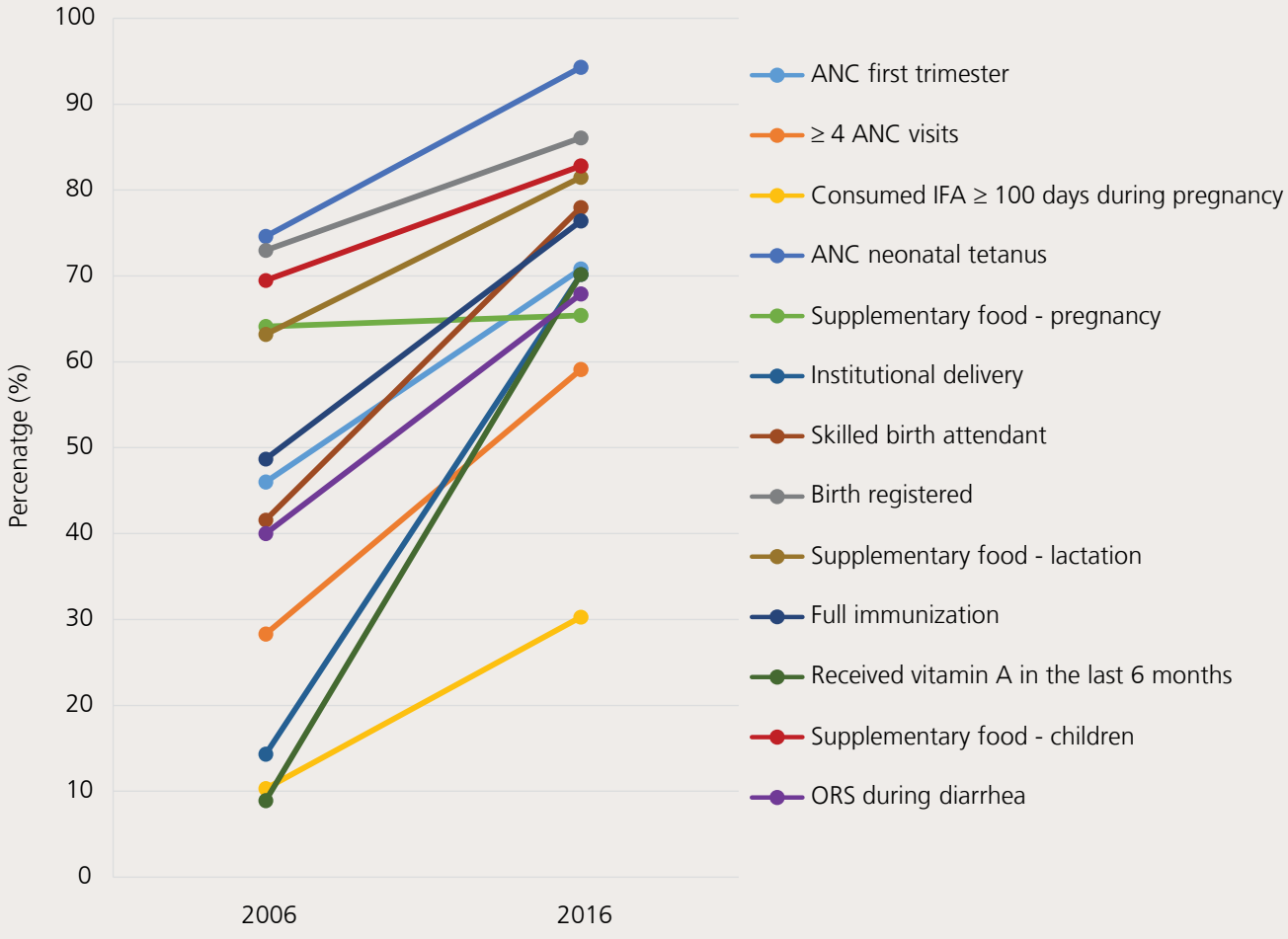
## FIGURE 2 Changes in immediate determinants of nutrition in Chhattisgarh, 2006 to 2016




**Source:** NFHS-3 and NFHS-4.

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

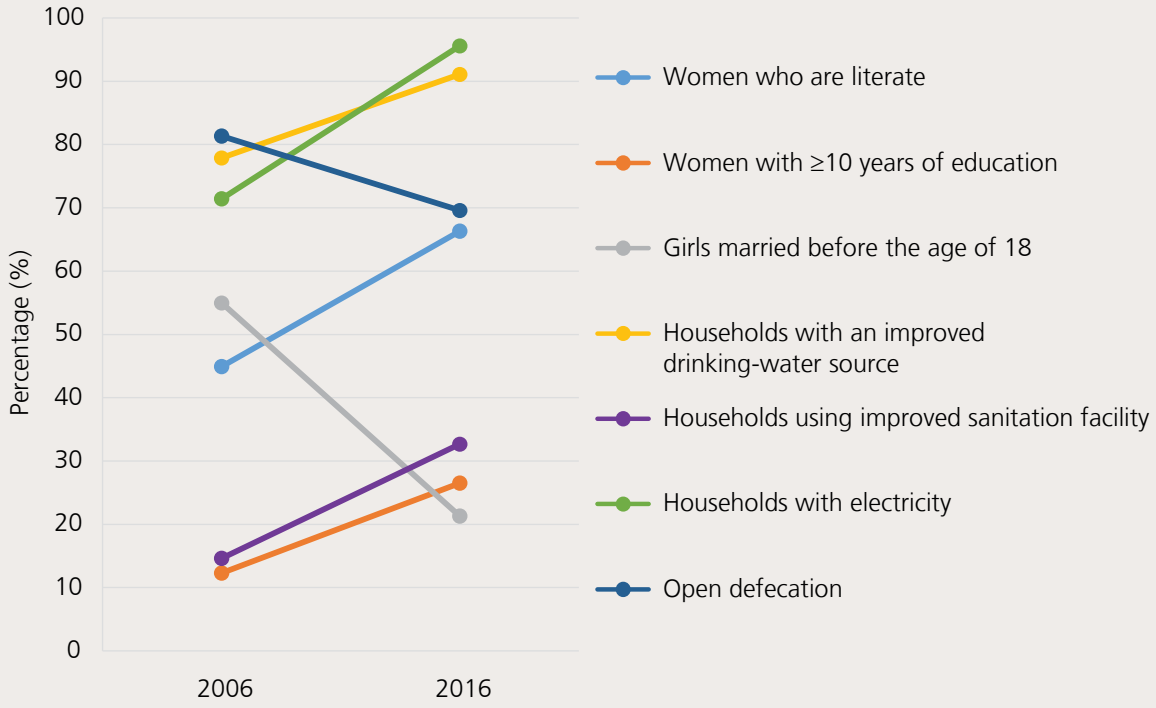
## FIGURE 3 Changes in coverage of nutrition-specific interventions along the continuum of care in Chhattisgarh, 2006 to 2016




**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 Chhattisgarh, 2006 to 2016




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

**Note:** Refer to endnotes for indicator definitions.

Nutrition interventions focused on children have improved in the last ten years. Full immunization rose from 48.7 percent to 76.4 percent. Coverage of vitamin A supplements improved remarkably from 8.9 percent to 70.2 percent. The proportion of children reported to have received oral rehydration salts (ORS) during diarrhea increased from 40 percent to 67.9 percent.

Receipt of supplementary food from the Integrated Child Development Services improved by 13 to 18 percentage points for lactating women and children, reaching above 80 percent in 2016, but only increased marginally for pregnant women (from 64.1 percent to 65.4 percent).

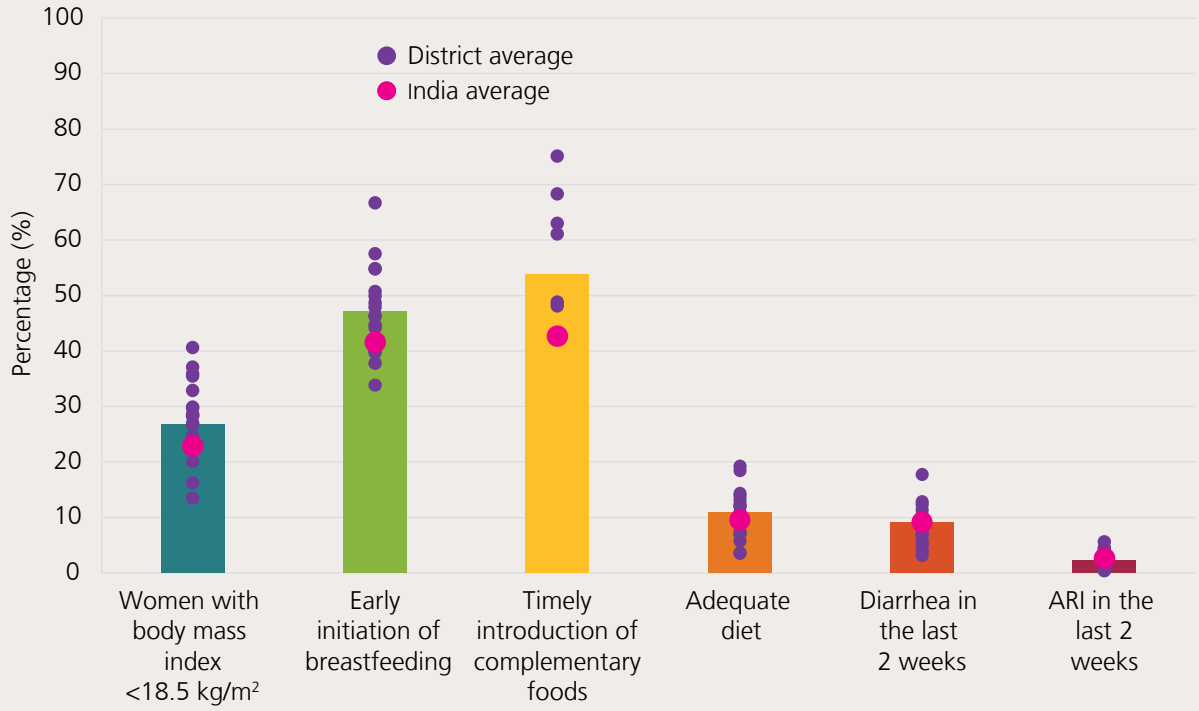
In the last decade, there was progress across most underlying determinants of nutrition in Chhattisgarh (Figure 4). Literacy among women increased from 44.9 percent in 2006 to 66.3 percent in 2016, and the proportion of women with ten or more years of education increased from 12.3 percent to 26.5 percent. Underage marriage decreased by 33.7 percentage points from 55 percent to 21.3 percent during this period.

There was an increase in the proportion of households with an improved drinking water source (from 77.9 percent to 91.1 percent), electricity (from 71.4 percent to 95.6 percent) and using improved sanitation facilities (from 14.6 percent to 32.7 percent) between 2006 and 2016. Accordingly, open defecation in the state decreased from 81.3 percent to 69.6 percent.

## Inter-district variability in selected determinants and coverage of interventions in Chhattisgarh in 2016

In Figures 5, 6, and 7, we highlight the district variability in immediate determinants (Figure 5), coverage of health and nutrition interventions (Figure 6) and underlying determinants (Figure 7). Among the 18 districts of Chhattisgarh, there is a high degree of inter-district variability for many key determinants (low body mass index among women, 4 or more ANC to pregnant women, institutional delivery, newborn check-up, full immunization, ORS treatment during diarrhea, households using improved sanitation). In contrast, there is little inter-district variability for some other determinants where the levels are high across majority of districts (mother and child protection card, neonatal tetanus, and household access to electricity).

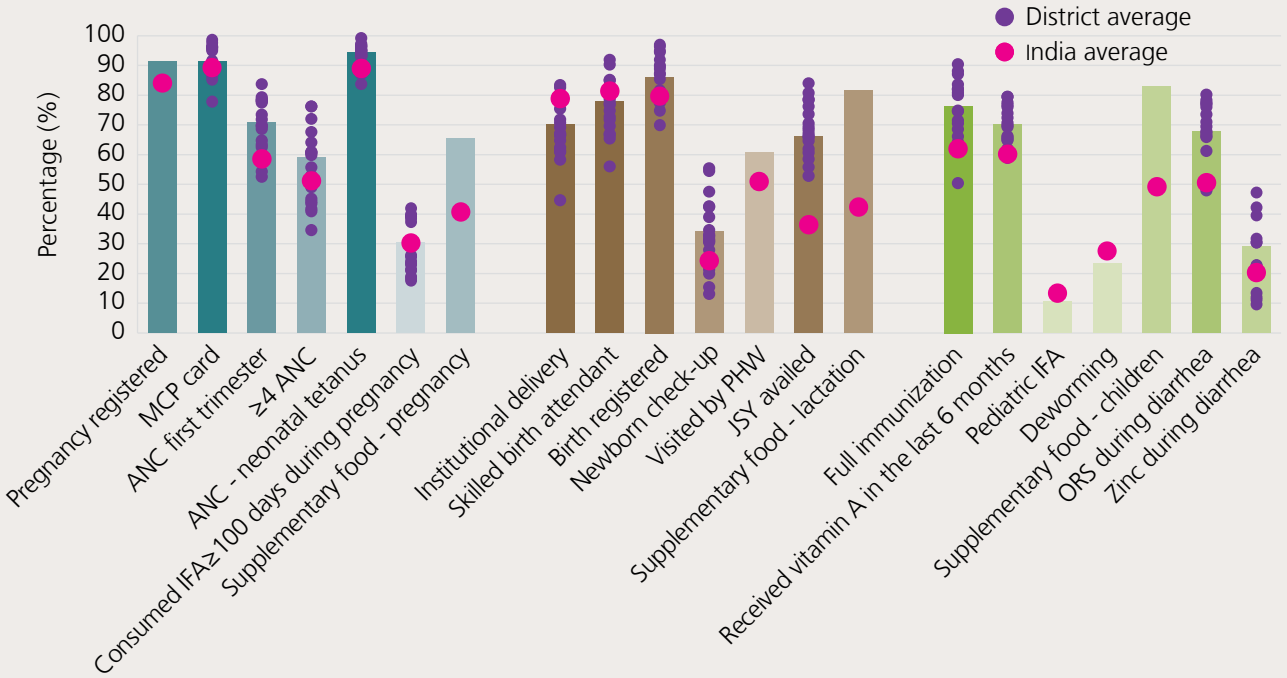
## FIGURE 5 Inter-district variability in immediate determinants in Chhattisgarh, in 2016




**Source:** NFHS-4.

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

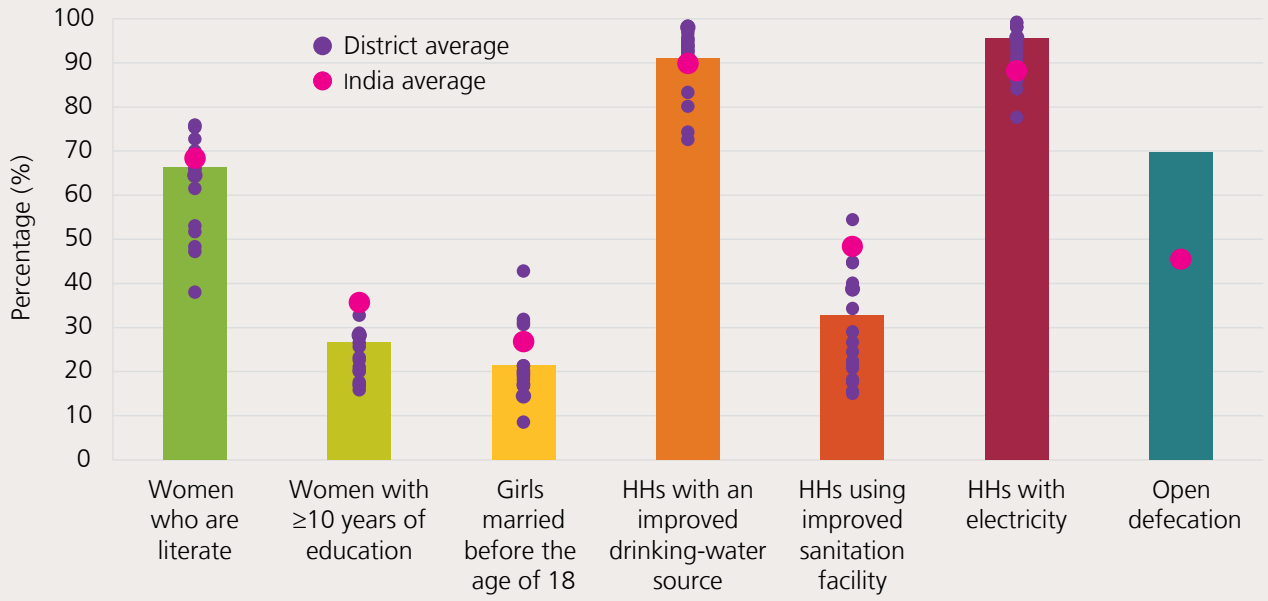
## FIGURE 6 Inter-district variability in coverage of selected interventions in Chhattisgarh, in 2016




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

**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 Chhattisgarh, in 2016




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

**Note:** Bars represent state averages; HH= Household; Refer to endnotes for indicator definitions.

For some indicators like early initiation of breastfeeding, timely introduction of complementary foods, ANC, newborn check-up, full immunization, vitamin A supplementation and ORS treatment during diarrhea, almost all the districts of Chhattisgarh are doing better than the national average. For a few other indicators, some districts of Chhattisgarh are nearly at par with the national average (adequate diet, MCP card etc.). Households using improved sanitation facility is one of the few indicators where the Chhattisgarh average is lower than the national average.

## LOOKING FORWARD: IMPLICATIONS & RECOMMENDATIONS

Considering India's commitments to global nutrition targets, this is an opportune time for Chhattisgarh to set its own nutrition targets to be achieved by 2025. These will help the state examine its own progress within and across the state, and accelerate actions necessary to improve all forms of malnutrition.

Chhattisgarh has seen considerable improvements across nutrition determinants and intervention coverage in the last 10 years. However, some challenges persist in the state, particularly the increased prevalence in wasting (from 19.5 percent in 2006 to 23.1 percent in 2016). Special efforts are required to understand and reverse the increased trend in the prevalence of wasting, which is more than 15 percent in all the districts. Although anemia levels have reduced, the condition still affects nearly half of the women in the state. Chhattisgarh now needs to put in place a strategy that considers all forms of malnutrition captured in the WHA indicators (Figure 1).

To achieve progress on undernutrition, Chhattisgarh should continue investments in improving the coverage of interventions targeting the first 1000 days of life. During the prenatal phase, emphasis is required on increasing the current low coverages of IFA consumption (30 percent). Additional investments are also needed to improve 4 or more ANC visits and supplementary food to pregnant women, both of which are far from universal. It is also important to sustain the considerable progress achieved on institutional delivery and skilled birth attendants.

Significant investments are needed to strengthen the coverage of several postnatal interventions, particularly infant and young child feeding practices where only 11 percent of children received an adequate diet. Around half the children have not received optimal feeding practices such as early initiation of breastfeeding and timely introduction of complementary foods. For other postnatal care, such as full immunization and vitamin A supplementation,

Chhattisgarh has made good progress– the state should ensure, sustain and strengthen these achievements. The state also needs to address the increase of diarrhea among children over the decade, and improve pediatric IFA and deworming of children, which is currently below the national average.

On underlying determinants, there have been improvements. However, significant efforts are needed in the area of sanitation as only 32.7 percent of households use improved sanitation facilities and 70 percent of the state's population still engages in open defecation.

It is crucial for Chhattisgarh to focus on the emerging challenge of non-communicable diseases, alongside making investments in early nutrition. Over 10 percent of adult men and women in the state are overweight or obese. As Figure 8 below shows, the challenges related to high blood sugar and high blood pressure are also fast growing, highlighting the pressing need to simultaneously address undernutrition and these emerging non-communicable diseases related to nutrition.

## NOTE

1. Chhattisgarh currently consists of 27 districts. Since National Family Health Survey-4 used the Census 2011 district boundaries, this Policy Note reports information for only 18 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.

**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).

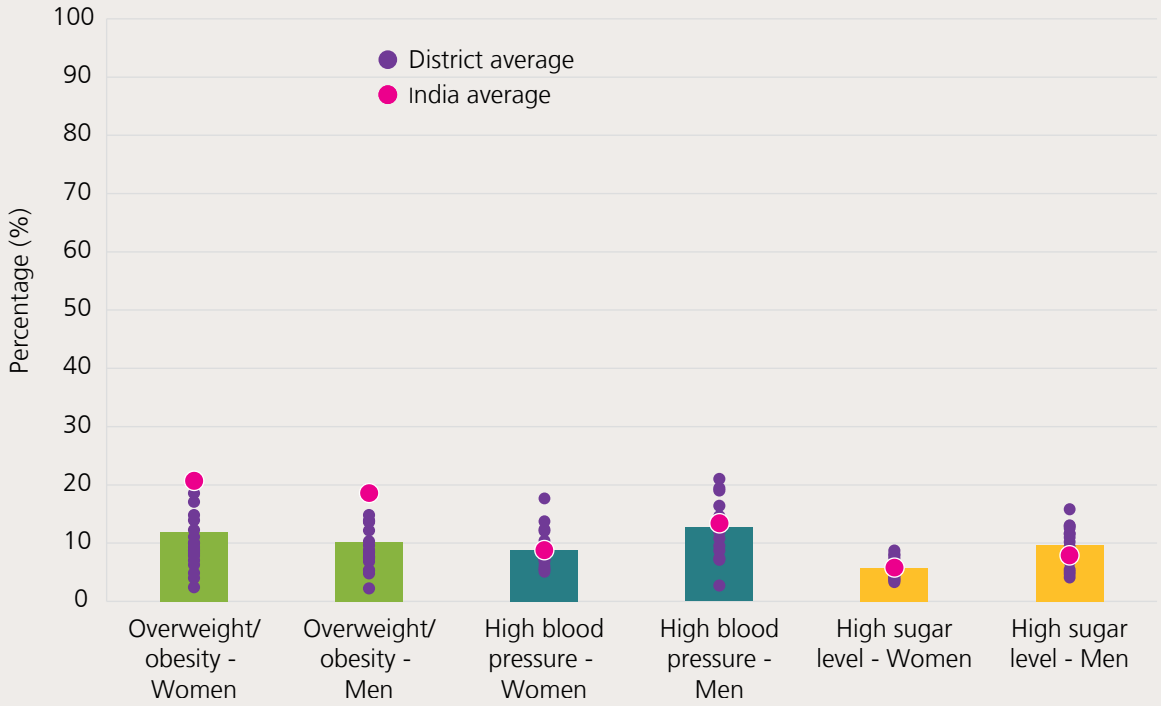
**Birth registered:** Percentage of children under age 5 years whose birth was registered.

**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.

FIGURE 8 Levels of non-communicable diseases in Chhattisgarh, in 2016




**Source:** NFHS-4.

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

**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 year old men and women with systolic ≥140 mm of Hg and/or diastolic ≥90 mm of Hg.

**High blood sugar:** 15–49 year 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 birthweight:** 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 year 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 2011. Accessed April 2017. http://censusindia.gov.in/2011census/censusinfodashboard/stock/profiles/en/IND027_Chhattisgarh.pdf.

Chhattisgarh District Fact Sheets. NFHS-4 (National Family Health Survey-4), International Institute for Population Studies. 2016. Accessed April 2017. http://rchiips.org/nfhs/CT.shtml.

Chhattisgarh Fact Sheet. NFHS-4 (National Family Health Survey-4), International Institute for Population Studies. 2017. Accessed April 2017. http://rchiips.org/NFHS/pdf/NFHS4/CT_FactSheet.pdf.

Chhattisgarh Population Census data 2011: History. Census Population 2015 Data. Accessed May 2017. http://www.census2011.co.in/census/state/Chhattisgarh.html.

Chhattisgarh– key facts. 11. Department of Public Relations, Government of Chhattisgarh. 2017. Accessed May 2017. http://dprcg.gov.in/content.

Chhattisgarh State Government. Accessed May 2017. https://www.Chhattisgarh.gov.in/.

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

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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## SUGGESTED CITATION

Please cite this Note as: George, N.R.,P.H. Nguyen, R. Avula, and P. Menon. 2017. *Improving Nutrition in Chhattisgarh: Insights from Examining Trends in Outcomes, Determinants and Interventions between 2006 and 2016.* POSHAN Policy Note 20. New Delhi: International Food Policy Research Institute.

## ACKNOWLEDGEMENTS

Financial support for this Policy Note was provided by the Bill & Melinda Gates Foundation through POSHAN, led by the International Food Policy Research Institute. The funder played no role in decisions about the scope of the analysis or the contents of this Note. We thank Abhilasha Vaid (IFPRI) for her help in reviewing this Note.

## 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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