POSHAN
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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 Rajasthan

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 states. This *Policy Note* focuses on Rajasthan.

Rajasthan, situated in the north-western part of India, accounts for 10.4 percent of the area of the country and includes 33 districts (Government of Rajasthan 2017). Rajasthan is home to more than 68 million people (6 percent of the population of India), of which 66.11percent are literate (Census of India 2011). The state has a sex ratio of 888 females per 1,000 males (Census of India 2011).

The purpose of this *Policy Note* is to examine the trends in under nutrition in Rajasthan and to document the 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 Rajasthan.

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 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 the 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

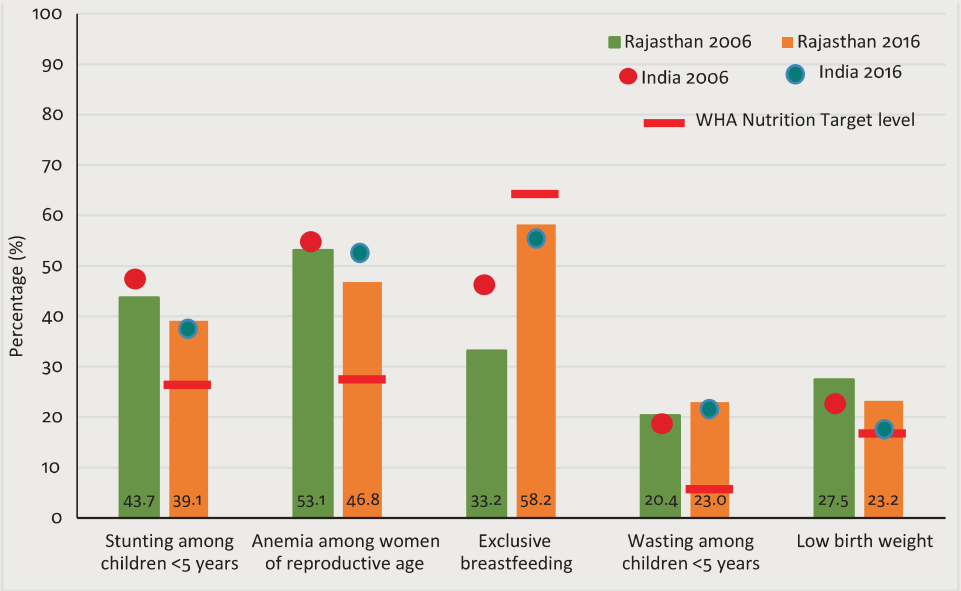
Trends in nutrition outcomes and variability in outcomes by district

There have been improvements in nutrition and heath outcomes among children in Rajasthan between 2006 and 2016 (Figure 1). Stunting prevalence declined from 43.7 percent in 2006 to 39.1 percent in 2016. Even though anemia among women of reproductive age declined from 53.1 percent to 46.8 percent during 2006-16, nearly a half of the women still suffer from anemia. The state has performed well on exclusive breastfeeding, which increased from 33.2 percent in 2006 to 58.2 percent in 2016. Of most concern is wasting, which increased from 20.4 percent in 2006 to 23 percent in 2016. Severe wasting also increased from 7.3 percent to 8.6 percent during the same time period. The prevalence of low birth weight declined slightly from 27.5 percent in 2006 to 23.2 percent in 2016.

While stunting among children less than five years is high in a majority of districts of Rajasthan, it varies widely across districts, ranging from 54.3 percent in Dhaulpur to 28.4 percent in Sikar (Map 1). In 12 out of 33 districts, more than 40 percent of children are stunted, which indicates a significant public health concern. Anemia prevalence also varies greatly in the state, ranging from 76.3 percent (Banswara) to 27.1 percent (Jaipur and Dausa) (Map 2). In two-thirds of districts in Rajasthan, more than 40 percent of the women of reproductive age are anemic. The prevalence of wasting (Map 3) is very high in 29 out of 33 districts; it is highest in Pratapgarh (38.2 percent) and lowest in Sikar (11.5 percent). Sikar district has the lowest prevalence of severe wasting (4.1 percent) and Dungarpur, the highest (16.1 percent) (Map 4).

The prevalence of exclusive breastfeeding in Rajasthan ranges from 34.9 percent to 91.3 percent (Map 5). In 21 districts, exclusive breastfeeding prevalence is higher than 50 percent. Data on exclusive breastfeeding for Bhilwara district in Rajasthan is missing because the district-specific sample sizes for age sub-groups are too small.

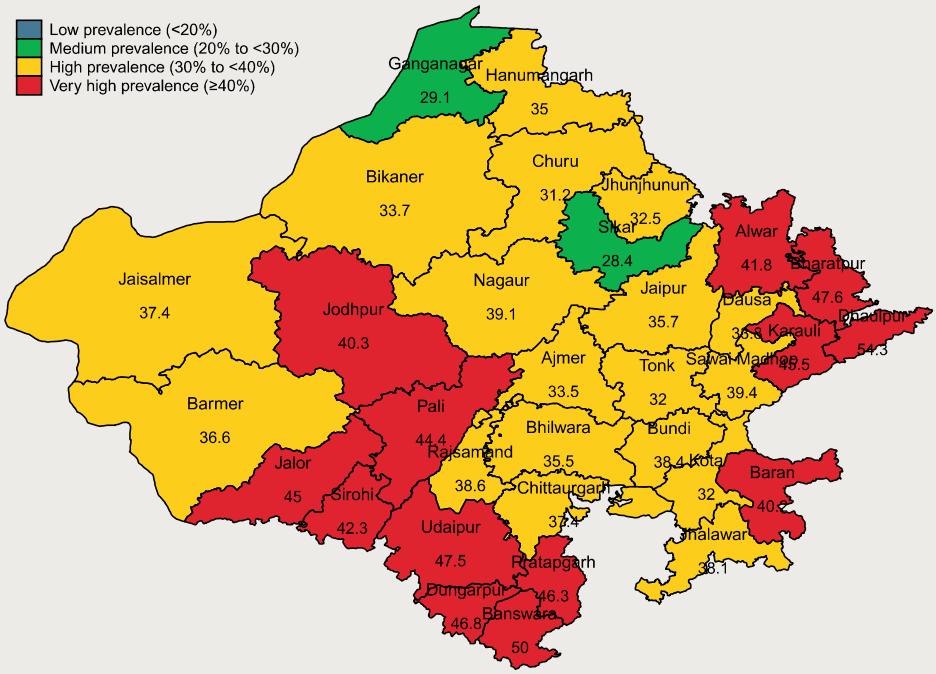
FIGURE 1 Trends in nutrition outcomes in Rajasthan, 2006 to 2016



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

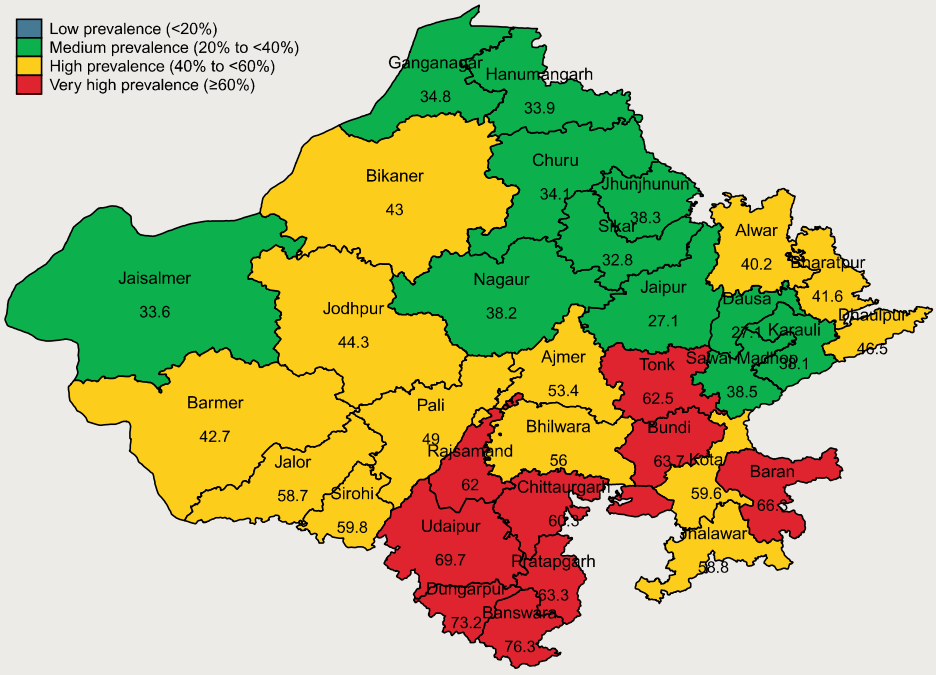
Note: A set of global nutrition targets for maternal, infant and young child nutrition were endorsed by the World Health Assembly (WHA) in 2012. The red lines represent the WHA targets to be achieved by the state, by 2025. The baseline reference year for these targets is 2012. The state baseline estimates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



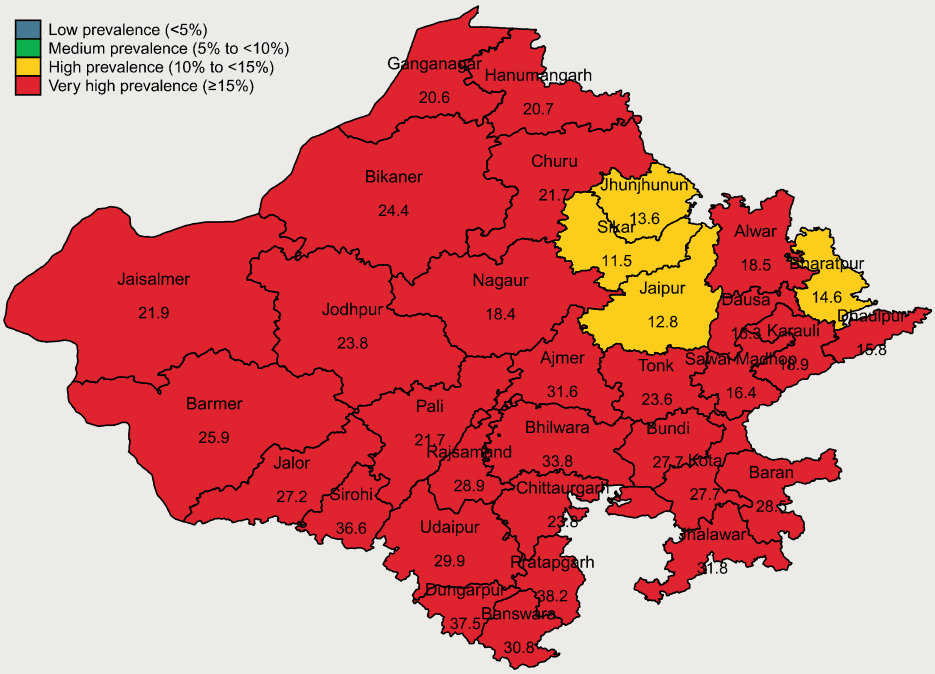
Source: NFHS-4.

MAP 2 Anemia (among children <5 years) in Rajasthan in 2016, by district



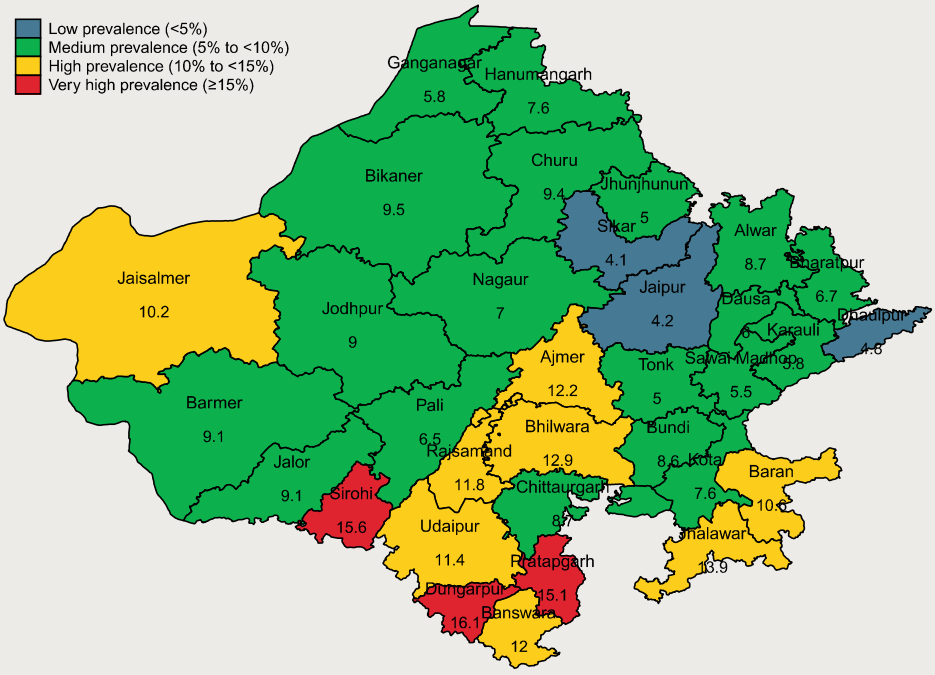
Source: NFHS-4.

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



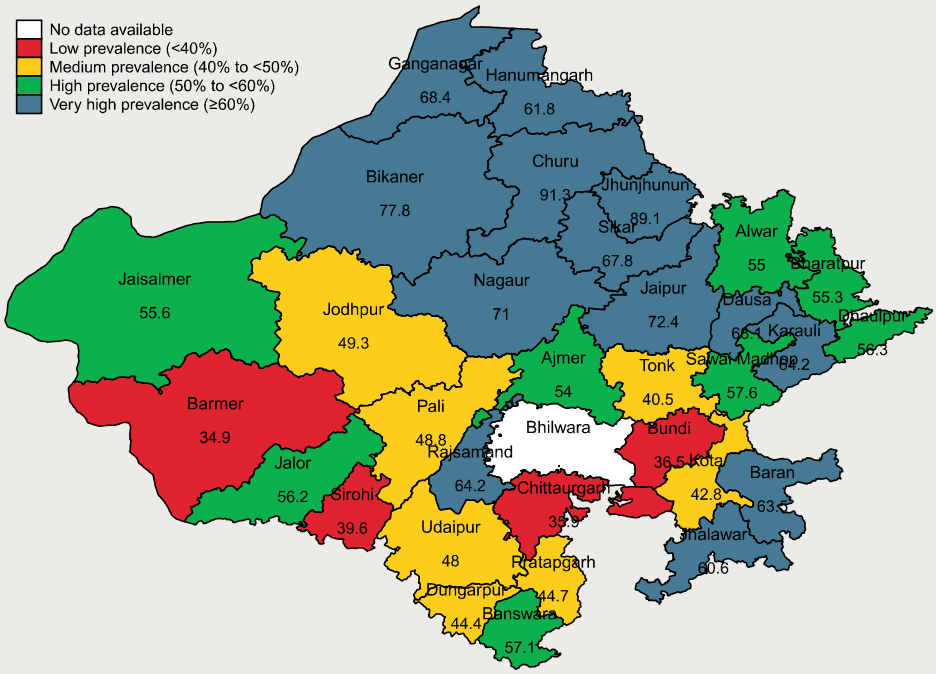
Source: NFHS-4.

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



Source: NFHS-4.

MAP 5 Exclusive breastfeeding in Rajasthan in 2016, by district



Source: NFHS-4.

Changes in the determinants of nutrition

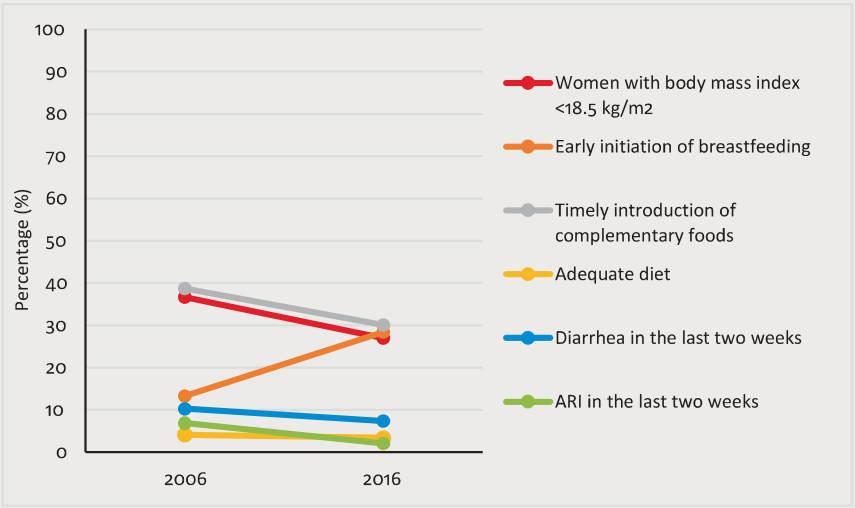
Improving nutrition for women and children requires that investments be made in changing the determinants of poor nutrition, using a variety of policy instruments and other efforts. Here we examine changes in the immediate determinants and of nutrition-specific interventions to address those determinants.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

Changes in the ***immediate determinants*** of nutrition in Rajasthan are described in Figure 2. There has been some improvement in the immediate determinants of nutrition in Rajasthan. The proportion of women with low body mass index (BMI<18.5 kg/m^2) declined from 36.7 percent to 27 percent during 2006-16. Although early initiation of breastfeeding increased from 13.3 percent to 28.4 percent during this period, less than a third of children are breastfed within one hour of birth. Of greatest concern is complementary feeding - timely introduction of complementary foods (between 6 and 8 months of age) declined over the last decade (from 38.7 percent to 30.1 percent) and in 2016, only 3.4 percent of children (between 6 and 23 months of age) received an adequate diet.

The disease burden has improved in Rajasthan over the past decade. The proportion of children with diarrhea decreased from 10.3 percent to 7.4 percent from 2006 to 2016 and the proportion of children with acute respiratory infection declined from 6.9 percent to 2.1 percent for the same time period.

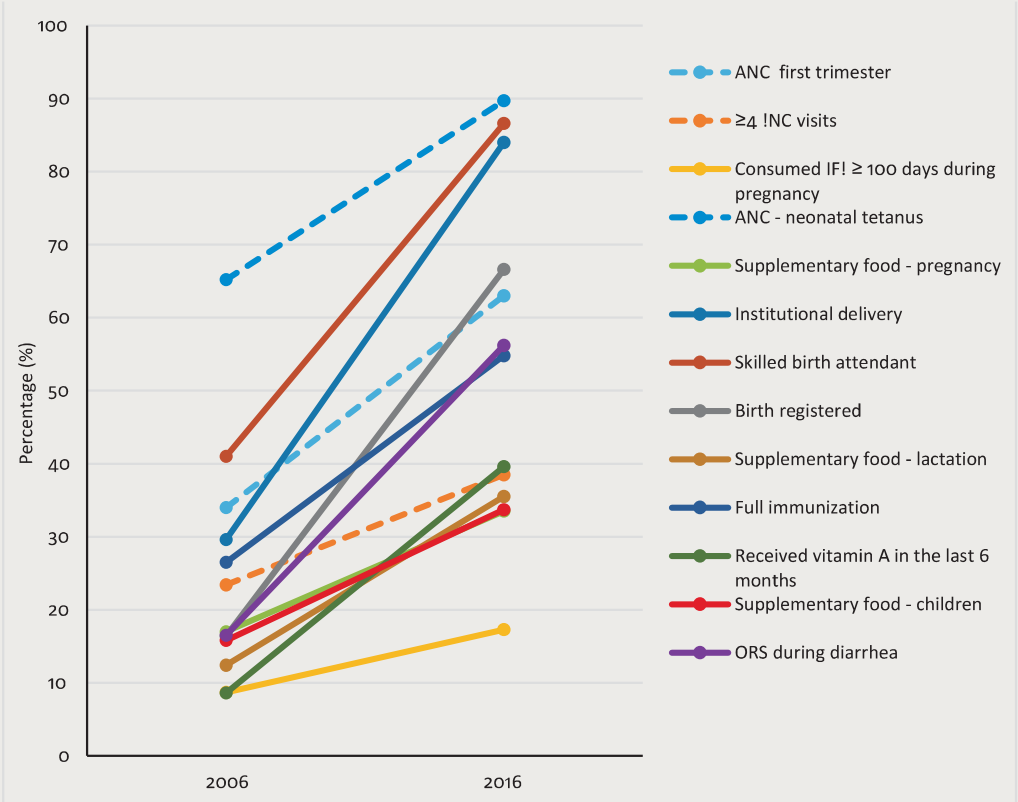
Changes in ***nutrition-specific interventions*** in Rajasthan are presented in Figure 3. The proportion of women who received an antenatal care (ANC) visit in the first trimester almost doubled from 34 percent in 2006 to 63 percent in 2016 and the proportion of women who received more than four antenatal visits increased from 23.4 percent to 38.5 percent in the same time period. However, the proportion of women reporting consumption of

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



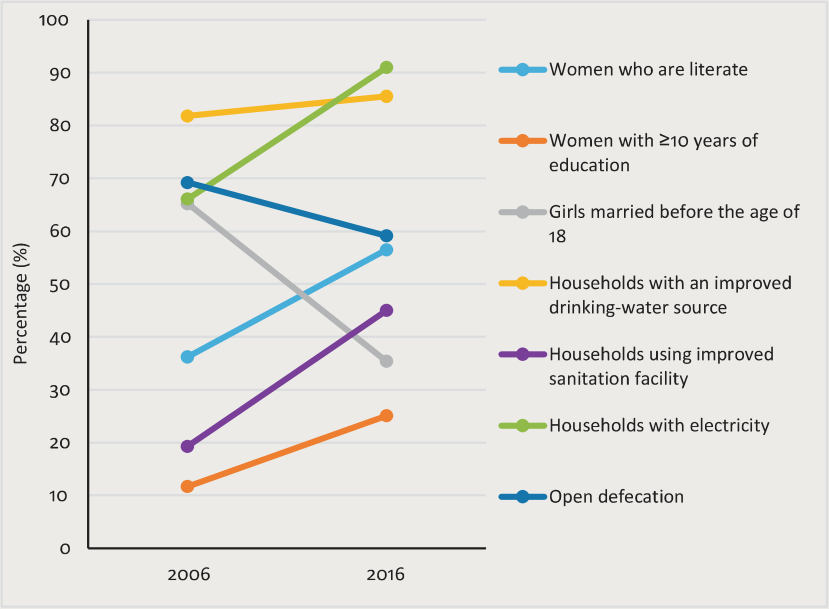
Source: NFHS-3 and NFHS-4
Note: ARI= Acute respiratory infection; Refer to endnotes for indicator definitions.

FIGURE 3 Changes in immediate determinants of nutrition in Rajasthan, 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 Rajasthan, 2006 to 2016



Source: NFHS-3 and NFHS-4; RSoC data used for open defecation.
Note: Refer to endnotes for indicator definitions.

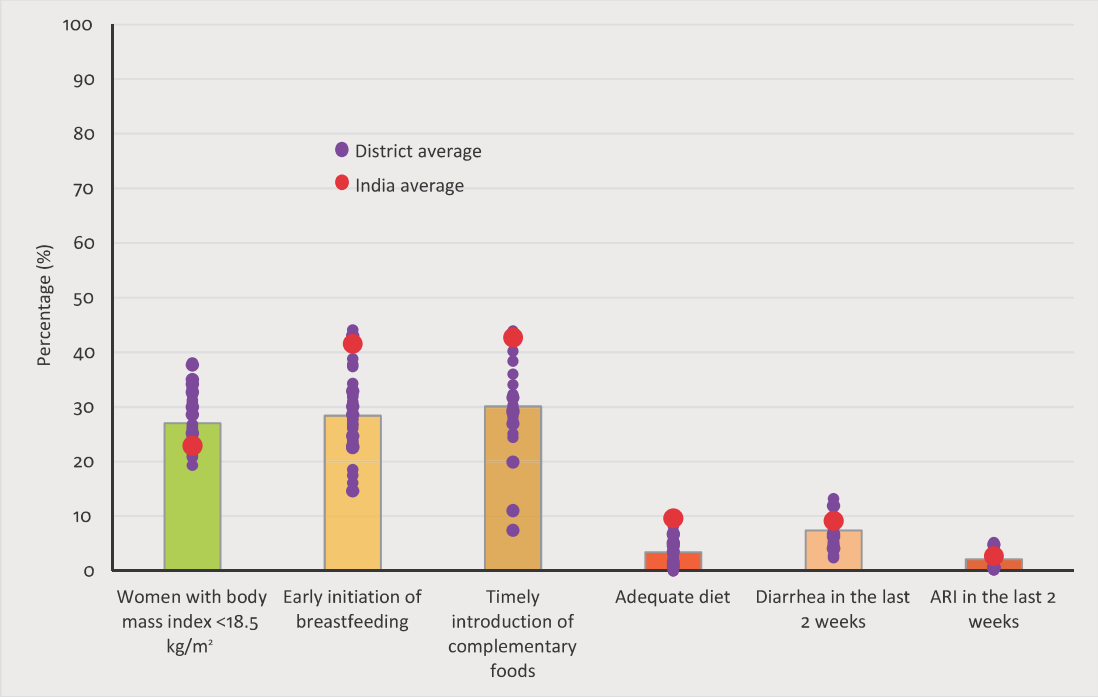
iron-folic acid (IFA) supplements increased moderately from 8.7 percent in 2006 to 17.3 percent in 2016 but it is still very low. Interventions related to delivery, such as institutional delivery and births assisted by health professionals, improved dramatically in the last decade with 46 to 55 percentage points increase, reaching above 80 percent in 2016. Nutrition interventions focused on children have also improved in the last ten years. The coverage of vitamin A supplementation increased from 8.6 percent to 39.6 percent. Even though the proportion of children who were fully immunized increased (from 26.5 percent to 54.8 percent), more than 40 percent of children did not receive all the requisite vaccinations in 2016. Children who received ORS during diarrhea increased substantially from 16.5 percent in 2006 to 56.2 percent in 2016. Between 2006 and 2016, the coverage of food supplementation improved among pregnant women (from 17 percent to 33.5 percent), lactating mothers (from 12.4 percent to 35.5 percent) and children (from 15.8 percent to 33.7 percent).

In the last decade, there were several improvements in the ***underlying determinants of nutrition*** (Figure 4). Households with electricity increased from 66.1 percent to 91 percent. Households with an improved drinking-water source didn't change much in the last ten years but levels have been over 80 percent since 2006. There was a rise in households using improved sanitation facility (from 19.3 percent to 45 percent) but over 50 percent of the households still do not use improved sanitation facilities and open defecation rates remain high at 59.1 percent in 2016. Determinants related to gender have also improved in the last ten years. There was a rise in women's literacy (from 36.2 percent to 56.5 percent) and the proportion of women with more than 10 years of education (from 11.7 percent to 25.1 percent). There was also a remarkable decline in the proportion of girls who were married before the age of 18 years (from 65.2 percent to 35.4 percent) but further improvement is essential.

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

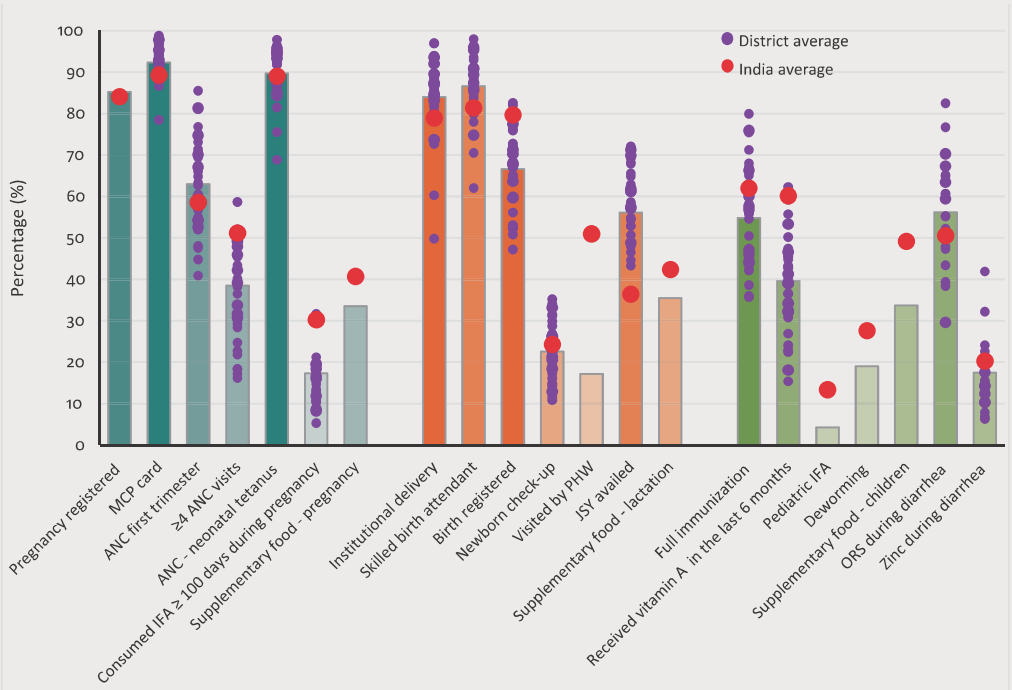
The 33 districts for which NFHS-4 data is available for Rajasthan cover a range of socio-economic characteristics. Among these districts there is a high degree of inter-district variability

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



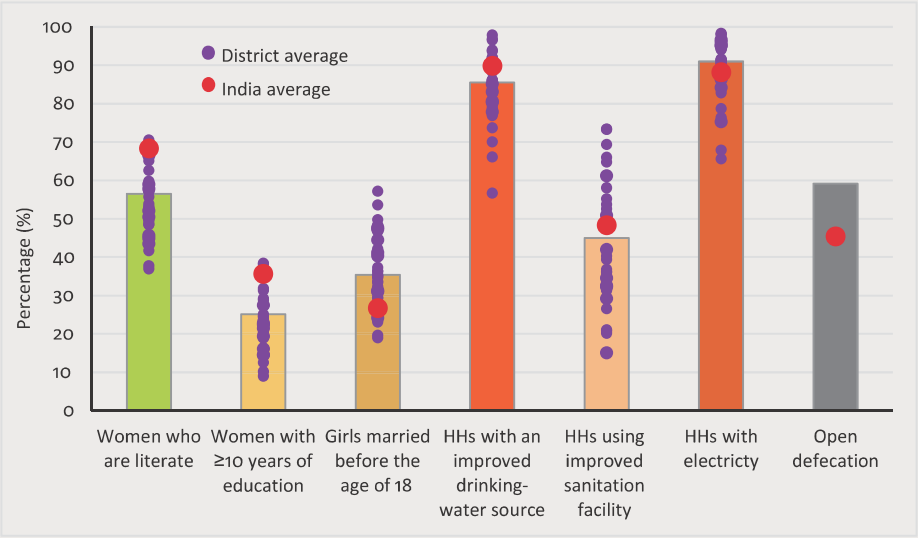
Source: NFHS-4.
Note: Bars represent state averages; ARI= Acute respiratory infection; Refer to endnotes for indicator definitions.

FIGURE 6 Inter-district variability in coverage of selected interventions in Rajasthan, 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 deforming 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 dehydration 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 Rajasthan, in 2016



Source: NFHS-4; RSoC data is used for open defecation.
Note: Bars represent state averages; HHs= Households; Refer to endnotes for indicator definitions.

for most key determinants (that is, infant and young child feeding practices, care during pregnancy and birth, full immunization, vitamin A, diarrhea treatment, girls married before 18 years of age, households with electricity and improved sanitation) (Figures 5-7). In contrast, there is little inter-district variability for some other determinants(for example, MCP card and mothers whose last birth was protected against neonatal tetanus), either because coverage is very high or because challenges are uniform across all the districts (for example, adequate diet among children 6–23 months old is low across all the districts).

For some determinants such as early initiation of breastfeeding, timely introduction of complementary foods and adequate diet, at least 4 ANC visits, IFA consumption, and vitamin A supplementation, most districts in Rajasthan are doing worse than the national average. For other determinants (for example, disease burden among children, newborn check-ups and households with an improved drinking-water source) districts within Rajasthan fall close to the all India average. Most districts in Rajasthan are above the national average on low BMI (BMI <18.5 kg/m^2) among women and the use of Janani Suraksha Yojana (JSY).

LOOKING FORWARD: IMPLICATIONS & RECOMMENDATIONS

In the era of India's commitment to global nutrition targets, it is an opportune time for Rajasthan to set its own nutrition targets to be achieved by 2025, to examine progress within and across the state, and to accelerate actions necessary to improve all forms of malnutrition. The state needs to tackle the issue of child undernutrition as the stunting and wasting prevalence in Rajasthan is high. Special efforts are also needed to improve anemia among women of reproductive age, given nearly half of the women in the state are anemic.

To achieve progress in nutrition, the state should invest in improving the coverage of interventions targeting the first 1000 days of life and continue to invest in sustaining adequate delivery where coverage is already high. On nutrition-specific interventions, remarkable improvements have

taken place for care during delivery. However, emphasis is needed on further strengthening the coverage of antenatal care and increasing IFA consumption (where coverage is currently extremely low).

Significant efforts need to be taken on strengthening the coverage of several postnatal interventions, including immunization, vitamin A supplementation, ORS and zinc for children with diarrhea, where the coverage remains low despite improvements over time. With low coverage and little improvement over the last ten years on infant and young child feeding practices, Rajasthan needs to invest in significant efforts to promote and support optimal feeding practices, particularly early initiation of breastfeeding and adequate complementary feeding. On underlying determinants, even though several improvements have taken place, efforts towards achieving greater levels of women's education, reducing early marriage in girls, and sanitation still need attention.

Alongside investments in early nutrition, it is also important for Rajasthan to consider the challenge of non-communicable diseases. As Figure 8 below shows, the challenge is slowly emerging with14.1 percent women and 13.2 percent men in Rajasthan being overweight or obese. The challenges of high blood pressure, especially in men is also emerging. These numbers are below the Indian average, which provides an opportunity to tackle the problem before it escalates further. Rajasthan now needs to develop a strong nutrition strategy to simultaneously address undernutrition and the 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.

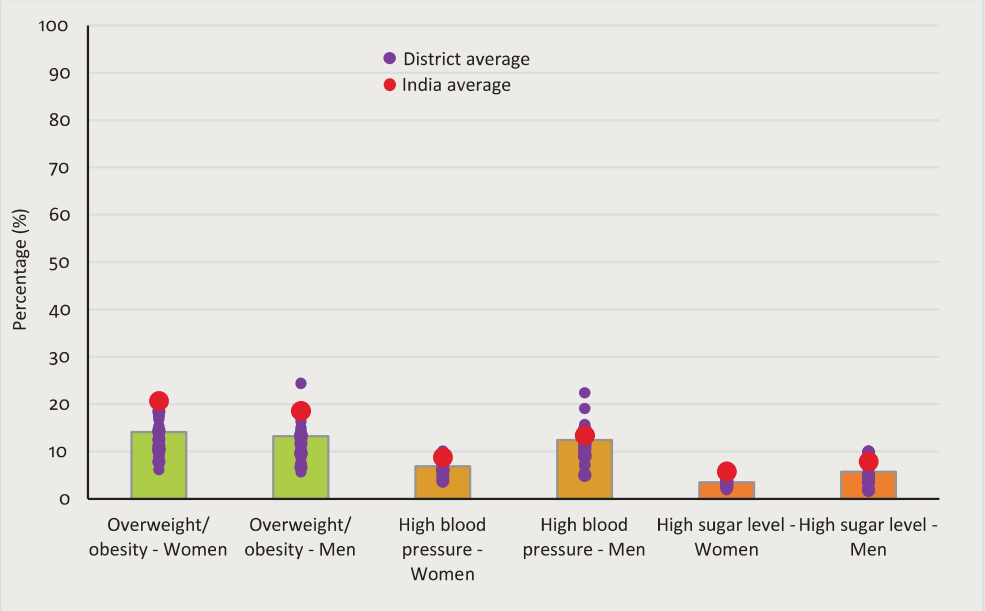
ANC (4 or more visits): Percentage of mothers receiving at least 4 ANCs for the last birth in the last 5 years.

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.

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 Rajasthan in 2016



Source: NFHS-4.
Note: Bars represent state averages; Refer to endnotes for indicator definitions.

Birth registered: Percentage of children under age 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 ≥90mm 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 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 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 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/m2.

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 decisionmaking. 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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