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

Policy Note

No. 22 | NOVEMBER 2017

Improving Nutrition in Kerala

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 variabilities in state-level changes in the determinants of nutrition and in the coverage of health and nutrition interventions. Although all of India's 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 Kerala.

Kerala lies along the coastline, to the extreme south west of the Indian peninsula and has an area of 38,863 square kilometers. The state is divided into 14 districts, 75 taluks and 1535 villages, with a population of 3.34 million people. The literacy rate is 94 percent and the sex ratio is 1084 females for 1000 males (Government of Kerala 2017).

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

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 (World Health Organization 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

Overall, there have been improvements in nutrition and health outcomes in Kerala between 2006 and 2016 (Figure 1). Stunting declined from 24.5 percent to 19.7 percent. The prevalence of wasting remained stagnant with a negligible decline of 0.2 percent (from 15.9 percent to 15.7 percent). The prevalence of low-birth weight declined from 16.1 percent to 13 percent. Exclusive breastfeeding (EBF) rates also declined in the state, from 56.2 percent in 2006 to 53.3 percent in 2016. The prevalence of severe wasting increased from 4.1 percent to 6.5 percent in the last decade (IIPS 2008 and IIPS 2017).

Anemia among women of reproductive age remains a key public health challenge. While the prevalence of anemia among women in Kerala is lower than the national average, it marginally increased from 32.8 percent to 34.2 percent in the last decade.

With regard to variability within the state, stunting among children under five years of age varies across districts, ranging between 12.4 percent in Ernakulam and 27.7 percent in Wayanad district (Map 1).

Anemia prevalence among women of reproductive age varies considerably among districts, with the lowest level in Pathanamthitta (22.4 percent) and the highest level in Kozhikode (42.9 percent) (Map 2). It is above 40 percent in three districts in Kerala (Thrissur, Palakkad and Kozhikode).

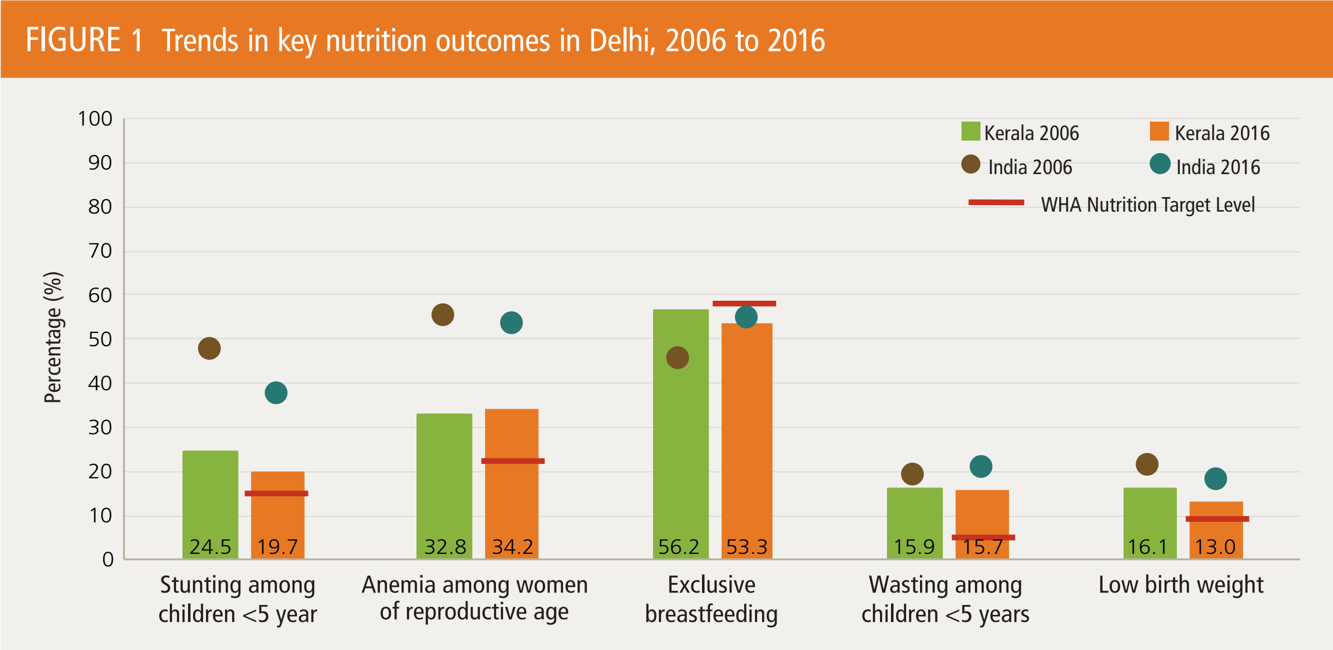
Wasting among children under five years of age in Kerala is very high, with over 15 percent prevalence in 8 out of 14 districts (Map 3). Kasaragod district has the lowest prevalence of wasting (9.7 percent) and severe wasting (3.2 percent) (Map 4). In contrast, Idukki has the highest level of wasting (24.2 percent) and severe wasting (14.3 percent). Wayanad and Idukki districts suffer from multiple burdens of stunting, wasting and severe wasting.

The summary data for EBF is not available for any district in Kerala, making it difficult to assess inter-district variability for the entire state (Map 5).

Changes in the determinants of nutrition

To improve the nutrition of women and children in states such as Kerala, investments must be made to address the determinants of poor nutrition, using a variety of policy instruments and other efforts. Here we examine changes in the immediate determinants of nutrition in the state, as well as the performance

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



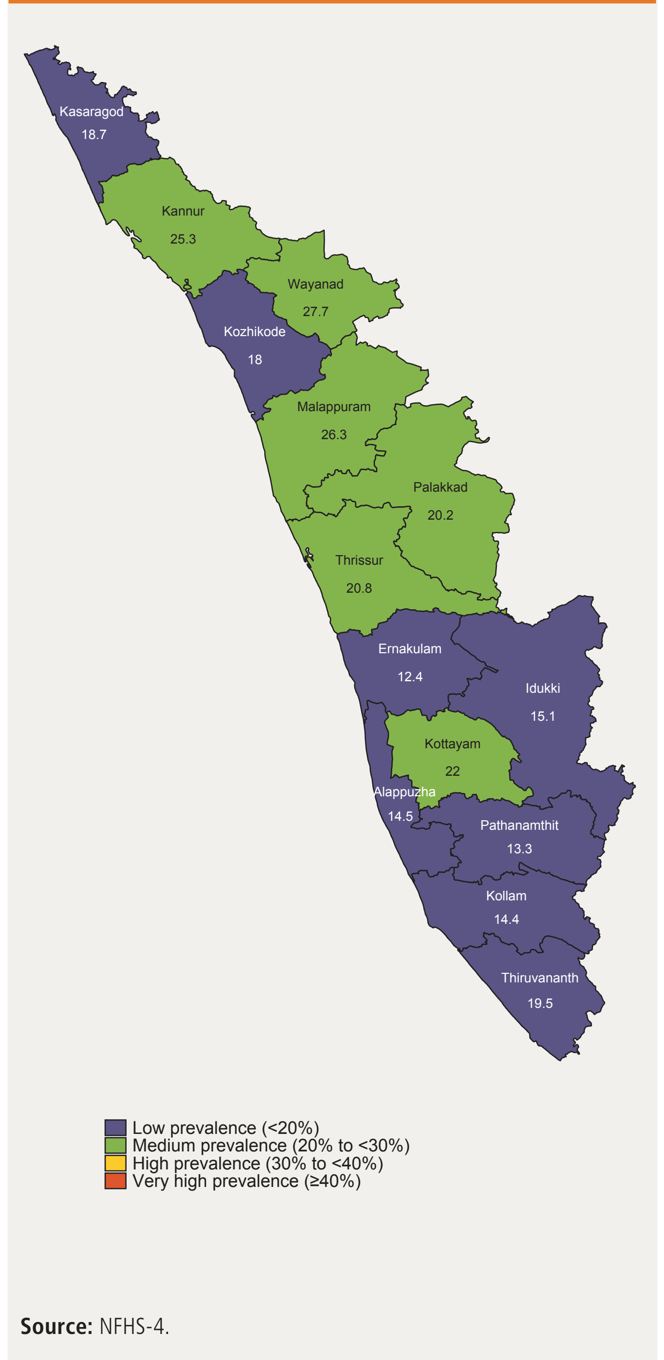
Source: NFHS-3 and NFHS-4; RSoC data used for low birth weight.

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.

of nutrition-specific interventions to address these determinants. This is followed by a description of changes seen in the underlying determinants of nutrition, however we do not examine coverage data on programs to improve underlying determinants in this Note, because this data is not currently available.

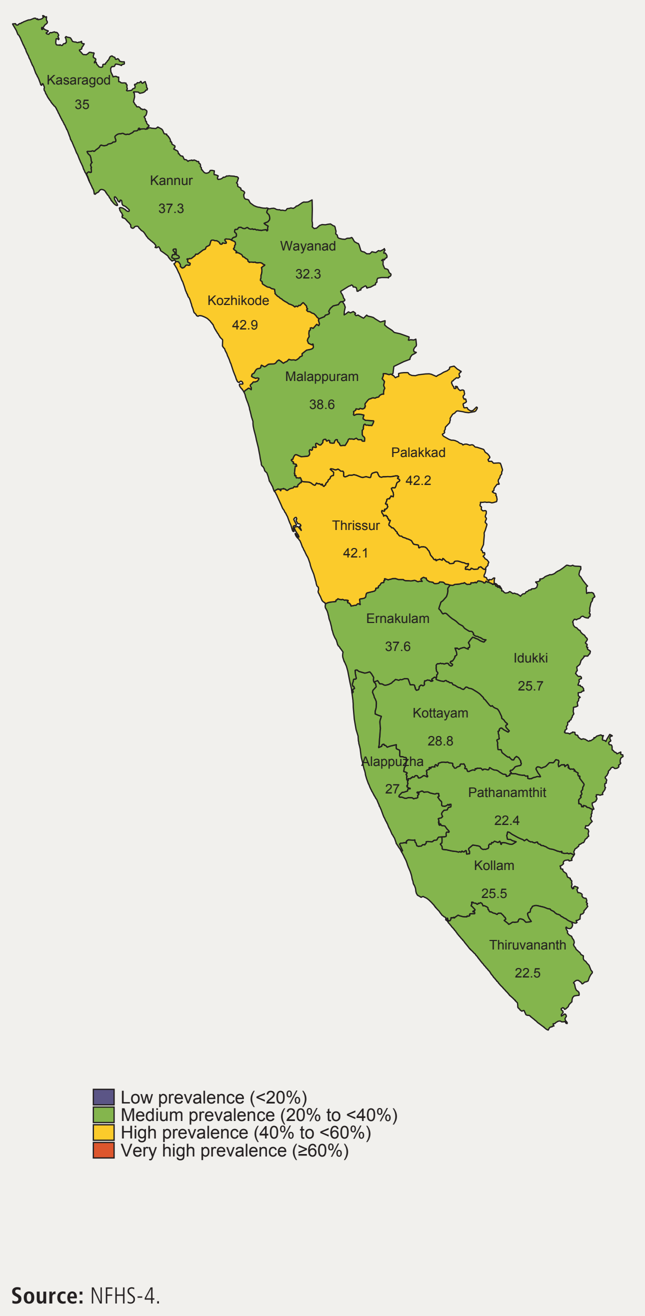
Changes in the ***immediate determinants*** in Kerala have been largely positive (Figure 2). The proportion of women with low body mass index (BMI <18.5 kg/m^2) declined from 18 percent in 2006 to 9.7 percent in 2016. Early initiation of breastfeeding increased from 55.4 percent to 64.3 percent over the last decade. Complementary feeding practices in the state still need attention. Kerala performed extraordinarily well in 2006 on timely introduction of complementary foods to children between 6 to 8 months (93.9 percent). However, there has been

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



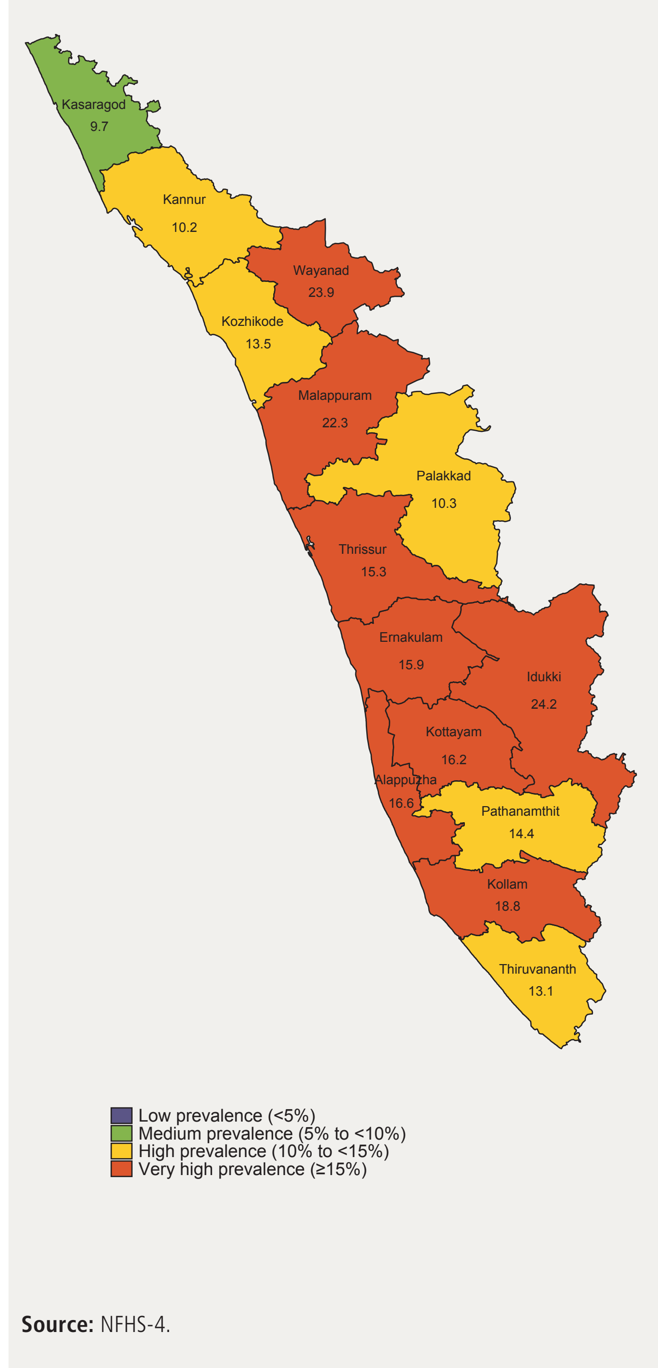
Source: NFHS-4.

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



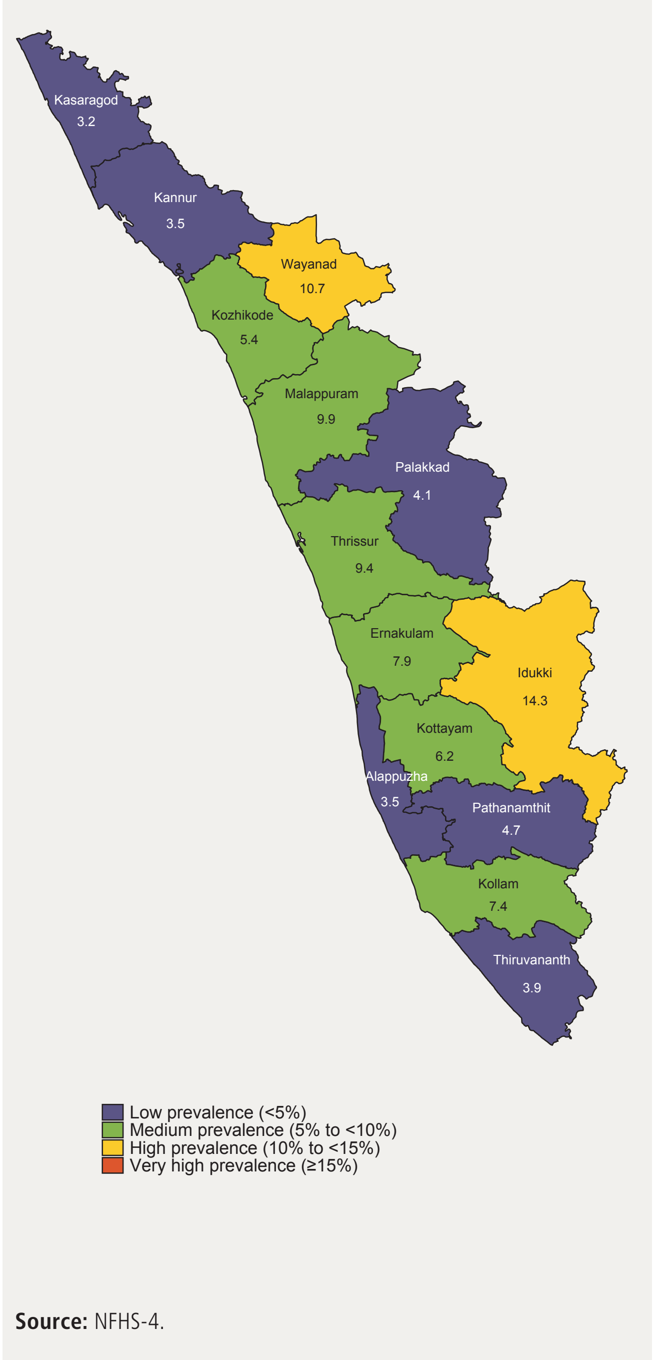
Source: NFHS-4.

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



Source: NFHS-4.

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



Source: NFHS-4.

a huge decline (30.8 percentage points) in the proportion of children introduced to timely complementary feeding from 2006 to 2016 (63.1 percent). This calls for an examination of reasons influencing such a massive decline. Furthermore, less than a quarter of children in the age group of 6 to 23 months (21.4 percent) received an adequate diet, which suggests an overall level of poor complementary feeding practices.

Disease burden among children improved in Kerala. The proportion of children with diarrhea fell from 6.8 percent in 2006 to 3.4 percent in 2016 and the prevalence of acute respiratory infection (ARI) declined from 2.7 percent to 0.8 percent during the same period.

The overall coverage of all ***nutrition-specific interventions*** in Kerala is high (Figure 3). The proportion

MAP 5 Exclusive breastfeeding in Kerala in 2016, by district

Source: NFHS-4.

of women who had an antenatal check-up (ANC) in their first trimester of pregnancy increased from 91.9 percent in 2006 to 95.1 percent in 2016. However, the proportion of women who received 4 or more ANC visits and those who consumed iron-folic acid (IFA) supplements for 100 or more days during pregnancy declined from 93 percent to 90.2 percent and from 70.1 percent to 67.1 percent, respectively, during this period. While the coverage is still high, this trend reversal is of concern and needs further investigation.

Interventions related to child-birth, such as institutional delivery and births assisted by skilled birth attendants have a universal coverage (100 percent). Nutrition interventions focused on children have improved in the last ten years. The proportion of children who were fully immunized increased from 75.3 percent to 82.1 percent. The proportion of children receiving vitamin A supplementation increased substantially from 31.5 percent to 74.4 percent. Use of oral rehydration salts (ORS) during diarrhea among children increased from 32.4 percent to 49.4 percent.

Between 2006 and 2016, the coverage of food supplements improved among pregnant women (from 15.8 percent to 23 percent), lactating mothers (from 10.5 percent to 15 percent) and children (from 15.8 percent to 43.2 percent).

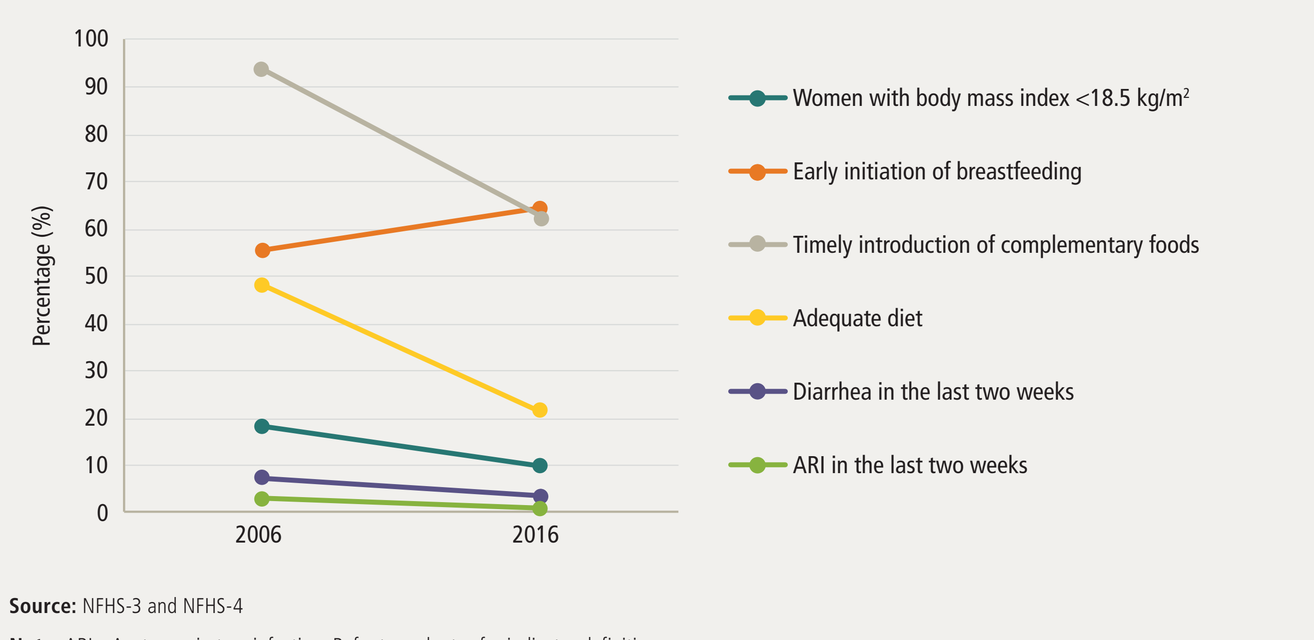
In the last decade, Kerala experienced improvements in all the ***underlying determinants*** of nutrition (Figure 4). Literacy among women improved from 93 percent to 97.9 percent, and the proportion of women with 10 or more years of education increased from 48.7 percent to 72.2 percent over the decade. Underage marriage among girls, that is, below the age of 18, declined remarkably from 15.4 percent to 7.6 percent.

Access to infrastructure and household facilities was high in 2006 and it further improved in the last decade. Percentage of households with an improved drinking water source increased from 69.1 percent in 2006 to 94.3 percent in 2016, while households with electricity increased from 91 percent to 99.2 percent. Households using improved sanitation facilities also improved from 90.5 percent to 98.1 percent, alongside a reduction in open defecation which halved from 3.8 percent to 1.9 percent.

Inter-district variability in selected coverage of interventions in Kerala, in 2016

As seen in Figures 5-7, there is a high degree of inter-district variability among the 14 districts in Kerala for some key determinants (that is, early initiation of breastfeeding, adequate diet, MCP card, IFA consumption during pregnancy, newborn check-up, JSY, full immunization, Vitamin A and women with more than ten years of education).

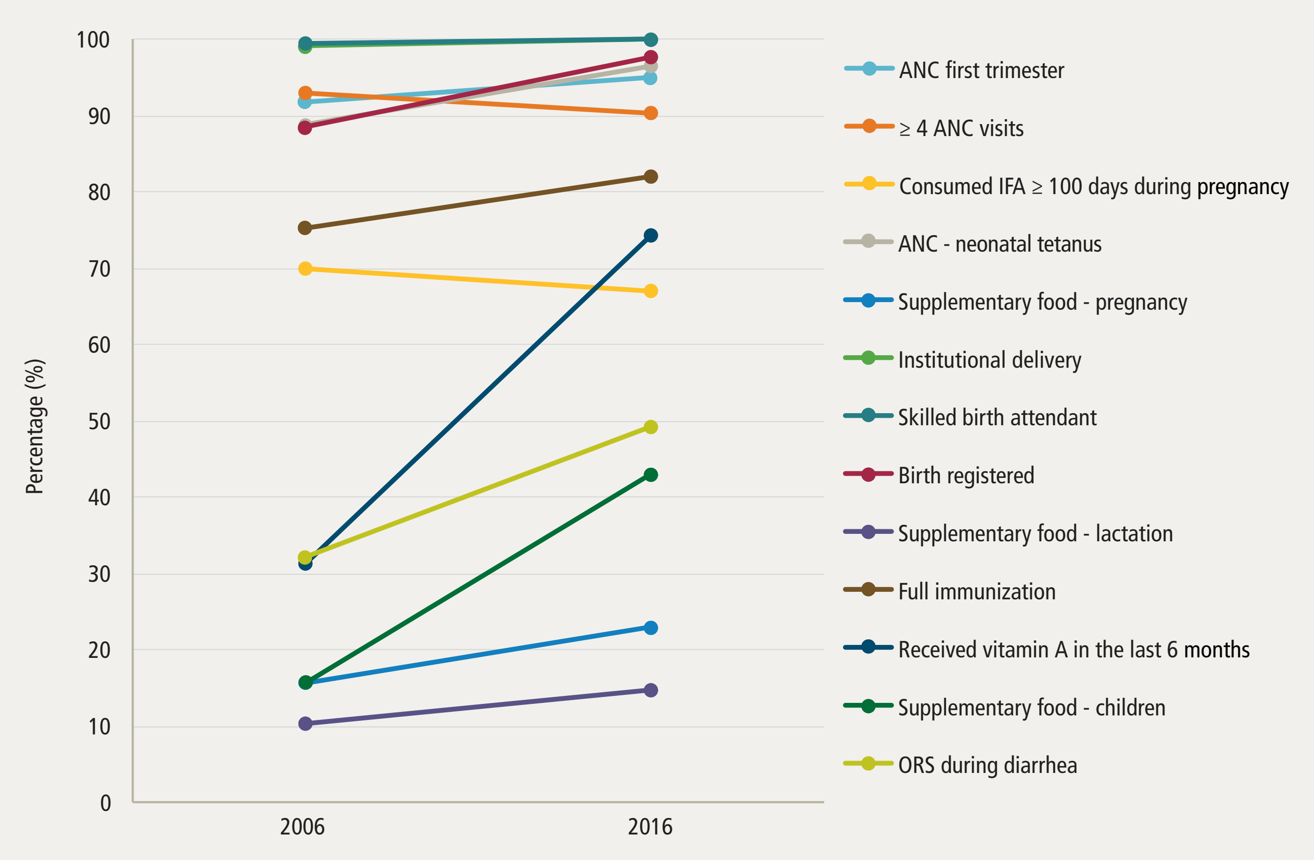
FIGURE 2 Changes in immediate determinants of nutrition in Kerala, 2006 to 2016



Source: NFHS-3 and NFHS-4

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

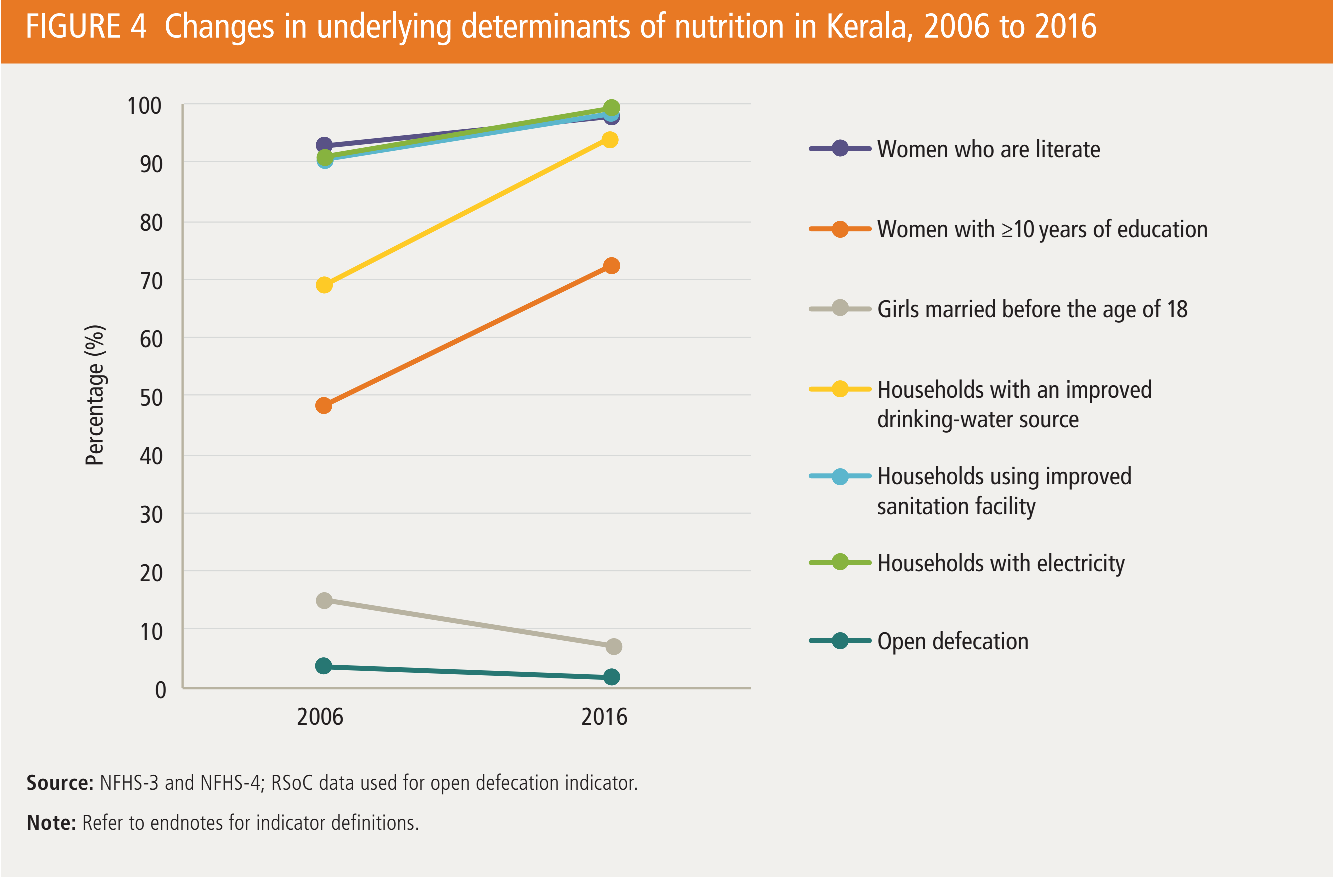
FIGURE 3 Changes in the coverage of nutrition-specific interventions along the continuum of care in Kerala, 2006 to 2016



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 Kerala, 2006 to 2016



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

Note: Refer to endnotes for indicator definitions.

In contrast, there is low inter-district variability for some other determinants (for example, women with low body-mass index, diarrhea and ARI among children in the last two weeks, ANC first trimester, neonatal tetanus, institutional delivery, skilled birth attendant, birth registration, women who are literate, households with an improved drinking-water source, households using improved sanitation facilities and households with electricity). For all the indicators except cash transfers availed through JSY and MCP card, nearly all or a majority of the districts in Kerala perform better than the national average.

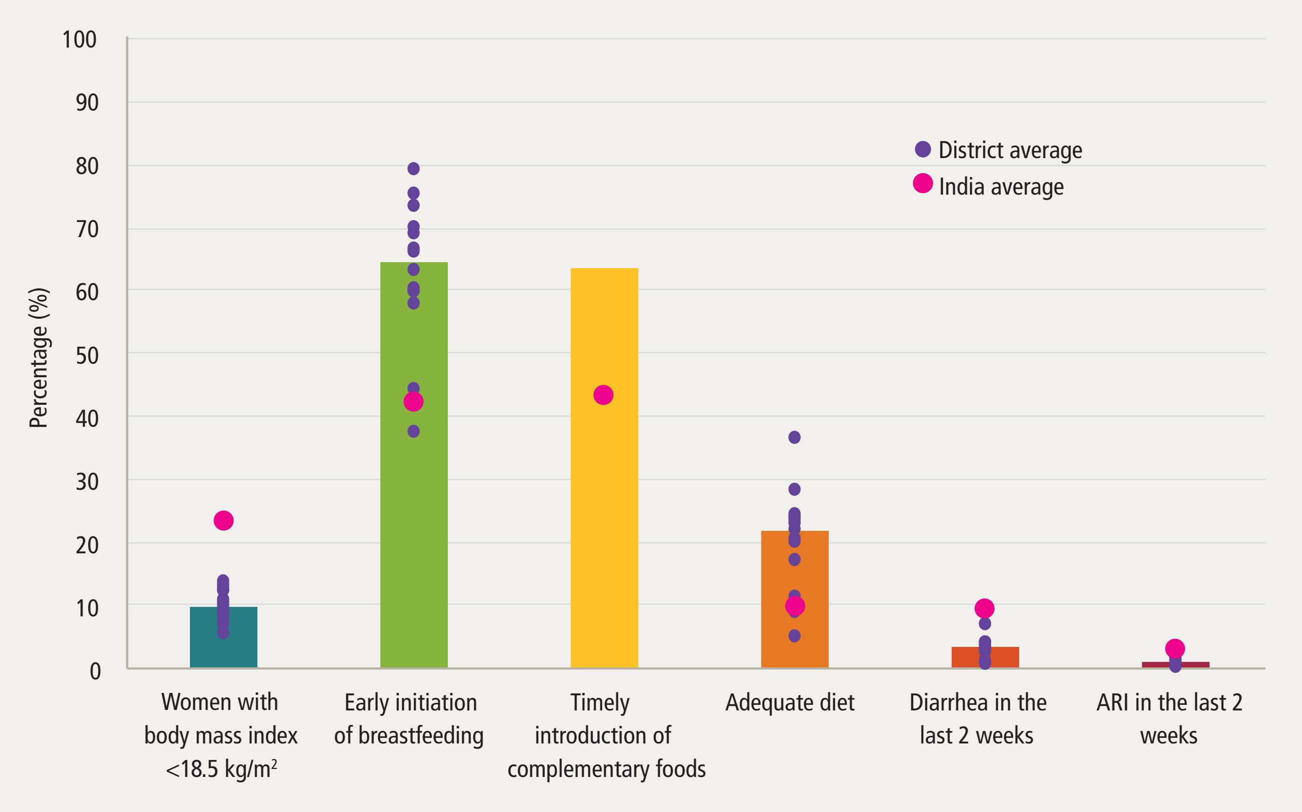
For many determinants (for example, women with low BMI, pregnant women who received at least 4 ANC visits, IFA during pregnancy, interventions during delivery, ORS during diarrhea, women's education, girls married before the age of 18 years, households with electricity and improved sanitation), all or almost all districts in Delhi are doing better than the national average. For some others, such as early initiation of breastfeeding, adequate diet among children and availing of Janani Suraksha Yojana (JSY) cash transfer, all or most districts in Delhi fall below the national average.

LOOKING FORWARD: IMPLICATIONS & RECOMMENDATIONS

In the era of India's commitment to global nutrition targets, it is an opportune time for Kerala 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 of Kerala has performed well compared to the national average on all nutrition outcomes in 2006 and has further improved in the last ten years. The prevalence of wasting, however, is still high. This calls for special focused actions to tackle this issue. Special efforts are also needed to improve anemia among women of reproductive age since there was a marginal increase in its prevalence over the last decade. An examination of inter-district and intra-district trends by the administration will help identify areas which require targeted efforts to address malnutrition.

To achieve progress on nutrition, Kerala should continue to invest to sustain the high coverage of

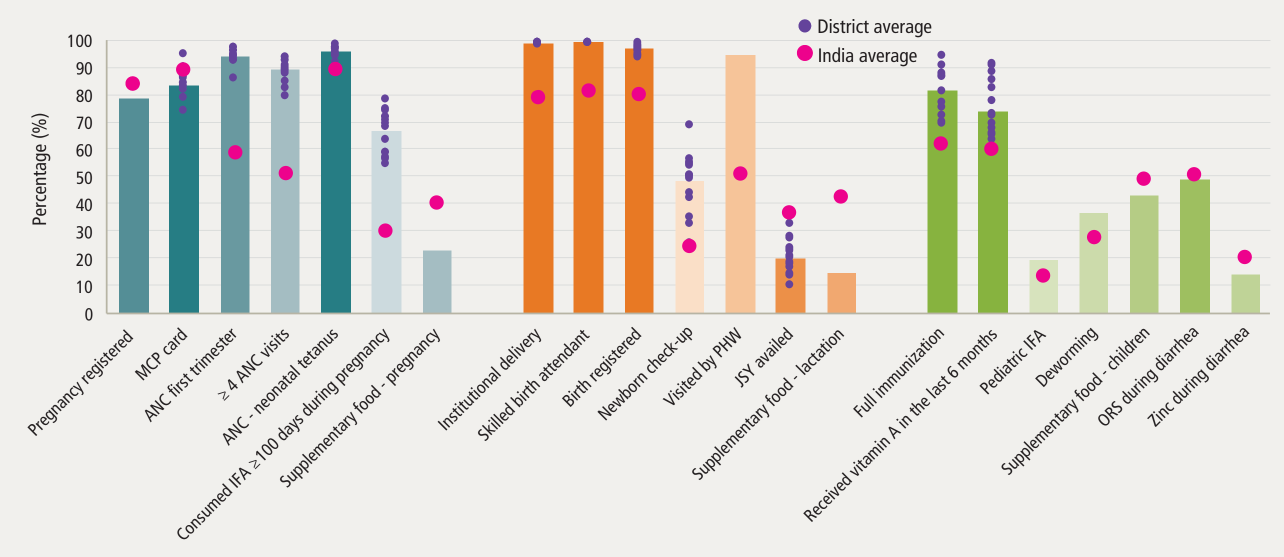
FIGURE 5 Inter-district variability in immediate determinants in Kerala, in 2016



Source: NFHS-4.

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

FIGURE 6 Inter-district variability in selected coverage of nutrition-specific interventions in Kerala, in 2016



Source: NFHS-4; RSoC data was used for indicators on pregnancy registration, food supplementation during pregnancy, lactating mothers 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.

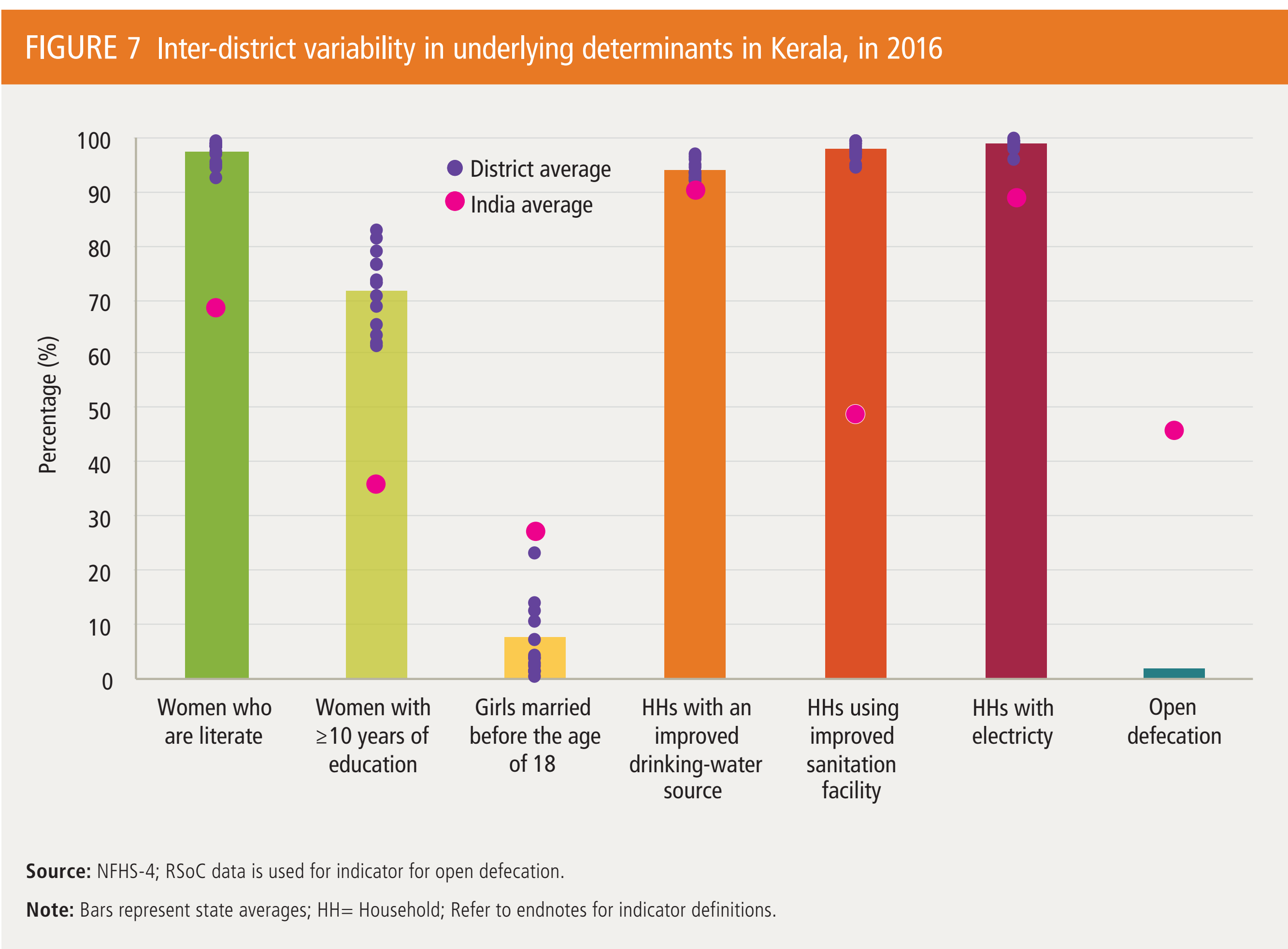


FIGURE 7 Inter-district variability in underlying determinants in Kerala, in 2016

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.

interventions targeting the first 1000 days of life. Special emphasis is required to reverse the declining trend of IFA consumption by pregnant women. Interventions related to delivery have already achieved universal coverage, calling for continued investments to maintain the high levels of coverage. Among post-natal interventions, action is required to further increase the coverage of full immunization as the current coverage is still not optimal. The coverage of pediatric IFA, deworming for children, and ORS and zinc treatment during diarrhea is below 50 percent and needs to be improved. The proportion of children exposed to timely complementary feeding has declined by 30.8 percentage points in the last decade, calling for an examination of reasons influencing such a massive reversal.

The coverage of supplementary food for pregnant women, lactating women and children is low. The state needs to investigate the reasons for the low exposure and ensure that the program reaches the people who need the additional supplementation from the government.

On underlying determinants, several improvements have taken place. There has been an increase in the number of women with ten years of education, reduction in the prevalence of girls married before 18 years and decline in open defecation. Kerala has performed well on the underlying determinants with near universal coverage for indicators related to electricity, drinking water and sanitation.

Alongside investments in early nutrition, it is also important for Kerala to consider the challenge of non-communicable diseases. As Figure 8 below shows, nearly one-third of women and men in Kerala are overweight or obese which is higher than the national average. The challenges of high blood pressure and high sugar levels, especially in men, are also emerging. The high sugar levels among men and women in Kerala are higher than the national average. Kerala now needs to develop a strong nutrition strategy to simultaneously address undernutrition and these 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).

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.

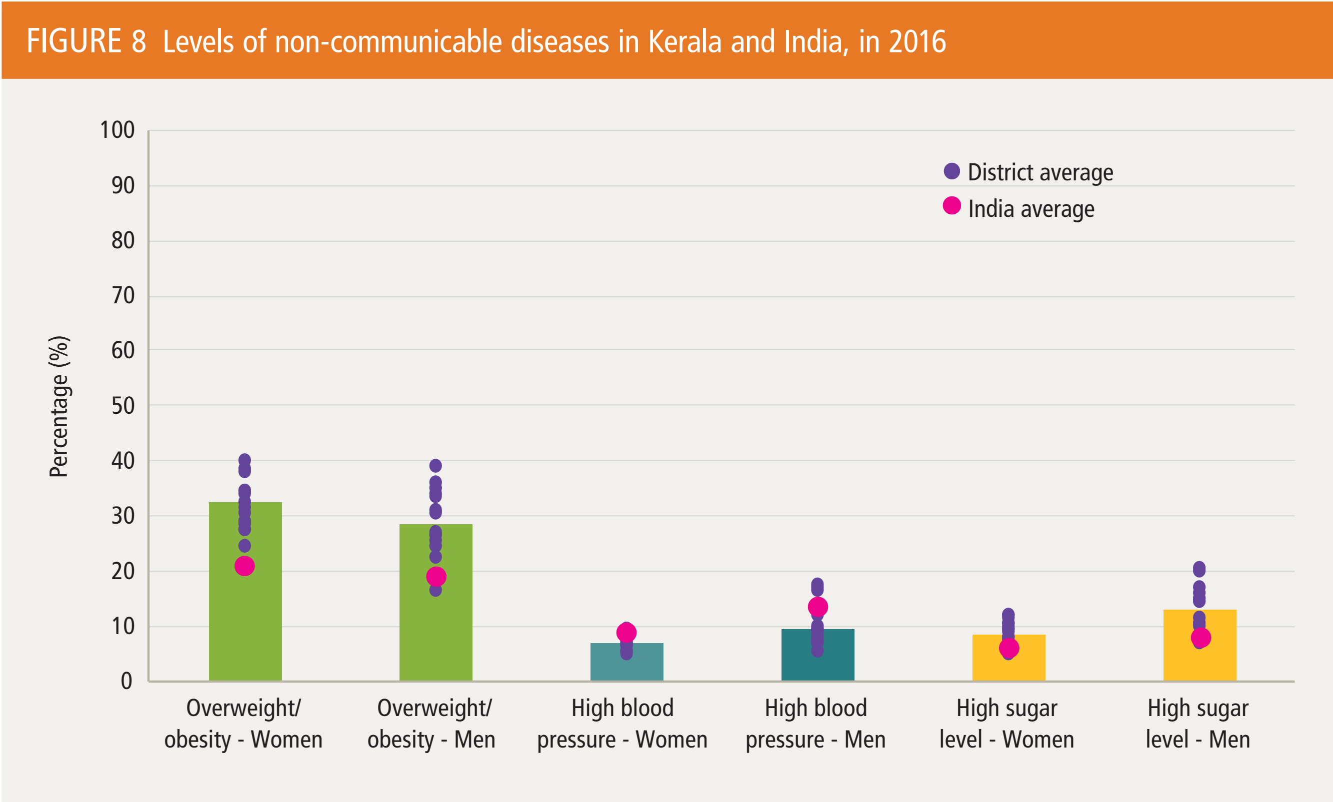
Institutional delivery: Percentage of births delivered in a health facility for births in the last 5 years.

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.

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



Source: NFHS-4.

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

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.

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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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