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How Childhood Stunting Reduced in Gujarat: An Analysis of Change Between 1992 and 2016

Report

No. 13 | May 2021

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SUGGESTED CITATION

Avula, R., P. H. Nguyen, S. Kanani, S. Mani, N. Kohli, N. George, and P. Menon. 2021. *How Childhood Stunting Reduced in Gujarat: An Analysis of Change Between 1992 and 2016*. POSHAN Report 13. New Delhi, India: International Food Policy Research Institute.

ABOUT POSHAN

POSHAN (Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India) is a multiyear 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 is led by International Food Policy Research Institute (IFPRI) India.

ACKNOWLEDGEMENTS

We are grateful to Binu Anand (WeCan) for his review of the report. We thank Sattvika Ashok (IFPRI) for her support in organizing the report, Vera de Jong (consultant) for copyediting, and Heather Chen (IFPRI) for formatting the report.

Financial support for this report 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 the report.

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TABLE OF CONTENTS

| | |
|--|-----|
| LIST OF TABLES..... | iii |
| LIST OF FIGURES | iii |
| LIST OF ABBREVIATIONS..... | v |
| EXECUTIVE SUMMARY | vii |
| Methods..... | vii |
| Findings | vii |
| Looking forward | xi |
| 1. INTRODUCTION | 1 |
| 2. OBJECTIVES..... | 1 |
| 3. METHODS..... | 2 |
| 4. RESULTS | 4 |
| 4.1. Nutrition and Health Outcomes and Their Determinants in Gujarat, 1992–2016 | 4 |
| 4.1.1 Nutrition and health outcomes in Gujarat, 1992–2016..... | 4 |
| 4.1.2 Changes in immediate determinants of nutrition in Gujarat, 1992–2016 | 6 |
| 4.1.3 Changes in the underlying determinants of nutrition in Gujarat, 1992–2016..... | 8 |
| 4.1.4 Changes in the coverage of nutrition-specific interventions in Gujarat, 1992–2016 ... | 10 |
| 4.2. Determinants of Changes in Stunting in Gujarat, 2006–2016 | 12 |
| 4.2.1. Advancements in nutrition and health policies and programs in Gujarat | 13 |
| 4.2.2. Improvements in socio-economic status in Gujarat | 17 |
| 4.2.3. Improvements in care for women in Gujarat..... | 17 |
| 4.3. Political Transitions in Gujarat (1992–2016)..... | 18 |
| 4.4. Summary | 19 |
| 4.5 Looking Ahead | 28 |
| Table 9. Changes to districts in Gujarat in 2013..... | 29 |
| 4.5.1 Interdistrict variability in nutrition and health outcomes in 2019..... | 29 |
| | 36 |
| | 36 |
| 4.5.2 Interdistrict variability in the immediate determinants of nutrition in 2019 | 37 |
| 4.5.3 Interdistrict variability in underlying determinants of nutrition in 2019..... | 37 |
| 4.5.4 Interdistrict variability in coverage of nutrition-specific interventions in 2019..... | 38 |
| 5. SUMMARY AND CONCLUSIONS | 39 |
| 6. REFERENCES | 40 |

LIST OF TABLES

| | |
|---|----|
| Table 1. Stakeholders interviewed | 3 |
| Table 2. Changes in nutrition and health outcomes in Gujarat in comparison to national average, 1992 to 2016 | 5 |
| Table 3. Changes in immediate determinants of nutrition in Gujarat, 1992–2016 | 7 |
| Table 4. Changes in underlying determinants of nutrition, 1992–2016 | 9 |
| Table 5. Changes in the coverage of nutrition-specific interventions, 1992–2016 | 11 |
| Table 6. Integrated Child Development Services (ICDS): Program evolution in Gujarat, 1990–2015 | 21 |
| Table 7. Health program evolution in Gujarat, 1990–2015 | 23 |
| Table 8. Factors which supported changes in nutrition and health programs and policies in Gujarat between 1992 and 2016 | 25 |

LIST OF FIGURES

| | |
|--|----|
| Figure 1. Conceptual framework for nutrition outcomes, determinants, and interventions | 3 |
| Figure 2. Changes in stunting among children in Gujarat by age group, between 2006 and 2016 | 5 |
| Figure 3. Changes in immediate determinants of nutrition between 2006 and 2016 | 8 |
| Figure 4. Changes in underlying determinants between 2006 and 2016 | 10 |
| Figure 5. Changes in the coverage of nutrition-specific interventions between 2006 and 2016 | 12 |
| Figure 6. Factors contributing to changes in stunting among children 6 to 59 months, between 2006 and 2016 | 13 |
| Figure 7. A snapshot of Integrated Child Development Services (ICDS) and health programs in Gujarat, 1990–2015 | 20 |
| Figure 8. Stunting among children under five years of age in districts across Gujarat, 2019 | 30 |
| Figure 9. Number of stunted children under five years of age in Gujarat, 2019 | 31 |
| Figure 10. Wasting among children under five years of age in districts across Gujarat, 2019 | 31 |
| Figure 11. Number of wasted children under five years of age in Gujarat, 2019 | 32 |
| Figure 12. Underweight among children under five years of age in districts across Gujarat, 2019 | 32 |
| Figure 13. Number of underweight children under five years of age in Gujarat, 2019 | 33 |
| Figure 14. Anemia among non-pregnant women in districts across Gujarat, 2019 | 34 |
| Figure 15. Number of non-pregnant women with anemia in Gujarat, 2019 | 34 |
| Figure 16. Anemia among pregnant women in districts across Gujarat, 2019 | 35 |
| Figure 17. Number of pregnant women with anemia in Gujarat, 2019 | 35 |

Figure 18. Anemia among children under five years of age in districts across Gujarat, 201936
Figure 19. Number of children under five years of age with anemia in Gujarat, 201936

LIST OF ABBREVIATIONS

| | |
|--------|---|
| ANC | antenatal care |
| ANM | auxiliary nurse midwife |
| ARI | acute respiratory infection |
| ASHA | Accredited Social Health Activist |
| ATVT | Aapno Taluko Vibrant Taluko |
| AWC | Anganwadi Center |
| AWW | Anganwadi Worker |
| BJP | Bharatiya Janata Party |
| BMI | body mass index |
| BPL | below poverty line |
| CF | Complementary Feeding |
| CNSG | Comprehensive Nutrition Survey in Gujarat |
| CSSM | Child Survival and Safe Motherhood |
| DHFW | Department of Health and Family Welfare |
| DWCD | Department of Women and Child Development |
| EBF | exclusive breastfeeding |
| ECCE | Early Childhood Care and Education |
| EIBF | early initiation of breastfeeding |
| GOI | Government of India |
| GRC | Gender Resource Center |
| GSNM | Gujarat State Nutrition Mission |
| ICDS | Integrated Child Development Services |
| IFA | iron and folic acid |
| IGMSY | Indira Gandhi Matritva Sahyog Yojana |
| IMNCI | Integrated Management of Neonatal and Childhood Illnesses |
| IMR | infant mortality rate |
| IYCF | infant and young child feeding |
| JSY | Janani Suraksha Yojana |
| MAM | moderate acute malnutrition |
| MMR | maternal mortality rate |
| NFHS | National Family Health Survey |
| NRC | Nutrition Rehabilitation Center |
| NRHM | National Rural Health Mission |
| ORS | oral rehydration solutions |
| PNC | postnatal care |
| POSHAN | Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India |
| RBSK | Rashtriya Bal Swasthya Karyakram |
| RCH | reproductive and child health |
| RSoC | Rapid Survey on Children |
| SAM | severe acute malnutrition |
| SC | Scheduled Caste |
| SES | socio-economic status |
| SUN | Scaling Up Nutrition |
| TFR | total fertility rate |
| UNICEF | United Nations Children's Fund |
| USAID | United States Agency for International Development |
| WCD | Women and Child Development |

WRA women of reproductive age

EXECUTIVE SUMMARY

India comprises one-sixth of the world's population and one-third of the global burden of undernutrition. Between 2006 and 2016, India made progress in reducing stunting among children below five years; the progress, however, was not uniform across all its states (Menon et al. 2018). There are interstate differences in stunting reduction despite a common national policy framework for nutrition-specific and nutrition-sensitive programs. Given the paucity of insights on what factors drive successful change in nutritional outcomes such as stunting at the state level in India, we conducted studies in the four states of Chhattisgarh, Gujarat, Odisha, and Tamil Nadu.

In this report, we present an analysis of the change in stunting among children less than five years of age over a 24-year period in the state of Gujarat in India. We chose to study Gujarat—along with the states of Odisha (Kohli et al. 2017) and Chhattisgarh (Kohli et al. 2020)—because between 2006 and 2016, declines in stunting in these states, in absolute terms, were higher than the national average.

Our key goals were to: 1) examine changes in child stunting, known determinants of stunting and key health and nutrition interventions between 1992 and 2016; 2) assess the contribution of diverse determinants and intervention coverage changes to the changes in stunting between 2006 and 2016; and (3) interpret the changes in the context of policies, programs and other changes in the state.

Using diverse sources of data, in this report we synthesize insights on how state-level leadership, policies, programs, and other changes across society came together to support the changes seen in child growth outcomes over this period. Based on a rapid analysis of more recent trends, we also offer insights on actions that are needed to support achievement of state nutrition goals.

Methods

We used a variety of data sources and research methods. Using multiple rounds of data from surveys, we developed a 24-year (1992–2016) timeline of changes in stunting and its known determinants. Specifically, we analyzed four rounds of the National Family Health Survey (NFHS—1992/1993, 1998/1999, 2005/2006, 2015/2016) (IIPS 1993; 1999; 2006; 2016) and the Annual Health Survey (where necessary). First, we examined the data on stunting reduction, changes in known drivers of undernutrition, and intervention coverage changes descriptively. Next, we used regression–decomposition analysis to examine the contributions of changes in known determinants of stunting between 2006 and 2016. We conducted a literature review to assess changes in policies and programs pertaining to key drivers of nutrition between 1992 and 2016. The literature review had two objectives: to construct a policy timeline and analyze policy changes over the period of stunting reduction, and to gather additional literature to support overall analysis and interpretation. We conducted stakeholder interviews to supplement our analysis and to add experiential insights on potential reasons for changes in key programs and policies. We integrated insights from all these different sources of information to interpret what drove change and what contributed to that change in Gujarat. Finally, we briefly juxtapose the findings on positive change against the most recently available data on nutrition in Gujarat.

Findings

Gujarat, a state in western India with a population of 60 million people, is one of the country's high-income states. Economic growth was primarily driven by the state's services and industries. Despite this, for several years Gujarat's progress on nutrition was slow, especially compared to

other high-income states. However, major improvements were observed in undernutrition among children between 2006 and 2016.

What changes were seen on stunting and its known determinants and coverage of interventions between 1992 and 2016 in Gujarat?

Between 1992 and 2006, stunting changed little in Gujarat. Much of the success in the reduction of stunting among children below five years of age was achieved between 2006 and 2016. During that decade, there was a 13 percentage point (pp) decline in stunting among children below five years of age. Higher declines were observed among children 6 to 23 months (13.8 pp) and among children 24 to 59 months (14.1 pp), compared to children under 5 months (5.6 pp). This is likely because improvements accumulate over the early part of the life course and became more visible in these older infants.

The **immediate determinants** of child nutrition remained stagnant from the early 1990s until the early 2000s. Between 2006 and 2016, there was improvement in women's health, infant and young child feeding (IYCF) practices, and child health, all of which are important immediate determinants of child nutrition. During this period, the proportion of women with low body mass index (BMI) declined from 44.2 percent to 30.6 percent. Early initiation of breastfeeding increased by 23 pp (29 to 52 percent), and exclusive breastfeeding increased by 8 pp (48 to 56 percent), indicating progress; there are, however, lingering gaps that need attention. Complementary feeding (CF) remained a major challenge. The timely introduction of complementary foods declined (from 59 to 52 percent) and, in 2016, less than 15 percent of children consumed the recommended number of food groups for their age.

On a positive note, there was a substantial decline in the disease burden among children. The proportion of children with diarrhea declined from 20 percent in 1999 to 10 percent in 2016 and the proportion of children with acute respiratory infections declined substantially from 11 percent in 1998 to 1.4 percent in 2016.

Between 1992 and 2016, there were improvements in some of the **underlying determinants** of nutrition in Gujarat. State infrastructure improved, including roads, electricity, drinking water, and sanitation facilities; by 2016, 95 percent of households had electricity and 87 percent had access to improved drinking water sources, however only 56 percent of households were using improved sanitation facilities. There have also been only modest improvements in determinants pertaining to women's status, including education and age at marriage. By 2016, only 26 percent of women had 10 or more years of education and 48 percent of women still got married earlier than the legal age of marriage. The decline in early marriage is parallel to improvements in education.

The **coverage of nutrition-specific interventions** has improved steadily over time, with significant change between 2006 and 2016. Some notable successes in coverage include:

Pregnancy care: The proportion of women who had 4 or more antenatal care (ANC) visits increased from 51 to 70 percent. While there was a 5 pp decline (from 82 to 77 percent) in the receipt of iron and folic acid (IFA) supplements during pregnancy, there was a 12 pp increase in the consumption of IFA supplements for 100 or more days. The proportion of women receiving food supplements nearly tripled, from 18 to 55 percent.

Delivery/birth care: Improvements have been steady for interventions such as delivery in health facilities and births assisted by a health professional, reaching 90 percent coverage in 2016.

Postpartum and early childhood: There was a quadrupling in the proportion of women receiving food supplements during lactation (11 to 48 percent). A similarly remarkable increase was observed in the receipt of food supplements for children below three years. Although between 2006 and 2016 there was a significant increase in the number of children receiving vitamin A supplementation, the coverage remains less than 75 percent. Over that period, there was limited progress in immunization rates; in Gujarat in 2016, only one in two children had been fully immunized and hence it remains a matter of concern.

What factors contributed to changes in stunting between 2006 and 2016? Insights from decomposition analysis

Our regression decomposition analysis indicates that improvements in health and nutrition services (14 percent), improvements in socio-economic status (SES) (12.8 percent), maternal BMI (4.9 percent) and maternal education (5.6 percent), hygiene (9.6 percent), improved village sanitation and increased access to electricity (7.2 percent), and access to health insurance contributed to actual changes in stunting among children 6 to 59 months of age. Unfortunately, our analysis only explained 60 percent of the actual change seen in stunting over this period; this suggests that there are additional factors which are not captured in this analysis.

Based on these findings, we prioritized three areas for deeper policy and stakeholder analysis: 1) advancements in nutrition and health services; 2) improvements in SES; and 3) improvements in care for women.

How did changes in the key drivers of stunting take place? Insights from policy analysis and stakeholder interviews

Advancements in nutrition and health services: Until the mid-2000s, Gujarat followed the national mandate for health and nutrition programs. In 2005, however, state leaders were shocked at the malnutrition status (as indicated by the NFHS–3). Finding it unacceptable, they began to implement measures to address it. Malnutrition became a prominent topic within the public discourse and key public figures became catalysts for change (Fiedler et al. 2012). In 2012, to provide strategic direction for implementation of programs, the Gujarat State Nutrition Mission was established; it became a platform for coordinating and integrating the efforts of key government departments concerned with nutrition, health, education, and water and sanitation.

The state’s vision to address malnutrition was supported by opportunities arising from the national mandate to expand programs as well as state level initiatives and innovations. At the national level, both Integrated Child Development Services (ICDS) and health programs took initiatives to improve coverage of nutrition and health interventions. National-level health programs were being implemented across India to address high maternal mortality rate (MMR) and infant mortality rate (IMR). Under the Supreme Court’s interim orders of 2001 and 2004 and the directive in 2007, the ICDS was in the process of universalization across the country. The National Rural Health Mission (NRHM) was also launched in 2005 to increase reach and coverage of maternal and child interventions.

Several state level programs and initiatives were implemented between 2000 and 2016, all of which aimed to address maternal and child nutrition:

- 2001–2002: ICDS was shifted from the DHFW to the Department of Women and Child Development (DWCD).
- 2005: Gujarat state health mission launched to support NRHM implementation in the state

- 2005: Chiranjeevi Yojana, a public–private partnership innovation aimed at improving delivery care for the rural poor
- 2007: Aapno Taluko Vibrant Taluko, to facilitate local ownership and supervision of ICDS
- 2007: Mamta Abhiyan, to improve convergence between ICDS and health programs
- 2007: Synchronization of health and ICDS geographic coverage boundaries to strengthen convergence
- 2009: Bal Sakha Scheme for neonatal care for below the poverty line (BPL) families
- 2010: E-Mamta, a tracking tool to ensure continuity of services for women and children
- 2010: Anna Prashan Diwas, a monthly fixed-day celebration to improve complementary feeding
- 2012–2013: Mamata Ghar, which provides pregnancy, delivery, and postpartum care for women in remote areas

The building and strengthening of systems took place under an overarching enabling policy environment. Stakeholders indicated that there were capable and sensitized bureaucrats who could use resources effectively and set up systems. Resources from the national programs were used to expand coverage, increase human resources, improve infrastructure and training, and provide flexi-funds to block-level officials for investment in innovations. Several stakeholders emphasized that for many schemes the state government had used its own funds to augment central government funding. The state’s efforts were bolstered by champions within the government who facilitated actions for nutrition. Furthermore, partnerships with NGOs and academia facilitated strengthening of the programs. Several stakeholders identified champions within the government who played a key role in ensuring the prominence for nutrition in the health program.

Since ICDS was a new program under DWCD, the departmental leadership was enthused to launch several programs, including allocating resources for ICDS expansion and quality. Several stakeholders attributed improved access to care to these innovations, noting that the convergence between ICDS and health programs was bolstered by programs such as Mamta Abhiyan. These investments are reflected in the changes in the coverage of health and nutrition interventions. Other sectors such as the Department of Food, Civil Supplies and Consumer Affairs initiated state-level mandatory fortification of essential food commodities with micronutrients, thereby supporting the state’s efforts to reduce malnutrition.

Improvements in SES: Gujarat is one of the states that benefited the most from the economic reforms that were launched in India between 1991 and 1992; sectors in which the state’s performance exceeded that of the rest of the nation included forestry and logging, manufacturing, electricity, gas and water supply, transport, storage, trade and hotels (Dholakia 2007). In 2005, Gujarat was one of the fastest growing states in the country and its growth was driven mainly by services including trade, transport, storage, communication, financial services, real estate, professional services, and industry including mining, manufacturing, utilities, and construction. The proportion of the population that was below the poverty line (BPL) declined from 38 percent in 1984 to 17 percent in 2012. However, poverty rates are higher than 20 percent in some parts of the state, and even higher than 30 percent in some eastern districts (World Bank 2017). A few respondents also mentioned economic progress as the key underlying contributor to progress on nutrition; progress was linked to investments in infrastructure which in turn helped improve access to services.

Improvements in care for women: Women’s education, age at marriage/childbirth and empowerment are recognized as important contributors to women and child nutrition. However, progress for women has been mixed in Gujarat. The proportion of women with more than 10 years

of education is below the national average in 2016. Although there was a decline in the proportion of women between 20 to 24 years getting married before the age of 18, still, 48 percent of women were married before 18 even in 2016. In rural areas, there was a sharp decline in women's participation in the labor force between 2005 and 2012 from 62 to 38 percent (World Bank 2017).

The state government, however, has implemented programs such as Mahila Samakhya Programme to improve women's status and established a semi-autonomous Gender Resource Centre (GRC) under DWCD, as a nodal agency for all gender-related initiatives. According to one stakeholder, in 2006 the GRC, with the support of NGOs, played a leading role in the development of the Nari Gaurav Niti, the Gujarat state policy for gender equity.

Several stakeholders observed that dairy cooperatives and self-help groups have played an important role in improving women's status in the state. The network of women's dairy cooperatives became a significant contributor to women's development. Women's dairy cooperatives became platforms for spreading nutrition awareness and for increasing access to maternal and child health and nutrition services; they also supported the economic empowerment of women and their families.

Looking forward

Although Gujarat witnessed remarkable improvements in child nutrition between 2006 and 2016, progress stalled between 2016 and 2019. This is illustrated by a stagnation in stunting prevalence (38.4 percent in 2016 and 39 percent in 2019) and a mixed picture on trends in IYCF practices. Improvements in household conditions continued, however, as did the decline in early marriage and women's education. On a promising note, however, coverage of health and interventions improved, suggesting that administrative capabilities, systems strengthening and a general commitment to improve direct nutrition programs remained stable. However, since improving nutrition outcomes requires actions across multiple sectors, all-out efforts are needed to invest in creating enabling household environments for good nutrition.

The analysis of factors contributing to change in nutrition outcomes, determinants and programs together with the new findings of the NFHS-5 mean this is an important time to accelerate actions to meet nutrition targets. There remains a clear and immediate need to close lingering gaps in coverage of interventions across the 1000 days, using data strategically to focus actions, close equity gaps and strengthen quality of programs, where needed. Efforts are also needed to understand and address specific constraints around infant and young child feeding, especially complementary feeding practices. Despite impressive improvements in household living conditions (electricity, water, sanitation), social determinants such as girls' education and early marriage need to now be prioritized.

Gujarat is a diverse state that covers a range of agro-ecological and economic characteristics; several districts have progressed while others lag. Since change has not been uniform, an equity-focused effort to address program reach and quality as well as underlying social determinants must be part of the overall nutrition strategy. Given the apparent stalling of progress in the 2016-2019 timeframe, there is no time to lose in accelerating actions across sectors to tackle malnutrition.

1. INTRODUCTION

In recent years, there has been an increase in global attention and political commitment to reducing undernutrition, as well as a demand for guidance on how to effectively translate nutrition-relevant policies into impacts on the ground. This has been marked by the launch of the Scaling Up Nutrition (SUN) Movement in 2010, the 2008 and 2013 Lancet Nutrition Series, the 2013 Nutrition for Growth Summit, and the 2014, 2015, and 2016 WHO Global Nutrition Reports. Given the investments that have already been made into improving nutrition, and the considerations for future investments, there is a need for learning that draws on the experiences of nutrition leaders, program implementers, and policy makers; their experiences and insights need to be used to shed light on what has or has not worked to improve nutrition outcomes in different contexts.

In 2012, the global community committed to a set of six nutrition targets to improve maternal and child nutrition, which were to be achieved by 2030. These targets include achieving a 40 percent reduction in the number of stunted children, a 50 percent reduction in anemia among women, a 30 percent reduction in low birth weight, no increase in the prevalence of childhood overweight, an increase in the rate of exclusive breastfeeding (EBF) to at least 50 percent, and a reduction of wasting to less than 5 percent and its maintenance at that level.

India comprises one-sixth of the world's population and one-third of the global burden of undernutrition. Between 2006 and 2016, India made progress in reducing stunting among children below five years; the progress, however, has been variable across states (Menon et al. 2018). There are interstate differences in stunting reduction, despite a common national policy framework for nutrition-specific and nutrition-sensitive programs. There are interstate differences in stunting reduction despite a common national policy framework for nutrition-specific and nutrition-sensitive programs. To our knowledge, there are only three subnational studies of drivers of change in nutrition outcomes in India where several policy and programmatic drivers of change in nutrition outcomes have been identified (Haddad et al. 2014; Kohli et al. 2017; 2020). Given the paucity of insights on the factors driving successful change in nutritional outcomes, including stunting at the state level in India, we conducted studies in the four states of Chhattisgarh, Gujarat, Odisha, and Tamil Nadu.

In this report, we examine the story of change in stunting over a 24-year period in the state of Gujarat. We chose to study Gujarat—along with the states of Odisha (Kohli et al. 2017) and Chhattisgarh (Kohli et al. 2020)—because between 2006 and 2016, declines in stunting in these states were higher than the national average in absolute terms.

Gujarat is situated on the west coast of India and accounts for 6 percent of the area of the country; it includes 26 districts,¹ which are subdivided into 226 blocks or *taluka*, 18,618 villages, and 242 towns. Gujarat is home to more than 60 million people, or 5 percent of India's population. With 37 percent of its population living in urban areas, it is one of the most urbanized states in India. In terms of its economy, infrastructure, industrialization, and governance, Gujarat is better positioned than many other states.

2. OBJECTIVES

1) examine changes in child stunting, known determinants of stunting and key health and nutrition interventions between 1992 and 2016; 2) assess the contribution of diverse determinants and intervention coverage changes to the changes in stunting between 2006 and 2016; and (3) interpret the changes in the context of policies, programs and other changes in the state.

¹ As of 2019, Gujarat has 33 districts; but the NFHS-4 survey was carried out in the former 26 districts.

Using diverse sources of data, we synthesized insights on how state-level leadership, policies, programs, and other changes across society came together to support the changes seen in child growth outcomes over this period and to offer insights on actions that are needed in looking ahead toward the achievement of national nutrition goals.

3. METHODS

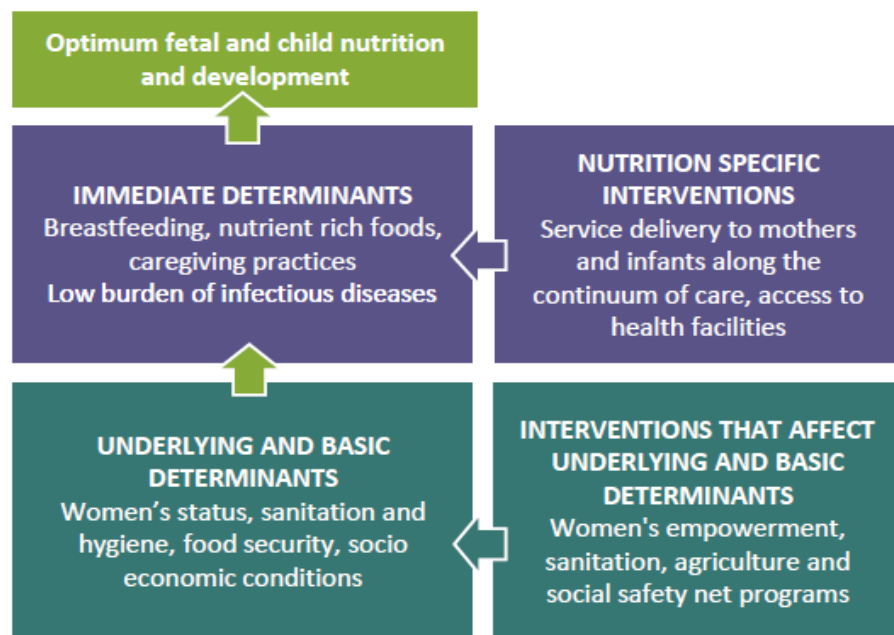
We used a variety of data sources and research methods. Using multiple rounds of data from surveys, we developed a 24-year (1992–2016) timeline of changes in stunting and its known determinants. A list of indicators was identified based on UNICEF’s conceptual framework (Figure 1); this included nutrition outcomes, determinants (immediate and underlying), and interventions:

- **Nutrition outcomes:** stunting;
- **Immediate determinants:** women’s BMI, fertility rates, infant and young child feeding (timely initiation of breastfeeding, exclusive breastfeeding, timely introduction of complementary foods, meal frequency), and health indicators (incidence of diarrhea, acute respiratory infection, and access to oral rehydration solutions);
- **Underlying and basic determinants:** women’s education, women’s social and economic empowerment, access to sanitation, electricity and drinking water, access to ICDS and health centers, and population below the poverty line;
- **Nutrition-specific interventions:** coverage of interventions during pregnancy, delivery, infancy, and childhood that are aimed at improving immediate determinants.

Specifically, we analyzed four rounds of the National Family Health Survey (NFHS–1992/1993, 1998/1999, 2005/2006, 2015/2016) (IIPS 1993; 1999; 2006; 2016) and the Annual Health Survey (where necessary). First, we examined the data on stunting reduction and changes in known drivers of undernutrition descriptively. Next, we used regression–decomposition analysis to examine the contributions of changes in known determinants of stunting between 2006 and 2016; this combines the analysis of differences in means of the explanatory variables (X) between 2006 and 2016 and regression estimates of the coefficients associated with these variables (BX) from a pooled regression model. If, for example, a determinant has a large regression coefficient (“marginal effect”) and a large change in its mean over time, then this determinant will play a large role in explaining stunting reduction over time. This method has been used widely in previous studies to examine changes in undernutrition in Nepal (Headey and Hoddinott 2015; Cunningham et al. 2017) and in other countries (Headey 2013). The decomposition analysis combined the marginal effects of the determinants of stunting estimated from national data, and changes in means of determinants in Gujarat over time.

We conducted a literature review to assess changes in policies and programs pertaining to nutrition between 1992 and 2016. The literature review had two objectives: to construct a policy timeline and analyze policy changes over the period of stunting reduction, and to gather additional literature to support overall analysis and interpretation. To construct a policy timeline and analyze policy changes between 1992 and 2016, we reviewed government program documents, key development plans, national policies, strategies, and reports. We searched electronic databases including Google Scholar and PubMed, as well as program-relevant websites.

We conducted 17 stakeholder interviews with government officials, academicians, and civil society members (Table 1) to supplement our analysis and to add experiential insights on potential reasons for changes in key programs and policies. Interviews were conducted in English and in Gujarati and transcribed into English; they were then analyzed for themes reading across the interviews. Finally, we integrated insights from all these different sources of information in an effort to interpret what drove change in Gujarat and what contributed to that change.

Figure 1. Conceptual framework for nutrition outcomes, determinants, and interventions

Source: Adapted from UNICEF (1990) and Ruel and Hoddinott (2008).

Table 1. Stakeholders interviewed

| Stakeholder type | Number |
|--|--------|
| Government (Health and Family Welfare; Women and Child Development; Food, Civil Supplies and Consumer Affairs) | 12 |
| Academia | 2 |
| Civil society and development partners | 3 |
| Total | 17 |

Source: Authors

4. FINDINGS

Gujarat, a state of 60 million people in western India, is one of the high-income states. In 2005, it was one of the fastest growing states in the country, its economic growth primarily driven by services and industries. Despite this, for several years Gujarat's progress on nutrition was slow, especially compared to other high-income states.

4.1. Nutrition and Health Outcomes and Their Determinants in Gujarat, 1992–2016

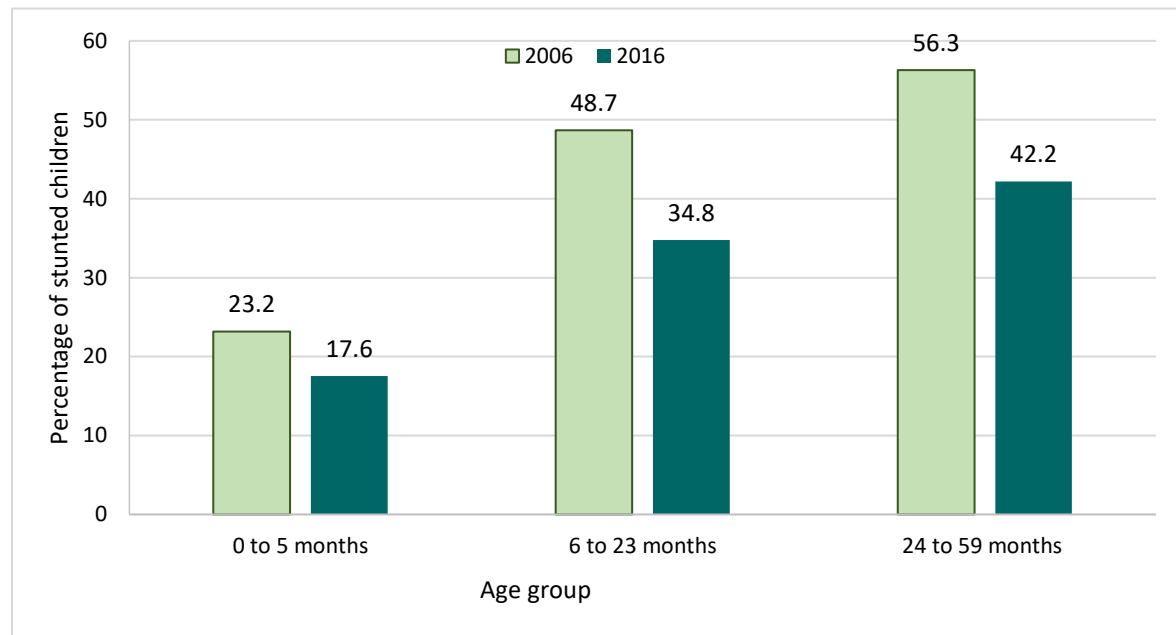
4.1.1 Nutrition and health outcomes in Gujarat, 1992–2016

Between 1992 and 2006, nutrition outcomes changed little in Gujarat (Table 2). Stunting and underweight among children below five years remained stagnant and anemia among women of reproductive age increased. Much of the success in the reduction of undernutrition among children below five years of age was achieved between 2006 and 2016; over this period, stunting and underweight declined among children below five years. During that period, while overall there was a 13 percentage point (pp) decline in stunting among children below five years of age, higher declines were observed among children 6 to 23 months (13.8 pp) and among children 24 to 59 months (14.1 pp), as compared to children under 5 months (5.6 pp); highlighting that for outcomes like stunting, improvements accumulate over the early part of the life course and are more visible in older infants.

The decline in underweight was very modest, from 43 percent in 1992 to 41 percent in 2016; it was higher than the national average (37 percent). There has been a slow decline in the prevalence of wasting in the state. It dropped from 24 to 20 percent between 1992 and 1999 and then remained stagnant at around 19 percent until 2006; by 2016 it had again increased to 27 percent. Progress on all anthropometric indicators of child nutrition then stalled between 2016 and 2019 (Box 1).

Anemia among women remains a significant public health challenge in Gujarat. Between 1998 and 2006, the prevalence of anemia among women of reproductive age (WRA) and pregnant women increased. Among WRA, anemia prevalence declined marginally between 2006 and 2016 (60 to 59 percent); during the same period, it declined from 67 to 60 percent among pregnant women. Anemia prevalence among children below 3 years of age declined from 70 percent in 2006 to 62 percent in 2016. Gujarat experienced a major decline in infant mortality rate (IMR) between 1992 and 2016, from 68 per 1,000 live births to 30; it is currently lower than the all-India average of 34.

Figure 2. Changes in stunting among children in Gujarat by age group, between 2006 and 2016



Source: National Family Health Survey–3 (2005/2006), IIPS (2006) and NFHS–4 (2015/2016), IIPS (2016).

Table 2. Changes in nutrition and health outcomes in Gujarat in comparison to national average, 1992 to 2016

| Indicators (Percent) | 1992/1993 ¹ | | 1998/1999 ² | | 2000/2005 | 2005/2006 ³ | | 2015/2016 ³ | |
|---|------------------------|---------|------------------------|-------------------|-----------|------------------------|---------|------------------------|---------|
| | India | Gujarat | India | Gujarat | No data | India | Gujarat | India | Gujarat |
| Stunting (< 3 year-old children) | n/a | 50.1 | 51.0 | 52 | No data | 44.9 | 49.2 | n/a | n/a |
| Stunting (< 5 year-old children) | n/a | n/a | n/a | n/a | No data | 47.6 | 51 | 38 | 37.9 |
| Wasting (< 3 year-old children) | n/a | 23.9 | 19.7 | 20.3 | No data | 22.9 | 19.7 | n/a | n/a |
| Wasting (< 5 year-old children) | n/a | n/a | n/a | n/a | No data | 21.0 | 19.0 | 22.0 | 27.0 |
| Underweight (< 3 year-old children) | 51.5 | 42.7 | 42.7 | 41.6 | No data | 40.4 | 41.1 | n/a | n/a |
| Underweight (< 5 year-old children) | n/a | n/a | n/a | n/a | No data | 43.7 | 45.2 | 36.6 | 40.7 |
| Children with anemia (6 to 59 months) | n/a | n/a | 74 ^a | 74.5 ^a | No data | 69.6 | 70 | 58.6 | 62.4 |
| Women (15 to 49 years) with anemia [#] | n/a | n/a | 52 | 46.3 | No data | 60.9 | 60.0 | 57.3 | 59.2 |

| Indicators (Percent) | 1992/1993 ¹ | | 1998/1999 ² | | 2000/2005 | 2005/2006 ³ | | 2015/2016 ³ | |
|---|------------------------|---------|------------------------|---------|-----------|------------------------|---------|------------------------|---------|
| | India | Gujarat | India | Gujarat | No data | India | Gujarat | India | Gujarat |
| Pregnant women with anemia [#] | n/a | n/a | 49.7 | 47.4 | No data | 62.1 | 67.4 | 55.6 | 60.1 |
| Adolescent girls with anemia [#] | n/a | n/a | n/a | n/a | No data | 71.4 | 84.6 | 61.1 | 62.0 |
| Infant mortality rate ^b | 79 | 68.7 | 68 | 62.6 | No data | 57 | 50 | 34.0 | 30.0 |
| Maternal mortality rate ^c | 424 | n/a | 540 | n/a | No data | 254 | 160 | 130 | 91 |

Source: ¹National Family Health Survey–1 (1992/1993), IIPS (1993); ²National Family Health Survey–2 (1998/1999), IIPS (1999); ³International Food Policy Research Institute calculations based on data for all children from the National Family Health Survey–3 (2005/2006), IIPS (2006) and National Family Health Survey–4 (2015/2016), IIPS (2016) data sets; [#]International Food Policy Research Institute calculations based on data for all women from the National Family Health Survey–3 (2005/2006), IIPS (2006) and National Family Health Survey–4 (2015/2016), IIPS (2016) data sets.

Note: ^a Figures are for children 6 to 35 months; ^b per 1,000 live births for the 5 years preceding the survey; ^c per 100,000 live births for the 2 years preceding the survey; n/a = information not available.

4.1.2 Changes in immediate determinants of nutrition in Gujarat, 1992–2016

The immediate determinants of child nutrition include women’s nutritional status, child feeding practices, and childhood illness. These determinants remained stagnant from the early 1990s until the early 2000s. Between 2006 and 2016, there was improvement in women’s health, infant and young child feeding (IYCF) practices, and child health, all of which are important immediate determinants of child nutrition. During this period, the proportion of women with low BMI declined from 41 to 29 percent and fertility rates declined from 2.4 to 2 percent. More work is needed to ensure that women remain physically healthy, that is, of appropriate BMI and non-anemic. Increase in overweight among women is an emerging challenge; according to NFHS–4 data in Gujarat, 24 percent of women of reproductive age were overweight, with a BMI greater than 25. This challenge is likely to increase in a rapidly urbanizing Gujarat.

Early initiation of breastfeeding was low and declined between 1992 and 2006; greater improvement was observed, however, between 2006 and 2016, during which it increased by 23 pp (29 to 52 percent). In that decade, progress was also made in exclusive breastfeeding, which increased by 8 pp (48 to 56 percent) (Table 3). There are, however, lingering gaps that need attention. Complementary feeding (CF) remains a major challenge. The timely introduction of complementary foods declined between 2006 and 2016 (from 59 percent to 52 percent). In that same decade, there was only a marginal improvement in dietary diversity, and in 2016 less than 15 percent of children consumed the recommended number of food groups for their age. There was a steep decline in minimum meal frequency from 42 to 34 percent. This calls for an examination of reasons for poor IYCF practices.

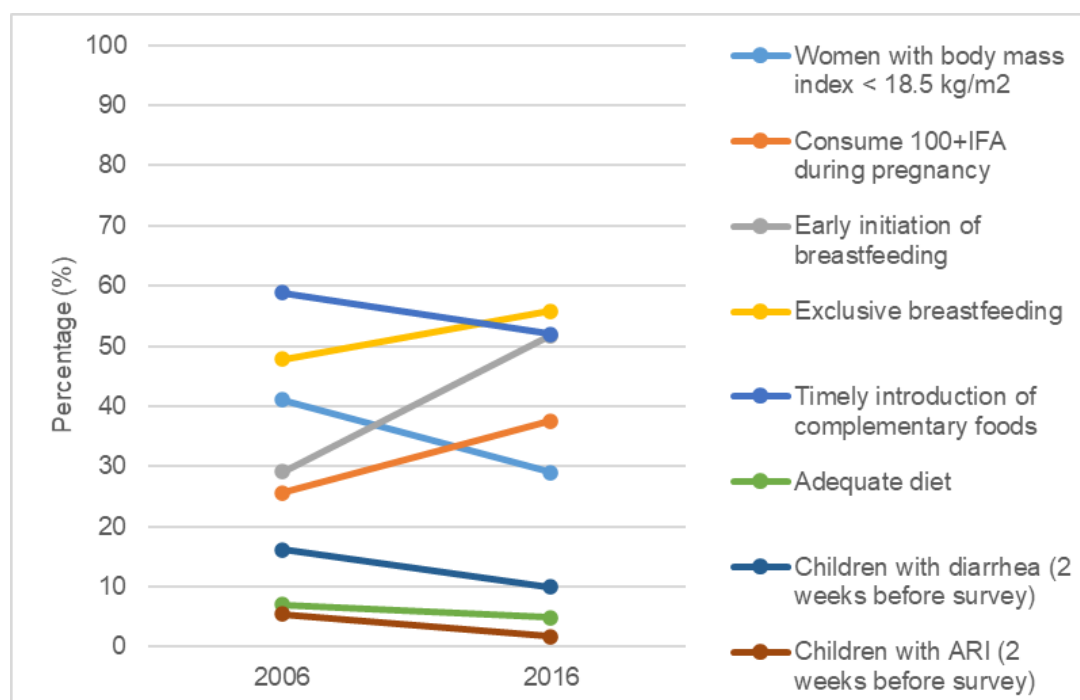
On a positive note, there was remarkable improvement in morbidity of children; in 2016, less than 10 percent of children had experienced diarrhea in the two weeks prior to the survey. The proportion of children with ARI symptoms also declined (Table 3).

Table 3. Changes in immediate determinants of nutrition in Gujarat, 1992–2016

| Indicators (Percent) | 1992/1993 ¹ | | 1998/1999 ² | | 2000/2005 | 2005/2006 ³ | | 2015/2016 ³ | |
|---|------------------------|---------|------------------------|---------|-----------|------------------------|---------|------------------------|---------|
| | India | Gujarat | India | Gujarat | No data | India | Gujarat | India | Gujarat |
| Women with body mass index under 18.5 kg/m ² | n/a | n/a | 35.8 | 37 | No data | 39.6 | 41.0 | 28.8 | 29.0 |
| Women who consumed iron and folic acid tablets/syrup during 100 or more days of their pregnancy | n/a | n/a | n/a | n/a | No data | 15.6 | 25.6 | 30.6 | 37.6 |
| Fertility rate | 2.7 | 2.6 | 2.8 | 2.7 | No data | 2.6 | 2.4 | 2.18 | 2.0 |
| Children breastfed within 1 hour of birth ^a | 10 | 13.9 | 16 | 10.1 | No data | 23.7 | 29.1 | 43.4 | 51.7 |
| Children under 6 months who were being exclusively breastfed | n/a | n/a | n/a | n/a | No data | 46.2 | 47.8 | 54.8 | 55.8 |
| Children 6 to 8 months who were receiving solid or semi-solid food with breast milk | n/a | n/a | n/a | n/a | No data | 55.2 | 58.9 | 45.2 | 51.9 |
| Breastfed children 6 to 23.9 months who were receiving minimum meal frequency | n/a | n/a | n/a | n/a | No data | 41.8 | 42.0 | 36.3 | 34.0 |
| Children 6 to 23.9 months who were receiving minimum dietary diversity | n/a | n/a | n/a | n/a | No data | 15.2 | 12.6 | 21.2 | 14.6 |
| Children who had had diarrhea in the previous two weeks ^b | 10 | 12.6 | 19.2 | 19.7 | No data | 10.7 | 16.1 | 10.6 | 9.9 |
| Children who had had acute respiratory infection in the previous two weeks ^b | 6.5 | 5.8 | 19.3 | 11.0 | No data | 6.6 | 5.4 | 3.1 | 1.7 |

Source: ¹ National Family Health Survey–1 (1992/1993), IIPS (1993); ² National Family Health Survey–2 (1998/1999), IIPS (1999); ³ International Food Policy Research Institute calculations based on youngest child data from the National Family Health Survey–3 (2005/2006), IIPS (2006) and National Family Health Survey–4 (2015/2016), IIPS (2016) data sets.

Note: ^a Indicators calculated for the previous three years (1992/1993 and 1998/1999) and the previous five years (2005/2006 and 2015/2016); ^b indicators calculated for children 0 to 47 months (1992/1993), 0 to 35 months (1998/1999), 0 to 59 months (2005/2006 and 2015/2016); n/a = information not available.

Figure 3. Changes in immediate determinants of nutrition between 2006 and 2016

Source: National Family Health Survey–3 (2005/2006), IIPS (2006) and NFHS–4 (2015/2016), IIPS (2016).

Note: IFA = iron-folic acid; ARI = acute respiratory infection.

4.1.3 Changes in the underlying determinants of nutrition in Gujarat, 1992–2016

Most of the underlying determinants of nutrition have improved, but areas of concern still exist. The proportion of women who are literate increased from 49 percent in the 1990s to 71 percent in 2016; however, in 2016, only 26 percent of women in Gujarat had 10 or more years of education (Table 4). This suggests the need for greater investment in women’s education. The proportion of women 20 to 49 years getting married before 18 years of age declined marginally between 1998 and 2006, but between 2006 and 2016, there was a remarkable decline (50 to 34 percent) (Table 4). At the same time there was only a 7 pp decline in the proportion of women 20 to 24 years getting married before 18 years of age. Even so, 48 percent of women got married before 18 in 2016; this clearly needs immediate attention (Figure 4). The reduction in early marriage among 20 to 24 years women (7 pp) is in parallel to improvements in attaining 10 or more years of education (9 pp). Similar parallel trends were observed among women of 15 to 49 years.

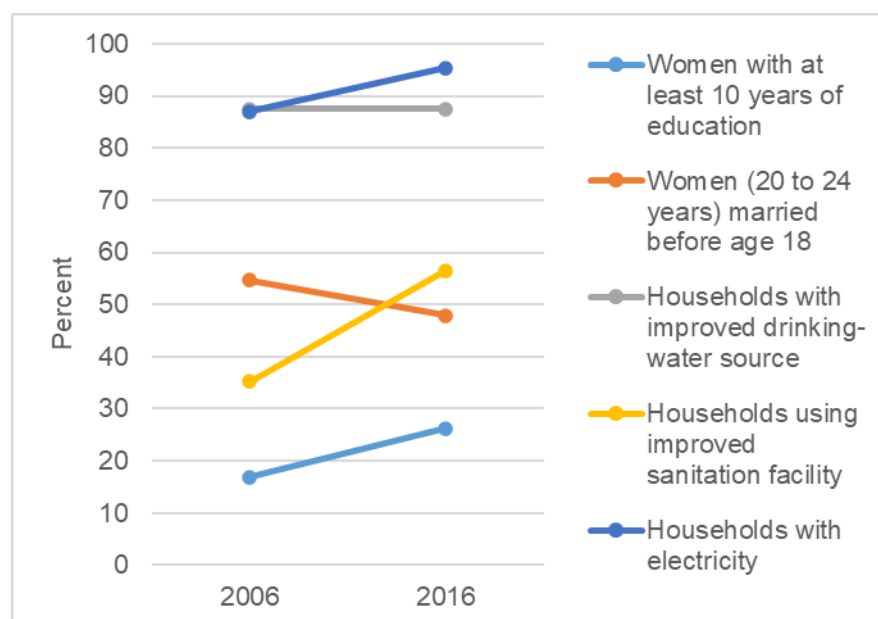
Over the last two decades, state infrastructure has improved, including roads, electricity, drinking water, and sanitation facilities. Between the 1990s and 2016, the proportion of households with access to improved drinking water, electricity and sanitation facilities increased, with 87 percent of households having access to improved drinking water. Particularly between 2006 and 2016, there has been an increase in access to improved sanitation facilities (Table 4); however, 43 percent of households still do not have access to improved sanitation facilities. The proportion of households below the poverty line has declined, with only 17 percent of households below the poverty line in 2012 (Table 4).

Table 4. Changes in underlying determinants of nutrition, 1992–2016

| Indicators (percent) | 1992/1993 ¹ | | 1998/1999 ² | | 2000/2005 | 2005/2006 ³ | | 2015/2016 ³ | |
|---|------------------------|-------------------|------------------------|-------------------|-----------|------------------------|---------|------------------------|---------|
| | India | Gujarat | India | Gujarat | No data | India | Gujarat | India | Gujarat |
| Women who are literate (15 to 49 years) | 56.7 | 48.7 | 58.2 | 50.3 | No data | 45.8 | 56.3 | 65.5 | 71.4 |
| Women with at least 10 years of education | 9.2 | 12.3 | 14.2 | 20.2 | No data | 16.1 | 16.9 | 30.8 | 26.2 |
| Women (20 to 49 years) married before the age of 18 | 64.5 | n/a | 61.1 | 50.9 | No data | 57.9 | 49.6 | 40.1 | 34.2 |
| Women (20 to 24 years) married before the age of 18 | n/a | n/a | n/a | n/a | No data | 65.4 | 54.7 | 47.8 | 47.9 |
| Households with access to improved drinking water | 68.2 ^a | 75.1 ^a | 77.9 ^a | 84.5 ^a | No data | 86.3 | 87.5 | 89.5 | 87.5 |
| Households with access to improved sanitation | 30.3 | 35.8 | 35.9 | 44.9 | No data | 22.3 | 35.2 | 40.1 | 56.5 |
| Open defecation | 69.7 | n/a | 64 | 54.9 | No data | 63.5 | 53.5 | 47.2 | 36.7 |
| Household below poverty line ⁴ | n/a | n/a | n/a | n/a | No data | 37.2 | 31.8 | 21.9 | 16.6 |
| Households with electricity | 50.9 | 76.6 | 60.1 | 84.3 | No data | 59.2 | 87.0 | 84.1 | 95.3 |

Source: ¹ National Family Health Survey–1 (1992/1993), IIPS (1993); ² National Family Health Survey–2 (1998/1999), IIPS (1999); ³ International Food Policy Research Institute calculations based on youngest child data from the National Family Health Survey–3 (2005/2006), IIPS (2006) and National Family Health Survey–4 (2015/2016), IIPS (2016) data sets; ⁴ World Bank (2005, 2012).

Note: ^a Drinking water from pump/pipe; n/a = information not available.

Figure 4. Changes in underlying determinants between 2006 and 2016

Source: National Family Health Survey–3 (2005/2006), IIPS (2006) and NFHS–4 (2015/2016), IIPS (2016).

4.1.4 Changes in the coverage of nutrition-specific interventions in Gujarat, 1992–2016

The coverage of nutrition-specific interventions has improved steadily over time, with significant change between 2006 and 2016; over that time, there has been improvement in nutrition-specific interventions related to care during pregnancy, including the proportion of women receiving antenatal care, and proportion of women receiving food supplements. Although receipt of IFA supplements has been high since the 1990s, it declined between 2006 and 2016 (82 to 77 percent) (Table 5).

Between 2006 and 2016, there has been a remarkable increase in the proportion of institutional deliveries (from 57 to 90 percent) and professionally assisted births (from 67 to 88 percent). Receipt of food supplements during lactation more than quadrupled, increasing from 11 to 48 percent between 2006 and 2016. Similar increase was observed nationally. Even so, further improvements are needed in the coverage of food supplementation during lactation.

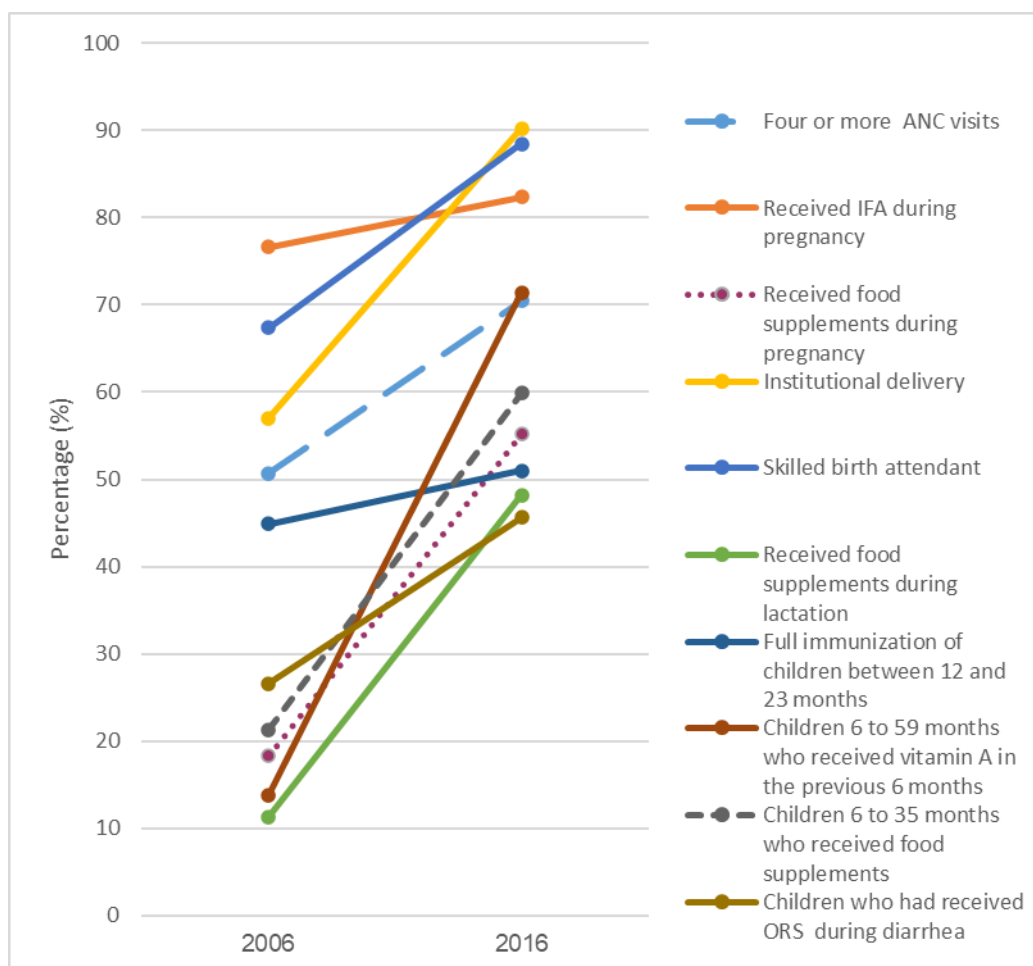
There are gaps in the coverage of interventions during early childhood. The coverage of immunization remained stagnant from the 1990s and only 51 percent children were fully immunized in 2016. Between 2006 and 2016, there was a remarkable increase in the coverage of vitamin A supplementation and food supplements for children (Figure 5).

Table 5. Changes in the coverage of nutrition-specific interventions, 1992–2016

| Indicators | 1992/1993 ¹ | | 1998/1999 ² | | 2000/2005 | 2005/2006 ³ | | 2015/2016 ³ | |
|---|------------------------|-------------------|------------------------|-------------------|-----------|------------------------|-------------------|------------------------|-------------------|
| | India | Gujarat | India | Gujarat | No data | India | Gujarat | India | Gujarat |
| Mothers who had more than four antenatal care visits for their most recent birth (%) ^a | 26.9 | n/a | 29.5 | n/a | No data | 36.9 | 50.7 | 51.0 | 70.5 |
| Women who received or bought IFA supplements during pregnancy (%) ^a | 51 | 69.3 | 58 | 78 | No data | 65.3 | 82.4 | 77.9 | 76.6 |
| Women who received food supplements during pregnancy (%) | n/a | n/a | n/a | n/a | No data | 18.7 | 18.3 | 52.6 | 55.2 |
| Women who delivered in a health facility (%) ^c | 26.1 | 36.8 | 33.6 | 46.3 | No data | 41.3 | 57.0 | 81.3 | 90.2 |
| Births assisted by a health professional (%) ^c | 33.0 | 43.4 | 42.4 | 53.5 | No data | 49.6 | 67.4 | 83.3 | 88.5 |
| Receipt of food supplements during lactation (%) | n/a | n/a | n/a | n/a | No data | 14.6 | 11.3 | 47.8 | 48.2 |
| Children 12 to 23 months who had been fully immunized (%) | 35.5 | 49.8 | 42 | 53 | No data | 43.4 | 44.8 | 62.6 | 50.9 |
| Children 6 to 59 months who had received vitamin A in the previous 6 months (%) | n/a | n/a | 17 ^d | n/a | No data | 16.6 | 13.7 | 59.3 | 71.4 |
| Percentage of children 6 to 35 months who had received food supplements (%) | n/a | n/a | n/a | n/a | No data | 22.2 | 21.3 | 55.7 | 59.9 |
| Children who had had diarrhea in the previous two weeks who had received oral rehydration solutions (%) | 17.5 ^e | 20.7 ^e | 27.0 ^f | 28.9 ^f | No data | 25.8 ^g | 26.6 ^g | 50.5 ^g | 45.6 ^g |

Source: ¹ National Family Health Survey–1 (1992/1993), IIPS (1993); ² National Family Health Survey–2 (1998/1999), IIPS (1999); ³ International Food Policy Research Institute calculations based on youngest child data from the National Family Health Survey–3 (2005/2006), IIPS (2006) and National Family Health Survey–4 (2015/2016), IIPS (2016) data sets

Note: ^a Figures reported for the previous three years (1992/1993, 1998/1999) and for the previous five years (2005/2006 and 2015/16); ^b Indicator calculated for four or more ANC visits; ^c Figures reported for the previous four years (1992/1993, 1998/1999), and for the previous five years (2005/2006 and 2015/16); ^d children 12- to 35 months; ^e indicators calculated for children 1 to 47 months (1992/1993); ^f indicators calculated for children 1 to 35 months (1998/1999); ^g indicators calculated for children 0 to 59 months (2005/2006 and 2015/2016); n/a = information not available.

Figure 5. Changes in the coverage of nutrition-specific interventions between 2006 and 2016

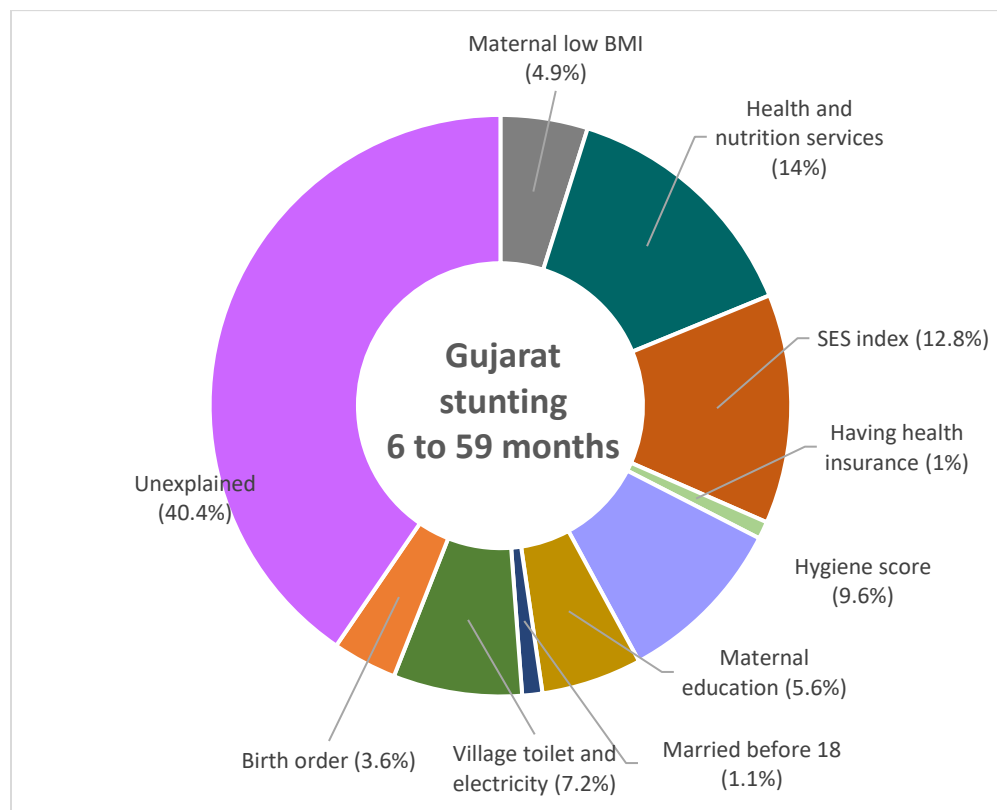
Source: National Family Health Survey–3 (2005/2006), IIPS (2006) and NFHS–4 (2015/2016), IIPS (2016).

Note: ANC = antenatal care; IFA = iron-folic acid; ORS = oral rehydration solution.

4.2. Determinants of Changes in Stunting in Gujarat, 2006–2016

There was a 13 pp decline in stunting in Gujarat between 2006 and 2016, making it one of the leading states in India in stunting decline. Our analysis indicates that improvements in health and nutrition services (14 percent), improvements in socio-economic status (SES) (12.8 percent), maternal BMI (4.9 percent) and maternal education (5.6 percent), hygiene (9.6 percent), improved village sanitation and increased access to electricity (7.2 percent), and access to health insurance contributed to actual changes in stunting among children 6 to 59 months of age. At the same time, our analysis only explained 60 percent of the actual change seen in stunting over this period; this suggests that there are additional factors that could be contributing to the changes which are not being captured in this analysis.

Figure 6. Factors contributing to changes in stunting among children 6 to 59 months, between 2006 and 2016



Source: National Family Health Survey–3 (2005/2006), IIPS (2006) and NFHS–4 (2015/2016), IIPS (2016).

Note: Values are percent shares of the change; SES = socio-economic status; BMI = body mass index.

Based on this analysis, we selected priority areas for policy analysis and stakeholder interviews to understand what factors could have contributed to 1) advancements in nutrition and health services; 2) improvement in SES; 3) improvements in care for women.

4.2.1. Advancements in nutrition and health policies and programs in Gujarat

Between 1992 and 2016, several programmatic changes took place in ICDS and health programs at the national and state levels; these changes were aimed at expanding coverage of interventions and improving quality. Innovations were introduced at the state level along with implementing the national mandate. Many state-level initiatives to support implementation of the interventions started between 2006 and 2016.

ICDS program: When ICDS was launched in Gujarat in 1975, it was under the Department of Health and Family Welfare, a situation that was unique to the state.

In 2001, major programmatic changes were initiated in ICDS at the national level, following a Supreme Court directive to universalize the program. In Gujarat, at the same time, the process of moving ICDS to DWCD was underway; it was completed by the year 2002. In 2004, the Supreme Court reiterated the directive to universalize ICDS and pointed out that Gujarat needed as many as 51,990 more Anganwadi Centers (AWCs) if it was to universalize ICDS. The number of operational AWCs increased from 37,415 in 2005 to 48,617 in 2010, and by 2014 had increased to 52,065. Between 2002 and 2003 and 2011 and 2012, the ICDS budget increased by 453

percent and the overall DWCD state budget increased by 892 percent. In 2007, Aapno Taluko Vibrant Taluko (ATVT) was initiated to decentralize and promote local ownership of administration at the taluka (lowest administrative) level for rapid decision-making and better supervision of ICDS.

In 2010, the state DWCD released guidelines for a fixed day of the month (fourth Friday) celebration of Anna Prashan Diwas (initiation of complementary feeding) at AWCs. The guidelines included recipes for complementary foods. Between 2014 and 2016, several initiatives were undertaken under the Chief Minister's leadership, under the auspices of the Gatisheel Gujarat (Dynamic Gujarat) program.

Health program: The National Nutrition Policy was accepted by the Government of India (GOI) in 1993; only a few years later, in 1998, Gujarat introduced its own state nutrition policy. Between 1990 and 2000, the DHFW initiated centrally funded programs that targeted lactating and pregnant women (Safe Motherhood and Child Survival Programme) and children (the Universal Immunization Programme). In 1997, the World Bank-funded Reproductive Child Health Programme Phase-1 (RCH-I) was launched nationwide—including in Gujarat—to bring down IMR and MMR and to increase coverage of antenatal care, institutional delivery, and immunization of children.

In 2005, at the national level, the Reproductive and Child Health Programme Phase-2 (RCH-II) was launched to ensure a decline in total fertility rate (TFR), IMR, and MMR. At the same time, the National Rural Health Mission (NRHM) was launched to provide accessible, affordable, and quality healthcare to the rural population.

At the state level, structures were set up to ensure that health program goals were achieved. In 2005, Gujarat instituted the state health mission with the goal of reducing IMR and MMR, and a State Program Management Unit was established as its secretariat. The State Health Society (SHS), headed by the Chief Secretary, was formed as a central planning, coordinating, monitoring, and financing unit; all the other societies in the purview of DHFW were consolidated under this one unit. In 2015, the Gujarat government undertook the state-level implementation of the National Urban Health Mission; its earlier urban project was subsumed into it. The State Health Society, the state health mission, and district-level missions and health societies were then reconstituted.

Several programs were initiated under the NRHM; these included the Janani Suraksha Yojana (JSY) to promote institutional deliveries, facility-based integrated management of neonatal and childhood illness, and home-based newborn care. In 2005, under the Chiranjeevi Yojana program, the Government of Gujarat Health Department piloted a public-private partnership (PPP) to contract private health providers to provide delivery care to the poor in rural areas. Private practitioners (obstetricians and gynecologists) were reimbursed for conducting institutional deliveries and for providing immediate postpartum care to BPL women. The pilot was launched in five backward districts: Banaskantha, Dahod, Kachchh, Panchmahal, and Sabarkantha; in 2006, it was scaled up to the entire state. An evaluation of the scheme in Dahod showed that it effectively targeted the poor for whom it was meant and that there was a general satisfaction with the scheme, although its utilization by the poor varied (Bhat et al. 2009).

In 2007, Mamta Abhiyan was launched in Gujarat to facilitate convergent actions between the DWCD and the DHFW. It was a fixed-day, fixed-place, once-a-month program where auxiliary nurse midwives (ANMs), Accredited Social Health Activists (ASHAs) and Anganwadi Workers (AWWs) jointly offered antenatal and postnatal care, immunization, and growth monitoring

services. Under this program, UNICEF supported a pilot in Valsad District which aimed to align the geographic areas of ICDS and health, facilitate the coordinated delivery of health, nutrition, and development services, and improve their coverage; after the success of this pilot, the synchronization of geographic boundaries for ICDS and health service delivery was implemented throughout the state. Primary Health Center and AWC staffing was organized such that there was a cohesive ICDS and health team for each cluster of villages.

In 2009, the Bal Sakha Scheme was introduced; under this scheme, private pediatricians provided care to underprivileged newborns during their first month of life (Gujarat, Health and Family Welfare Department 2019). In 2010, the tracking tool E-Mamta was launched to identify and fill gaps in maternal and child health services in both urban and rural areas. In 2014, the state initiated a medical scheme called Mukhyamantri Amrutum Yojana to provide cashless, quality medical and surgical treatment to BPL families.

In 2012, the Gujarat State Nutrition Mission (GSNM), led by the DHFW, was set up to establish a platform for coordinating and integrating the efforts of key government departments concerned with nutrition, health, education, and water and sanitation; its aim was to prevent and reduce malnutrition among adolescents, pregnant and lactating women, and children below six years of age (with a special focus on the first 1,000 days). The GSNM strategy focused on preventive and curative approaches to alleviating malnutrition. Preventive aspects included community mobilization, behavior change communication, and awareness campaigns with a focus on the promotion of critical nutrition and health interventions. The curative approach focused mainly on the management of severe acute malnutrition (SAM) and moderate acute malnutrition (MAM), the functioning of Nutrition Rehabilitation Centers (NRCs), joint organization of Mamta days, and micronutrient supplementation. The preventive aspect of malnutrition control is under the purview of the DWCD. With UNICEF's support, SAM and MAM management were given considerable attention in the state and both community-based and institution-based rehabilitation protocols were developed.

Multiple initiatives were put in place to ensure pregnancy care, safe deliveries, and emergency care. The Mamta Ghar (birth waiting home) was introduced to provide high-risk pregnant women from remote areas with a place to stay such that they could have ready access to care when required. The Mamta Doli initiative was introduced to reduce transportation-related delays in reaching health facilities for deliveries; this was implemented in collaboration with village health and sanitation committees. The intent of both programs was to reduce MMR.

Overall, Gujarat used opportunities that arose from the expansion of national-level programs to strengthen state systems; it then introduced innovations to improve the coverage of interventions. Among the stakeholder interviewed, primarily senior government officials and development partners, noted multiple factors contributing to building ICDS and health programs in Gujarat. These included leadership, funding, innovations, champions of nutrition, and partnerships with academia and NGOs (Table 8).

Stakeholders mentioned that political and bureaucratic leadership facilitated program implementation. In 2005, state leaders were shocked by the malnutrition status as indicated by the NFHS-3; they found it to be unacceptable and began to put in place measures to address it effectively. The topic of malnutrition became a prominent issue within the public discourse and key public figures became catalysts in the improvement of nutrition status (Fiedler et al. 2012). Capable and sensitized bureaucrats were able to effectively use resources from the NRHM and set up systems. RCH-I, RCH-II, and NRHM resources were used to expand coverage, increase human resources, improve infrastructure (including that of AWCs and village health centers),

improve training, and provide flexi-funds to block-level officials for investment in innovations. Several stakeholders emphasized that for many schemes the state government used its own funds to augment those from the center; financial support was also extended by industrialists to run hospitals and for the adoption of a cluster of health or Anganwadi Centers. Several stakeholders identified Dr. Amarjeet Singh and Dr. Vikas Desai as being champions for improvements in nutrition, noting that they had played a key role in ensuring the prominence of nutrition in health programs and that they had provided leadership in the immediate implementation of programs. Bureaucratic stability also facilitated implementation. One respondent commented that, *“even if senior-level officials (secretaries, commissioners) change, the next level (deputy directors as in DWCD); or additional/joint Directors in DHFW do not change frequently; [they are]—in fact are quite stable in their positions for reasonable periods of time; hence actual field-level functioning is not much affected.”*

Implementation systems were strengthened as well. One stakeholder mentioned that in 2001, unlike in many other states, Gujarat had instituted a training cell in the ICDS. Over the years, trainings were streamlined, biometric technology was used to track attendance, and resources and infrastructure for training improved. Implementation also improved; vacant positions were filled, and new posts were created as the health and nutrition programs expanded. Several stakeholders mentioned innovative schemes initiated between 2000 and 2010 that had improved access to care; the Chiranjeevi Yojana was cited in particular as being a scheme that increased the proportion of safe deliveries through improved access of the poor to specialized care by obstetricians. In a unique state-level effort led by the Department of Food, Civil Supplies and Consumer Affairs, fortification of oil with vitamins A and D (2005) and fortification of wheat flour with iron and folic acid (2006) were initiated; this was first done in the open market and subsequently fortified flour and oil began to be used in ICDS and mid-day meal food supplementation. Steps were taken to ensure that oil fortification could be implemented. Emphasizing the leadership role of the secretary of the Department of Food, Civil Supplies, and Consumer Affairs, Mr. S. K. Nanda, one stakeholder stated that, *“Bureaucrats sometimes blame the political wing for not being able to work; here was a leader who successfully overcame hurdles from the food industry and ensured that micronutrient fortification of foods became mandatory.”*

There was a lack of consensus among stakeholders as to whether ICDS had worked well under DHFW or whether moving it to DWCD had in fact been beneficial. Stakeholders in the DWCD perceived that the migration of ICDS from DHFW to DWCD facilitated the development of AWC infrastructure and increased efforts to increase coverage of services; stakeholders in the DHFW, however, perceived that implementation had been better when ICDS was part of the health department. One stakeholder commented that, *“When [services] are administratively under two different departments, there is a breach in continuity of services; coordination suffers; after all, beneficiaries are common to both.”*

Convergence between ICDS and DHFW continued, however; it was facilitated by programs such as Mamta Abhiyan and IMNCI. Reflecting on how IMNCI strengthened coordination between AWWs and ANMs, one respondent commented that, *“Both health workers and AWWs are coming to the same center to learn about IMNCI. Medical college teachers are teaching them. IMNCI was a big boost, a policy change, something substantial to actually show integration.”* Stakeholders also mentioned that as ICDS was a new department under DWCD, the leadership enthusiastically supported the expansion and quality of ICDS and its programs through allocation of resources.

Partnerships with NGOs and academia facilitated the strengthening of programs. Between 2000 and 2016, the government had set up mechanisms for systematically engaging NGOs as partners

in the implementation of its programs and for support to women's empowerment initiatives. A state NGO cell was set up in the DHFW under the state health mission. An NGO coordinator oversaw coordination and implementation of RCH (and later NRHM) interventions (Gujarat, Health and Family Welfare Department 2018) and the DWCD handed over to the NGO the management of a cluster of AWCs along with financial resources.

The state government encouraged partnerships with academic institutions, including departments of preventive and social medicine (PSM) and departments of food and nutrition. Program support units were established in all the PSM departments; they received state resources to help the government with research, monitoring, and technical expertise. The Department of Foods and Nutrition, M.S. University of Baroda, has provided technical support to both DHFW and DWCD, especially for anemia control and ICDS interventions, while the Department of Food Science at the Anand Agricultural University has functioned for many years as one of the state's Anganwadi Training Centers. Various mechanisms for improved monitoring and service provision were also initiated, including regular program reviews by the chief secretaries.

4.2.2. Improvements in socio-economic status in Gujarat

Gujarat is one of the states that benefited the most after economic reforms were introduced in India in 1991/1992. After the reforms, the state performed better than India's other states in a number of sectors, including forestry and logging, manufacturing, electricity, gas and water supply, transport, storage, trade and hotels (Dholakia 2007).

In 2005, Gujarat was one of the fastest growing states in the country and its growth was driven mainly by services and industry. From 2005 onward, poverty reduction occurred at a rate faster than the national average; even though it was declining sharply, however, it was still behind other advanced states (World Bank 2017). The proportion of population below the poverty line declined from 38 percent in 1984 to 17 percent in 2012 (ibid). Although Gujarat is one of the states where the proportion of poor people is relatively small, there are parts of the state where more than a third of the population is below the poverty line; the eastern districts of the state, particularly, have high rates of poverty (ibid).

A few respondents mentioned economic progress as being the key underlying contributor to overall progress, including in nutrition. Progress was linked to investments in infrastructure, which in turn helped improve access to services. One respondent commented, *"increase in income does not automatically mean that family nutrition will improve. For example, in Khera, dairy farmers sell milk and buy consumables rather than better food for children or healthcare"*. Another mentioned that, *"economic development also has a cost – look at the increase in overweight and NCDs [non-communicable diseases]. Unless it is accompanied by awareness, it may not benefit as expected."*

4.2.3. Improvements in care for women in Gujarat

Women's education and empowerment are recognized as being important contributors to women and child nutrition, and the Government of Gujarat has implemented programs to improve these aspects. The Mahila Samakhya Programme, which began in Gujarat in 1989, was geared toward improving women's education and upliftment. The program provides access to financial and legal training and also makes other resources available to women (India, Ministry of Human Resource Development 2016). An evaluation of this program in 2014 revealed that it had been successful in mobilizing socially marginalized women and supporting women's education; it was also noted that Gujarat was one of the states that had been successful in implementing this program (Indian

Institute of Management 2014). While the program was losing its importance in other states, Gujarat invested its own resources and continued it.

In 2004, Gujarat established a semi-autonomous Gender Resource Center (GRC) under the DWCD which had a mandate to do training, advocacy, and research. The GRC collaborates with academic departments and NGOs on gender-related issues and programming in general, raising issues on behalf of underprivileged women; it also coordinates the efforts of different sections of society and the government and acts as a nodal agency for all gender-related initiatives in the state. According to one stakeholder, in 2006 the GRC played a leading role (with the support of NGOs like CHETNA) in developing Gujarat's policy for gender equity, the Nari Gaurav Niti.

Overall, there has been mixed progress for women in Gujarat: MMR has improved and is now lower than the national average; the proportion of women with more than 10 years of education is below the national average; between 2005 and 2012, there has been a sharp decline in women's participation in the labor force (particularly in rural areas) from 62 to 38 percent (World Bank Gender Brief).

Several stakeholders observed that dairy cooperatives and self-help groups have played an important role in improving women's status in the state. The network of women's dairy cooperatives became a significant contributor to women's development. Women's dairy cooperatives became platforms for spreading nutrition awareness and for increasing access to maternal and child health and nutrition services; they also supported the economic empowerment of women and their families.

4.3. Political Transitions in Gujarat (1992–2016)

Prior to 2000, there were frequent changes in Gujarat's state leadership. For two months in 1996, President's rule was imposed, but stability was then achieved between 1996 and 1998. The Bharatiya Janata Party (BJP) came into power in 2000 and continues to be in power until now. Although there have been changes in chief ministerial leadership during this period, the party has remained in power in the state, lending it political stability. Despite frequent transfers of senior bureaucrats such as commissioners and secretaries, there has been stability in terms of deputy-level officials in state departments and district-level officials; as a result, to a large extent program implementation continues as planned.

In addition to political leadership, steady implementation of programs and policies has been supported by bureaucratic leadership in the state's Department of Health and Family Welfare, Department of Women and Child Development, and in the Department of Food, Civil Supplies and Consumer Affairs. Several stakeholders considered Dr. Amarjeet Singh to be a dynamic leader who facilitated the implementation of various programs under the DHFW.

4.4. Summary

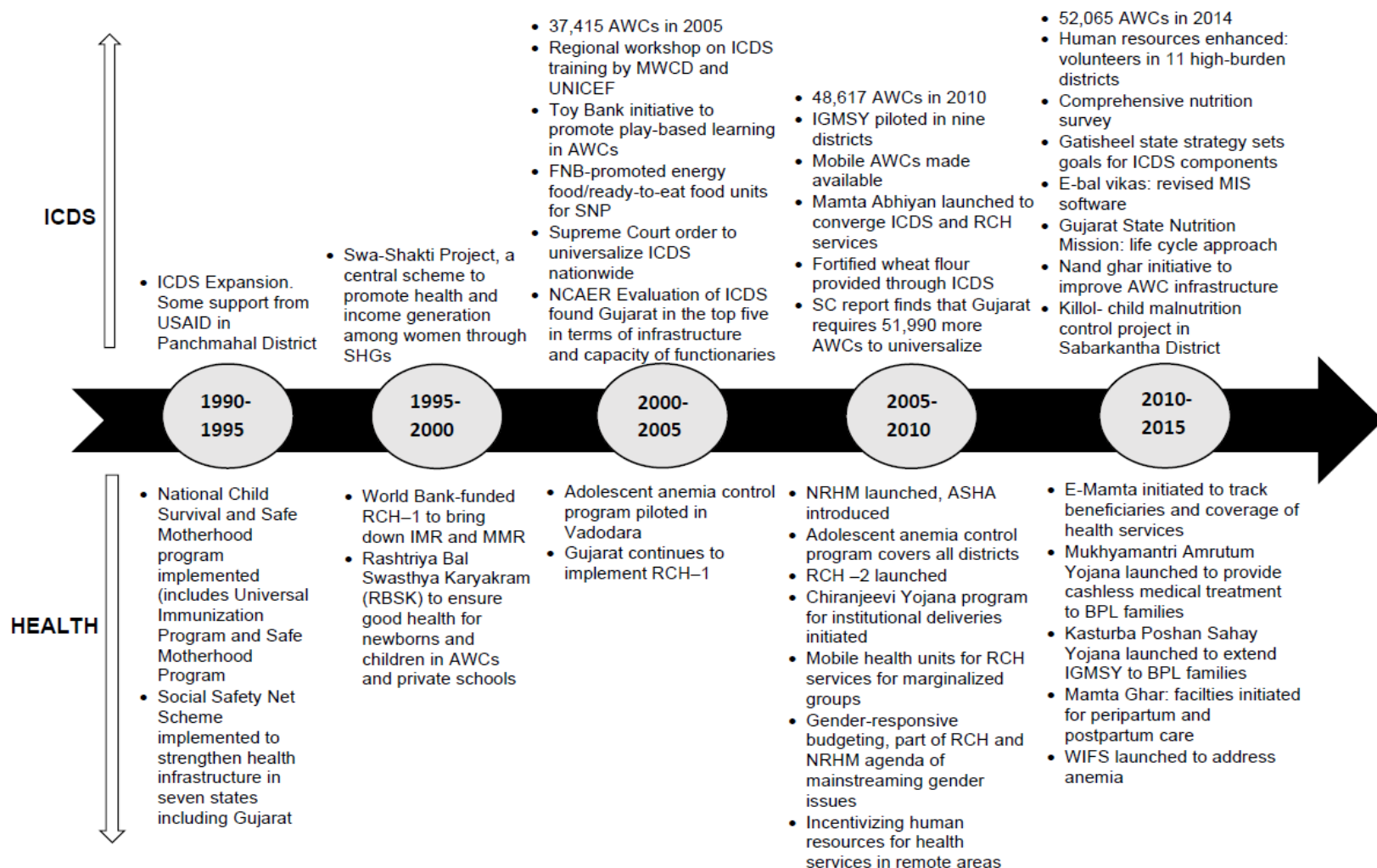
In the decade between 2006 and 2016, Gujarat was one of the states with the highest decline in stunting in absolute terms, and the decline was higher than the national average. Higher declines in stunting were observed among older children (6 to 23 months and 24 to 59 months) compared to children 0 to 5 months; this highlighted that for outcomes such as stunting, improvements accumulate over the early part of the life course and are more visible in these older infants. Our analysis indicates that improvements in health and nutrition services, SES, maternal BMI and maternal education, hygiene, village sanitation and electricity and access to health insurance contributed to actual changes in stunting among children 6 to 59 months of age.

Programmatic expansion took place at the national level between 1990 and 2000; both ICDS and health programs took initiatives to improve coverage of nutrition and health interventions. Gujarat adopted these expansions and strengthened delivery systems to improve safe motherhood; it focused on strengthening antenatal care and on increasing institutional deliveries and the coverage of immunization programs. In 2005, the National Rural Health Mission (NRHM) was launched to extend the coverage of services to rural areas, and Gujarat launched the state health mission to support state-level implementation. Until the mid-2000s Gujarat followed the national mandate; in addition, between 2005 and 2015, Gujarat implemented several state-level innovations to improve delivery care for the rural poor and for women in remote areas, to ensure the continuity of services for women and children, and to ensure convergence between the Health Department and the ICDS Department.

Together with national program expansion and state innovations, there was an expansion of health and nutrition interventions, with champions for nutrition in other sectors playing a key role in ensuring attention to nutrition. Partnerships with NGOs and academia further facilitated the strengthening of programs.

This expansion and strengthening of services took place under the direction of capable and sensitized bureaucrats who were able to use resources effectively and set up efficient systems. Resources from national programs were used to expand coverage, increase human resources, improve infrastructure and training, and provide flexi-funds to block-level officials for investment in innovations. Particularly between 2005 and 2015, changes in stunting resulted from a convergence of multiple factors; these included improvements in the coverage of health and nutrition interventions, in the economy, and in maternal factors. To continue its progress on stunting, the state must focus on improving coverage of all health and nutrition interventions along with quality and equity and it must continue to improve maternal determinants such as age at marriage, education, and health. The IYCF practices, particularly complementary feeding practices, are also suboptimal and need immediate attention.

Figure 7. A snapshot of Integrated Child Development Services (ICDS) and health programs in Gujarat, 1990–2015



Source: Authors.

Note: The interventions identified in bold are state-specific innovations; SHG = self-help groups; RCH-1 = Reproductive and Child Health Programme Phase-1; ICDS = Integrated Child Development Services; AWC = Anganwadi Center; MWCD = Ministry of Women and Child Development; FNB = Food and Nutrition Board; SNP = Special Nutrition Programme; NCAER = National Council of Applied Economic Research; NRHM = National Rural Health Mission; ASHA = Accredited Social Health Activist; MIS = management information system; BPL = below poverty line; WIFS = weekly iron and folic acid supplementation.

Table 6. Integrated Child Development Services (ICDS): Program evolution in Gujarat, 1990–2015

| 1990–1995 | 1996–2000 | 2001–2005 | 2006–2010 | 2011–2016 |
|-------------------------------|---|---|--|---|
| ICDS projects and AWCs | | | | |
| | | 2005: Number of operational ICDS projects: 227 Number of operational AWCs: 37,415. ¹ | 2010: Number of operational ICDS projects: 336 Number of operational AWWs: 48,617. ² | 2014: Number of operational ICDS projects: 336 Number of operational AWCs: 52,065 ³ 2016: ICDS scheme universalized to 53,029 AWCs in 336 blocks. ⁴ |
| ICDS/DHFW | | | | |
| | 1998: Swa-Shakti Project, a central scheme supported by World Bank and IFAD to promote health, literacy, skill development, and income generation among women through self-help groups in nine states in India. ⁵ | 2001: National evaluation of ICDS by the National Council of Applied Economic Research found that Gujarat was among the top five states in terms of infrastructure, inventory, and capacity of functionaries. ⁶ 2001: The Supreme Court passed an order to universalize ICDS nationwide. ⁷ 2001/2002: ICDS transferred to DWCD in 2002; transition continued until 2003. 2002: Toy Bank initiative launched by state for play-based learning by 1,700,000 children in 25,000 AWCs ⁸ | 2006: Second edition of National Guidelines on IYCF ¹⁰ 2006: Gujarat government to provide fortified wheat flour through ICDS. ¹¹ 2007: Supreme Court issued directive on expansion of ICDS. ¹² 2007: Mamta Abhiyan launched by state to converge services of ICDS and RCH, with additional focus on universal coverage of growth monitoring, preventive health services to women and children, and nutrition counselling. ¹³ 2009: Ministry of Women and Child Development sanctioned 1000 INR per <i>anganwadi</i> center per year toward flexi funds. ¹⁴ 2010: Mobile Anganwadis made available in all districts of Gujarat to bring services to hard-to-reach areas. ¹⁵ | 2011/2012: Indira Gandhi Matritva Sahyog Yojana piloted in Bharuch and Patan Districts (following national pilot in 2010). ¹⁷ 2012: State initiative under ICDS to improve infrastructure for AWCs under a new name, Nand Ghar: Rs. 551.91 crore allocated in 2012/2013 to build 12,045 such Nand Ghars. ¹⁸ 2012: Revised MIS software available to track Anganwadi progress: e-bal vikas. ¹⁹ 2012: ICDS Society set up to monitor implementation of ICDS in Gujarat. ²⁰ |

| 1990–1995 | 1996–2000 | 2001–2005 | 2006–2010 | 2011–2016 |
|-----------|-----------|--|--|---|
| | | <p>2004: Supreme Court passes another order to reiterate universalization.⁷</p> <p>2004–2005: Kishori Shakti Yojana (KSY) expanded to 40 blocks to improve the nutrition of adolescent girls.⁹</p> | <p>2010: Rajiv Gandhi Scheme for Empowerment of Adolescent Girls piloted in nine districts of Gujarat.¹⁶</p> | <p>2014: Gatisheel Gujarat launched: A state-level strategy to improve state development by setting department-specific goals.</p> <p>2014: Comprehensive Nutrition Survey in Gujarat (CNSG) initiated: data on nutritional status and IYCF, and on socio-economic characteristics including access to agricultural land, ICDS, and food security.²¹</p> <p>2016: CNSG was released in June at Gandhinagar by Minister of State.²¹</p> <p>2016: Training of trainers on Early Childhood Care and Education (ECCE) for all District Program Coordinators.²²</p> |

Source:¹ India, Ministry of Women and Child Development (2006a), *Annual Report*;² India, Ministry of Women and Child Development (2011), *Annual Report*

³ India, Ministry of Women and Child Development (2015), *Annual Report*;⁴ India, Ministry of Women and Child Development (2017), *Annual Report*;⁵ Singh (2007)

⁶ Gupta and Gumber (2001);⁷ Saxena and Mander (2006);⁸ India, National Institute of Public Cooperation and Child Development (2006);⁹ India, Ministry of Women and Child Development (2005), *Annual Report*;¹⁰ India, Ministry of Women and Child Development (2006b), *National Guidelines on Infant and Young Child Feeding*;¹¹ Fiedler et al. (2012);¹² India, Supreme Court of India (2007);¹³ Karkar (2013);¹⁴ India, Ministry of Women and Child Development (2009), *Provision of Flexi fund at the Anganwadi level under the ICDS Scheme*;¹⁵ Gujarat, *Chief Minister's Office (2011)*;¹⁶ India, Ministry of Women and Child Development (2010), *Approval of Rajiv Gandhi Scheme for Empowerment of Adolescent Girls – SABLA*;¹⁷ Gujarat, Department of Women and Child Development (2011), *Indira Gandhi Matritva Sahyog Yojana*

¹⁸ Gujarat, Chief Minister's Office (2012);¹⁹ Gujarat, Department of Women and Child Development Department (n.d), *E-Bal Vikas*;²⁰ Gujarat, Department of Women and Child Development Department (n.d), *Setting up of Integrated Child Development Services Society*;²¹ IIPS (2015), *Comprehensive Nutrition Survey in Gujarat (CNSG)*

²² Gujarat, Department of Women and Child Development (n.d), *Early Childhood Care & Education*.

Note: ICDS = Integrated Child Development Services; AWW = Anganwadi Worker; IFAD = International Fund for Agricultural Development; DWCD = Department of Women and Child Development; AWC = Anganwadi Center; NIPCCD = National Institute of Public Cooperation and Child Development; RCH = reproductive and child health.

Table 7. Health program evolution in Gujarat, 1990–2015

| 1990–1995 | 1996–2000 | 2001–2005 | 2006–2010 | 2011–2016 |
|---|--|---|--|---|
| <p>1992: National Child Survival and Safe Motherhood program (CSSM) includes both Universal Immunization Programme and Safe Motherhood Programme, implemented nationwide, including in Gujarat.¹</p> <p>1993: Central Council of Health and Family Welfare conducted its third national conference and announced the Social Safety Net Scheme to strengthen rural health infrastructure in 90 weak districts in 7 states, including in Gujarat; the scheme was designed to bring down maternal and infant mortality rates and reduce the crude birth rate.²</p> | <p>1997: World Bank–funded Reproductive Child Health Programme Phase–I (RCH–I) was launched nationwide, including in Gujarat to address IMR and MMR.³</p> <p>1997: Rashtriya Bal Swasthya Karyakram was launched to ensure good health for children up to 18 years; programs include health screening, primary care, issuing of health and referral cards, and referral services.⁴</p> | <p>2000: National adolescent anemia control program initiated as a pilot in Vadodara; IFA tablets provided on a weekly basis to 69,000 girls in 426 schools.⁵</p> <p>Gujarat continues to implement RCH–I</p> | <p>2005: Adolescent anemia control program expanded to all 25 districts in Gujarat, covering 1.07 million girls in 7,462 schools.⁵</p> <p>2005: NRHM (now referred to as NHM) launched nationwide.⁶</p> <p>2005: Gujarat Health Mission launched is to achieve the goals of the NRHM.⁷</p> <p>2005: RCH–II launched nationwide with added aims to promote adolescent health.⁸</p> <p>2005: Chiranjeevi Yojana—a state-level public–private partnership (PPP) model—was launched in parallel to the JSY, to provide safe delivery and emergency obstetric care; pilot projects were carried out in 11 districts of Gujarat.⁹</p> <p>2006: Chiranjeevi Yojana was scaled up to the entire state.⁹</p> <p>2005/2006: Mobile health units were set up to expand access, reach, and quality of RCH services to marginalized communities.</p> <p>To expand service reach and reduce health disparities in tribal, coastal and difficult pockets, the state invested additional resources in these areas; Service providers were incentivized to work in the remote areas. Flexi-time approach for service</p> | <p>2010: E-Mamta (Mother and Child Tracking System) launched by State Rural Health Mission, Gujarat, with the aim of reducing IMR and MMR; this tracking tool identifies gaps in maternal and child health services in urban and rural areas.¹¹</p> <p>2007: The Mamta Nondh (Record) component of Mamta Abhiyan was launched. It connects the Mamta card given to women upon pregnancy registration with E-Mamta.¹²</p> <p>2012: Mukhyamantri Amrutum (MA) Yojana launched to improve access to quality medical and surgical care and hospitalization for BPL families.¹³</p> <p>2012: Gujarat State Nutrition Mission launched to address the curative and preventive aspects of malnutrition control.¹⁴</p> <p>2012: Kasturba POSHAN Sahay Yojana, a conditional cash transfer program modeled on the IGMSY, and extended to all BPL pregnant and lactating women; there are no limits on age or number of children.¹⁵</p> |

| 1990–1995 | 1996–2000 | 2001–2005 | 2006–2010 | 2011–2016 |
|-----------|-----------|-----------|-----------|--|
| | | | | <p>2012-13: Mamta Ghar (birth waiting home): introduced in 2012/2013 to address maternal death (peripartum and early postpartum) especially among women in remote/internal areas.¹⁶</p> <p>2013: Weekly Iron and Folic Acid Supplementation (WIFS): launched in 32 states including Gujarat to address anemia.¹⁷</p> |

Source: ¹ World Bank (1997); ² India, Ministry of Health and Family Welfare (1993), *Third Conference of Central Council of Health and Family Welfare*; ³ World Bank (2005); ⁴ Gujarat, Department of Health and Family Welfare (n.d) *School Health—Rashtriya Bal Swasthya Karyakram*; ⁵ Kotecha, Nirupam, and Karkar (2009); ⁶ India, Ministry of Health and Family Welfare (2012) *National Rural Health Mission: Framework for Implementation 2005-12*; ⁷ Gujarat, Department of Health and Family Welfare (2005), *State Health Mission Gujarat: Institutional Mechanisms*; ⁸ India, Ministry of Health and Family Welfare (2006), *Implementation Guide on RCH II Adolescent, Reproductive, Sexual Health Strategy*; ⁹ Gujarat, Department of Health and Family Welfare (2005), *Chiranjeevi Yojana*; ¹⁰ India, Ministry of Health and Family Welfare (2009), *Directory of Innovations Implemented in the Health Sector*; ¹¹ UNICEF (2013); ¹² Gujarat, State Health Society, Health and Family Welfare Department (n.d), *Mamata Abhiyan*; ¹³ Gujarat, Department of Health and Family Welfare (n.d), *Mukhuamantri Amrutum*; ¹⁴ Gujarat, Department of Health and Family Welfare (2012), *Setting up of Gujarat State Nutrition Mission*; ¹⁵ Gujarat CSR Authority (2016); ¹⁶ Mankad (2012); ¹⁷ India, Ministry of Health and Family Welfare (2014), *National Health Mission Annual Report 2013–14*

Note: IMR = Infant Mortality Rate; MMR = Maternal Mortality Rate; ANC = antenatal care; IFA = iron and folic acid; NRHM = National Rural Health Mission; NHM = National Health Mission; JSY = Janani Suraksha Yojana; SAM = severe acute malnutrition; MAM = moderate acute malnutrition; IGMSY = Indira Gandhi Matritva Sahyog Yojana; WIFS: weekly iron and folic acid supplement.

Table 8. Factors which supported changes in nutrition and health programs and policies in Gujarat between 1992 and 2016

| Factors contributing to an enabling environment for scaling up health and nutrition interventions | 1992–2000 | 2000–2006 | 2006–2016 |
|---|---|--|--|
| A vision for impact | -- | <ul style="list-style-type: none"> • Gujarat state health mission launched in 2005 | <ul style="list-style-type: none"> • Gujarat Urban Health Project (2011) • State Nutrition Mission launched (2012) • State strategy for development including goals for each department (2014) • State Urban Health Mission (2015) • Emphasis on functional and geographical convergence between health and ICDS services |
| Interventions | <ul style="list-style-type: none"> • National programs including the National Child Survival and Safe Motherhood program and the Reproductive and Child Health Programme) implemented in the state | <ul style="list-style-type: none"> • Chiranjeevi Yojana launched in 2005 under a public–private partnership (PPP) model to contract private providers for delivery care to the poor in rural areas. • Micronutrient fortification of essential food commodities scaled up to state level | <ul style="list-style-type: none"> • Efforts to strengthen community ownership of ICDS (Aapno Taluko) • State-level innovations to reduce MMR (Mamta Ghar) • Convergence between DWCD and DHFW facilitated through programs such as Mamta Abhiyan and IMNCI • Introduction of programs focused on adolescent girls • Adopted MoHFW guidelines to improve standards of health facilities |

| | | | |
|--|---|--|--|
| Enabling organizational context for intervention scale-up (platforms) | <ul style="list-style-type: none"> • ICDS under the DHFW | <ul style="list-style-type: none"> • ICDS transferred to DWCD • Training cell set up to streamline trainings; resources and infrastructure for training strengthened • Gaining of prominence for gender with the establishment of a Gender Resource Center within the DWCD | <ul style="list-style-type: none"> • NHM and ICDS platforms expanded, convergence improved • DHFW gave prominence to nutrition interventions for SAM and MAM, including micronutrient supplementation and maternal care • Urban health and nutrition infrastructure and services strengthened • UNICEF played a catalytic role in synchronizing ICDS and health boundaries by conducting a pilot program |
| Catalysts, champions, systemwide ownership, and incentives | -- | <ul style="list-style-type: none"> • Academic institutes provided support to government programs, policy development, program implementation, and monitoring efforts • NGO cell established within the DHFW to facilitate engagement between the government and the NGOs • UNICEF and Nutrition International strengthen micronutrient supplementation programs | <ul style="list-style-type: none"> • Government established partnerships with development partners, NGOS, private providers and academia • Nutrition champions in senior positions within the government ensured mainstreaming of nutrition interventions. |
| Contextually relevant strategies and pathways for scaling up | -- | <ul style="list-style-type: none"> • Women's dairy cooperatives became platforms for raising of awareness of maternal and child health interventions and improvement of the economic conditions of families | <ul style="list-style-type: none"> • Scaling up of ICDS and NHM in tandem resulted in expansion and strengthened delivery platforms • Nodal NGOs acted as Regional Resource Centers and provided training and implementation support especially in hard-to-reach areas • Synchronization of ICDS and health boundaries |
| Building operational and strategic capacities | -- | -- | <ul style="list-style-type: none"> • Combined training of ICDS and health workers under the IMNCI program |

| | | | |
|--|---|--|--|
| Adequacy, stability, and flexibility of financing | -- | <ul style="list-style-type: none"> • RCH-II provided additional funds toward the end of the decade | <ul style="list-style-type: none"> • National macro-financing for NRHM, ICDS scale-up; state top-up was possible because of economic growth |
| Adequate governance structures and systems | <ul style="list-style-type: none"> • Frequent change in leadership; brief period of President's rule | <ul style="list-style-type: none"> • Political stability • Frequent bureaucratic transfers • Stability of deputy-level officials at the state level • Stability of officials at the district level | <ul style="list-style-type: none"> • Political stability |
| Mechanisms for monitoring, learning, and accountability | -- | -- | <ul style="list-style-type: none"> • E-monitoring scaled up for programs by DHFW and DWCD • Comprehensive Nutrition Survey in Gujarat (2014) |

Note: ICDS= Integrated Child Development Services; DHFW = Department of Health and Family Welfare; DWCD = Department of Women and Child Development; IMNCI = Integrated Management of Neonatal and Childhood Illnesses; MoHFW = Ministry of Health and Family Welfare.

4.5 Looking Ahead

On December 11, 2020, the fifth round of the National Family Health Survey (NFHS–5) factsheets on 22 Indian states were released, including on Gujarat (IIPS 2020). The data released to date tell a sobering story about child undernutrition. In Gujarat, the change in stunting among children below five was negligible between 2016 and 2019, increasing by 0.5 pp (38.5 to 39 percent). This indicates a stalled progress at the outset, but it requires an in-depth analysis to identify reasons for lack of progress and to identify actions for improvements.

Between 2015 and 2019, there was a decline in all the infant and young child feeding (IYCF) practices except for exclusive breastfeeding. Early initiation of breastfeeding had declined by 24 percent and timely introduction of complementary foods had declined by 14 percent. There was only a marginal change in the proportion of children receiving an adequate diet, and the prevalence rate was unacceptably low at less than 6 percent. Maternal underweight declined by only 2 pp, and overweight among women remained nearly stable changing by only 1 pp (24 percent in 2015 to 23 percent in 2019).

Over the years between 2016 and 2019, major underlying determinants of nutrition also improved. In 2019, 74 percent households used improved sanitation facilities, 22 percent of women 20 to 24 years got married before 18 years, and 34 percent of women 15 to 49 years had 10 or more years of education. Nearly 98 percent households had access to an improved drinking water source in 2019.

Coverage of all health and nutrition interventions, however, improved in Gujarat, with most interventions achieving above 70 percent coverage. Between 2016 and 2019, the proportion of women who had 4 or more ANC visits increased from 70 to 77 percent, and those who received IFA supplements during pregnancy increased from 76 to 89 percent. The proportion of women receiving food supplements increased by 16 pp, from 55 to 71 percent and those receiving health and nutrition education increased remarkably from 47 to 71 percent. Improvements continued in the coverage of facility-based births and births assisted by a health professional. Improvements in coverage of interventions during the postpartum period continued as well. The proportion of women who received postnatal care increased by 28 pp from 63 to 91 percent and those who received food supplements during lactation increased by 21 pp (from 48 to 69 percent). Exposure to health and nutrition education during this life stage increased from 40 to 68 percent. Finally, between 2016 and 2019, there was a 15 pp increase in the proportion of children who received deworming medication (from 30 to 45 percent) and a 13 pp increase in those who received IFA supplements (33 to 46 percent). Coverage of full immunization, which saw a decline between 2006 and 2016 improved by 2019 and reached 76 from 50 percent.

In sum, the NFHS–5 findings available to date suggest that Gujarat's progress on stunting stalled. Coverage of health and nutrition interventions and several underlying determinants improved but a mix of improvements and setbacks were seen for proximal determinants. These trends are concerning, particularly for IYCF practices and lingering challenges related to maternal education. Investments are still needed to improve the equity of coverage and quality of health and nutrition interventions while also continuing to invest in maternal determinants such as age at marriage, education, and health.

Improving coverage, quality and equity of interventions is dependent on the existing health and nutrition platforms and it is an achievable target, particularly given Gujarat's noted improvements

in coverage between 2006 and 2016. Improvements to maternal determinants, however, require separate sectoral investments in education, poverty alleviation, and gender empowerment, as well as societal investments. Lastly, IYCF practices (particularly complementary feeding practices) are still suboptimal; all-out efforts are needed to understand what constraints families face and then to invest in creating environments that enable families to practice optimal IYCF. Notably, since data on household assets is unavailable, as is other data on household consumption, little is known about how households fared economically over the period between NFHS-4 and NFHS-5, and this is an area where additional research will be required.

4.5.1 Interdistrict variability in nutrition and health outcomes in 2019

To support future nutrition actions, we examined the interdistrict variability among the nutrition outcomes and determinants using district-level data from the NFHS–5. These analyses help assess which districts need more attention to solving multiple determinants of undernutrition and also help assess which determinants need attention across all districts. As with the previous analysis, we examine variability across districts in nutrition and health outcomes, in both immediate and underlying determinants, and in the coverage of nutrition programs.

Gujarat carved out seven new districts from 10 existing ones in August 2013 (Table 9), increasing the total number from 27 to 33 districts. These new districts were only accounted for in the fifth round of NFHS survey and hence, the 7 new districts and the 10 old districts are not comparable between 2016 and 2019 without taking into consideration further sampling details.

Table 9. Changes to districts in Gujarat in 2013

| Original districts | New districts |
|------------------------------------|--|
| Sabarkantha | Aravali Sabarkantha |
| Ahmadabad, Bhavnagar | Botad Ahmedabad Bhavnagar |
| Vadodara | Chhota Udaipur Vadodara |
| Jamnagar | Devbhumi Dwarka Jamnagar |
| Junagarh | Gir Somnath Junagarh |
| Panchmahal, Kheda | Mahisagar Kheda Panchmahal |
| Rajkot, Surendranagar and Jamnagar | Morbi Rajkot Surendranagar Jamnagar |

Stunting among children below five years of age varied widely among districts, ranging from 18 percent in Porbandar to 52 percent in Dohad (Figure 8). In 11 districts, 40 percent or more of children below five years were stunted. Among the districts that were comparable, between 2016

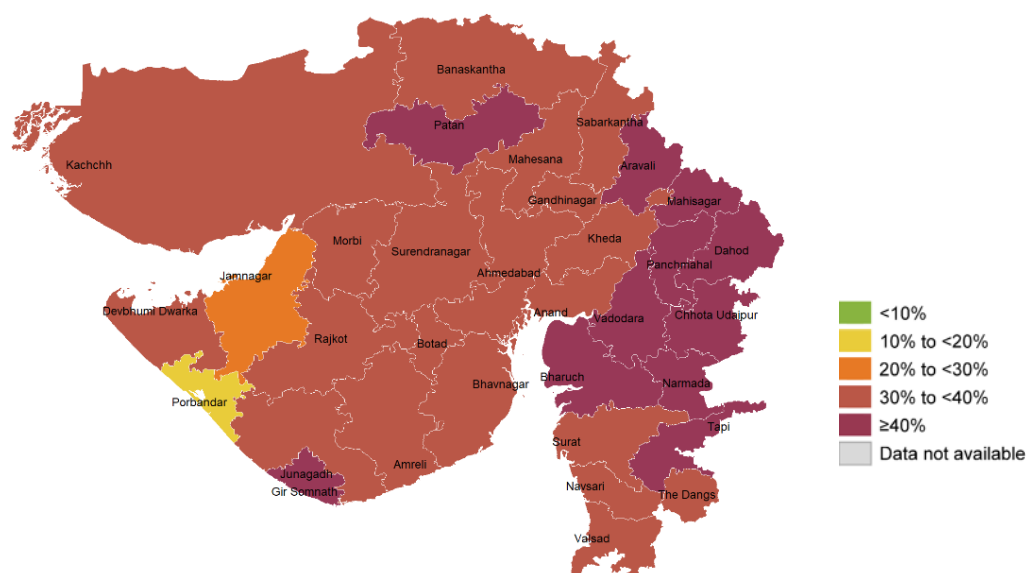
and 2019, stunting increased in Dahod, Gandhinagar, Patan, Surat, and Tapi Districts; the increase was greater than 10 pp in Dahod and Patan. In 2019, Ahmedabad had the highest number of stunted children in the state (Figure 9).

The prevalence of wasting among children was very high across all the districts (greater than 15 percent), with the highest prevalence in The Dangs (41 percent) and the lowest in Junagarh (17 percent) (Figure 10). Among the districts comparable between 2016 and 2019, wasting increased in Anand, Banaskantha, Dahod, Gandhinagar, Mahasena, Navsari, and Tapi Districts. These changes, however, should be interpreted in the context of the differences in the timing of data collection in 2016 (January to June) and 2019 (June to November). The data collection time in 2019 coincides with the monsoon season, which has implications for child morbidity and wasting. The increase in wasting prevalence in these districts is likely due to seasonal effects and needs further investigation.

The prevalence of underweight was alarmingly high in the state, at 30 percent or higher in most districts; the highest prevalence of underweight was in The Dangs (53 percent) (Figure 12). Among the districts that were comparable, between 2016 and 2019, underweight increased in Anand, Banaskantha, Bharuch, Dahod, Gandhinagar, Navsari, Patan and Tapi Districts. In 2019, Surat had the highest number of underweight children in the state (Figure 13).

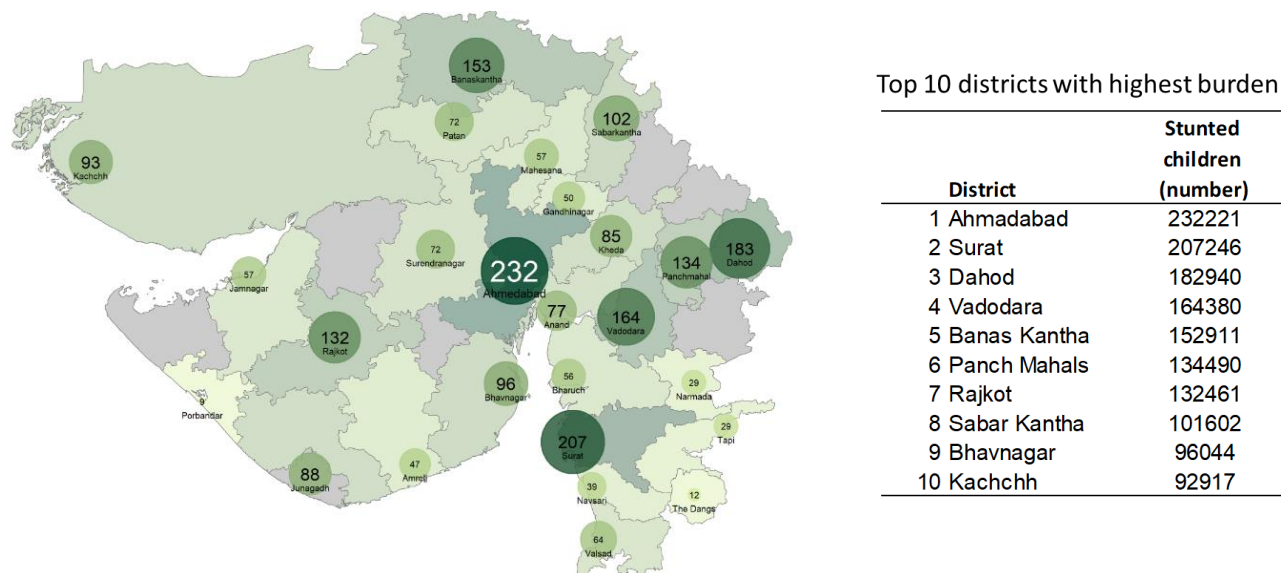
All three anthropometric outcomes increased in Dahod, Gandhinagar, and Tapi Districts. Ahmedabad, Dahod, and Surat Districts are also among the top ten districts with the highest burden of stunted, wasted, and underweight children. This is indicative that the eastern region of the state needs particular attention.

Figure 8. Stunting among children under five years of age in districts across Gujarat, 2019



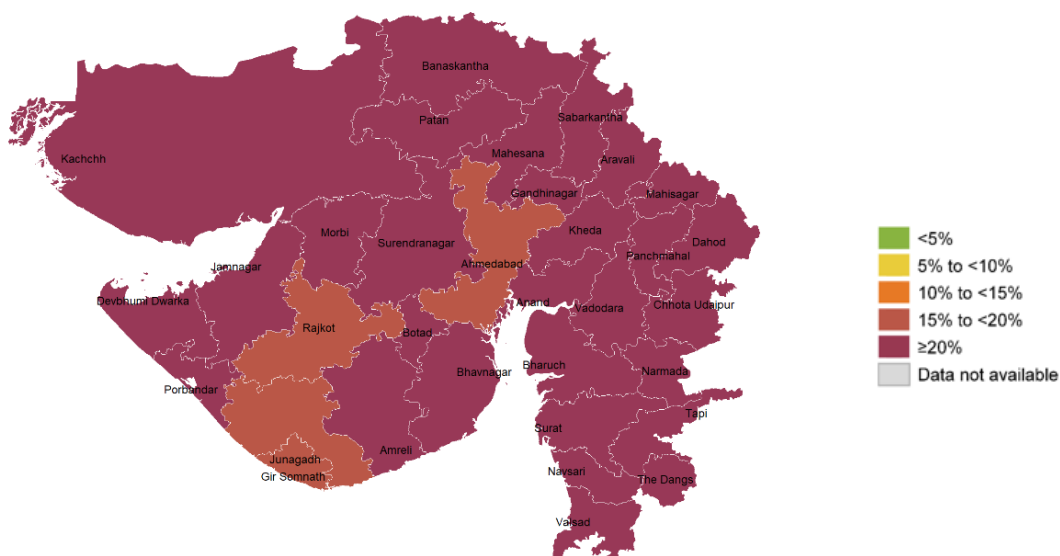
Source: National Family Health Survey–5 (2019/2020), IIPS (2020).

Figure 9. Number of stunted children under five years of age in Gujarat, 2019



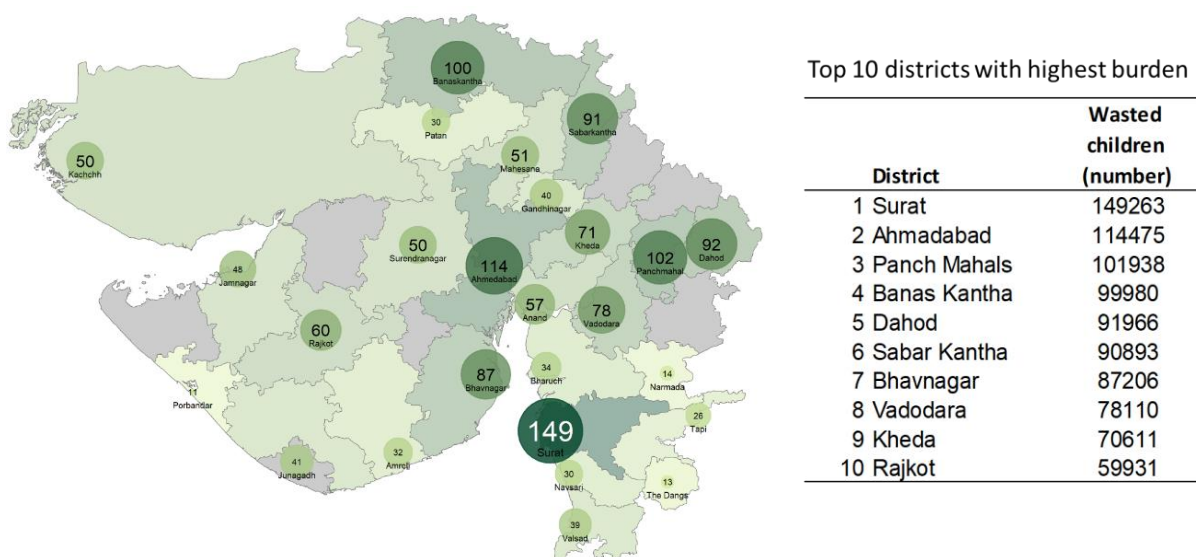
Source: International Food Policy Research Institute estimates. The headcount was calculated as the product of the undernutrition prevalence and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS 5 (2019/2020) and projected population for 2019 was estimated using Census 2011. **Note:** The unit of the numbers in the graph above is thousands

Figure 10. Wasting among children under five years of age in districts across Gujarat, 2019



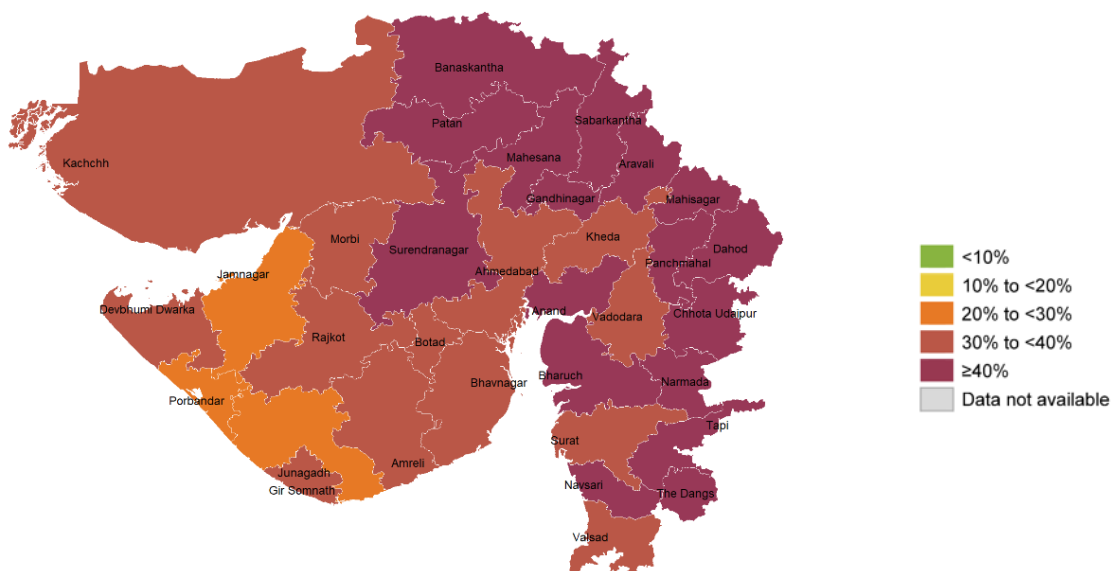
Source: National Family Health Survey–5 (2019/2020), IIPS (2020).

Figure 11. Number of wasted children under five years of age in Gujarat, 2019

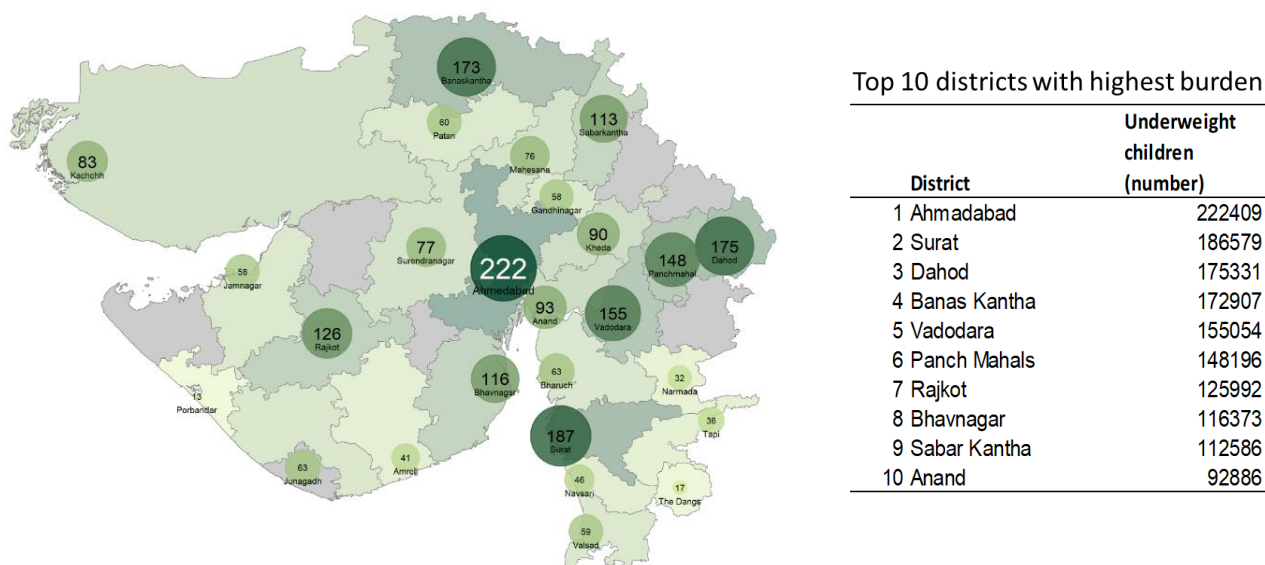


Source: International Food Policy Research Institute estimates. The headcount was calculated as the product of the undernutrition prevalence and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS 5 (2019/2020) and projected population for 2019 was estimated using Census 2011. **Note:** The unit of the numbers in the graph above is thousands

Figure 12. Underweight among children under five years of age in districts across Gujarat, 2019



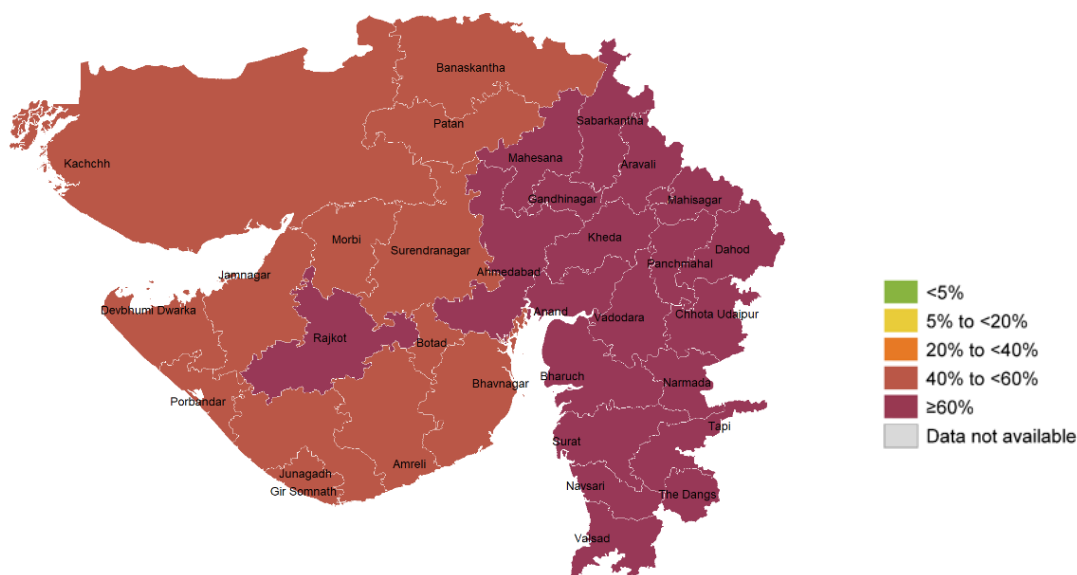
Source: National Family Health Survey–5 (2019/2020), IIPS (2020).

Figure 13. Number of underweight children under five years of age in Gujarat, 2019

Source: International Food Policy Research Institute estimates. The headcount was calculated as the product of the undernutrition prevalence and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS 5 (2019/2020) and projected population for 2019 was estimated using Census 2011. **Note:** The unit of the numbers in the graph above is thousands

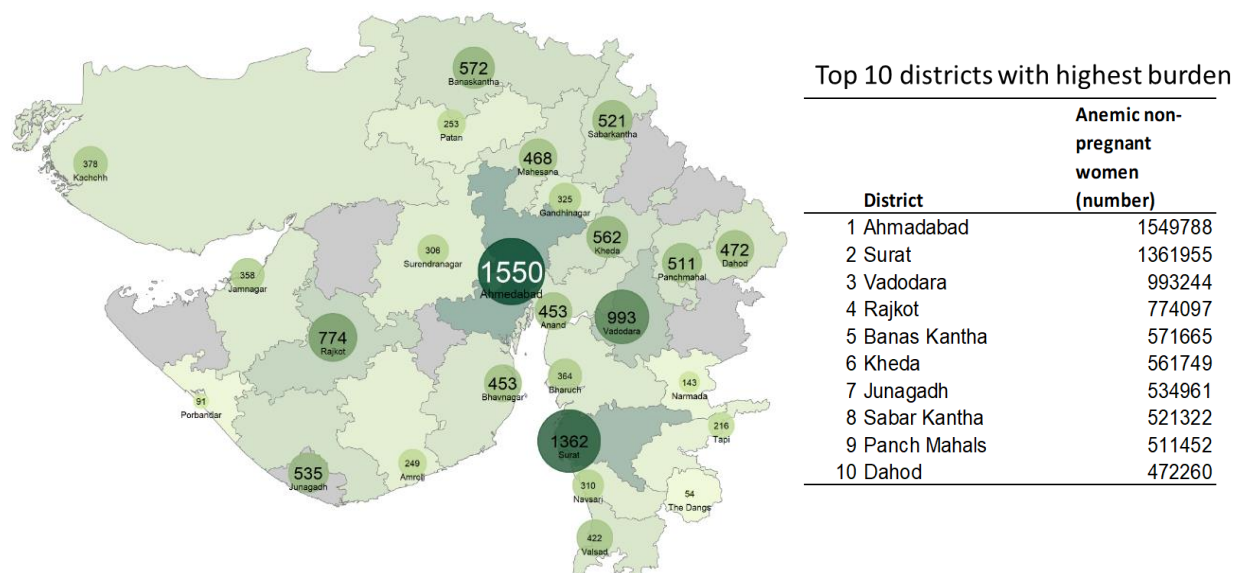
Prevalence of anemia across the life stages had increased in the state. Anemia among non-pregnant (Figure 14) and pregnant women (Figure 16) was particularly high among the districts in the eastern region. Among children 6 to 59 months, prevalence of anemia was alarmingly high across the state (Figure 18); more than 60 percent of children were anemic in all districts. In Aravali, Narmada, and Panchmahal, more than 90 percent children were anemic. Ahmedabad and Surat have the highest burden of anemia across all three groups. These high prevalence rates of anemia are a huge public health concern and require an urgent and deeper investigation of causes and potential solutions.

Figure 14. Anemia among non-pregnant women in districts across Gujarat, 2019



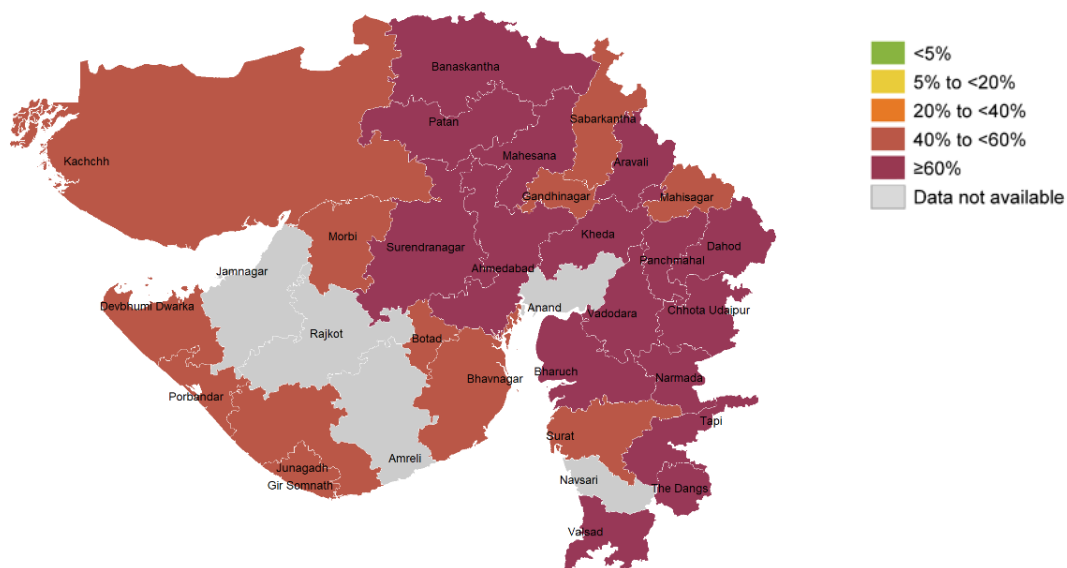
Source: National Family Health Survey–5 (2019/2020), IIPS (2020).

Figure 15. Number of non-pregnant women with anemia in Gujarat, 2019



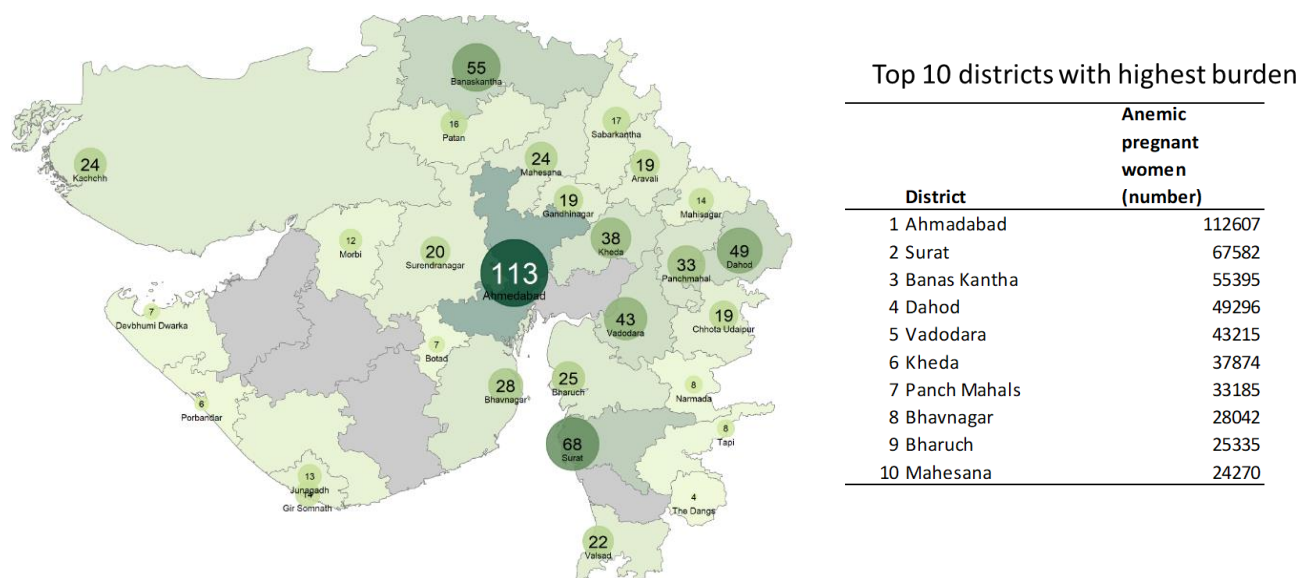
Source: International Food Policy Research Institute estimates. The headcount was calculated as the product of the undernutrition prevalence and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS 5 (2019/2020) and projected population for 2019 was estimated using Census 2011. Note: The unit of the numbers in the graph above is thousands

Figure 16. Anemia among pregnant women in districts across Gujarat, 2019



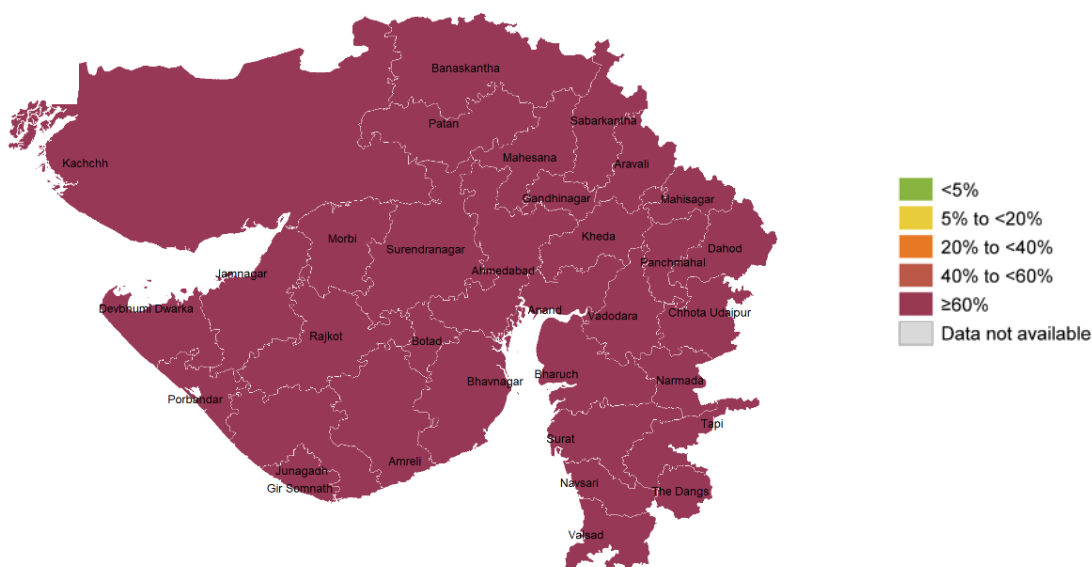
Source: National Family Health Survey–5 (2019/2020), IIPS (2020).

Figure 17. Number of pregnant women with anemia in Gujarat, 2019



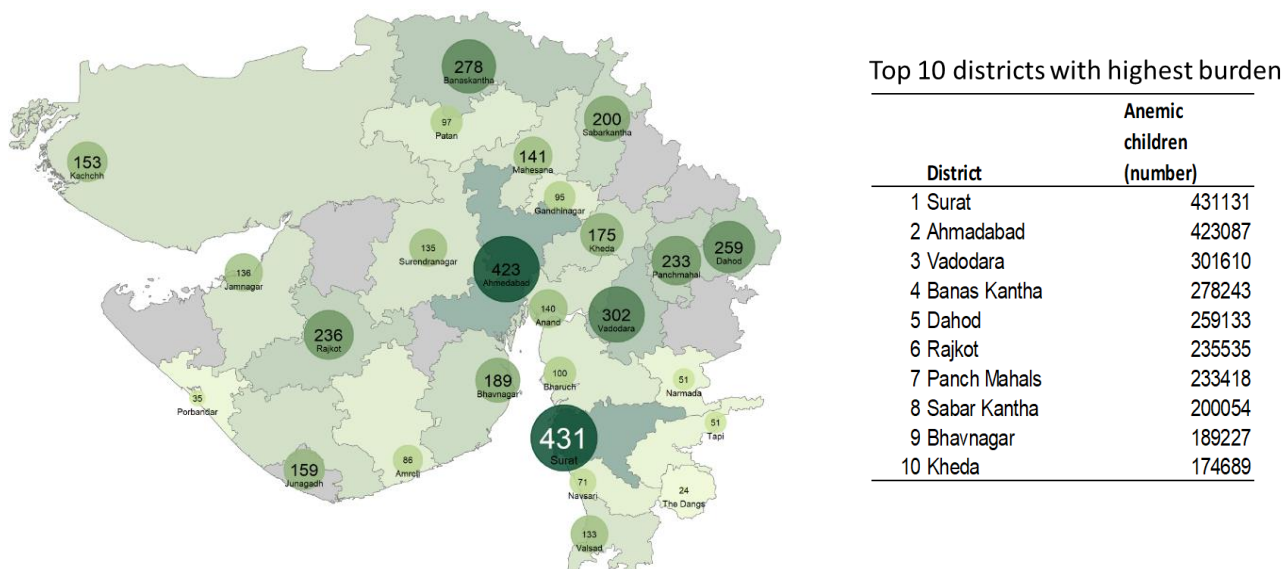
Source: International Food Policy Research Institute estimates. The headcount was calculated as the product of the undernutrition prevalence and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS 5 (2019/2020) and projected population for 2019 was estimated using Census 2011. **Note:** The unit of the numbers in the graph above is thousands.

Figure 18. Anemia among children under five years of age in districts across Gujarat, 2019



Source: National Family Health Survey–5 (2019/2020), IIPS (2020).

Figure 19. Number of children under five years of age with anemia in Gujarat, 2019



Source: International Food Policy Research Institute estimates. The headcount was calculated as the product of the undernutrition prevalence and the total eligible projected population for each district in 2019. Prevalence estimates were obtained from NFHS 5 (2019/2020) and projected population for 2019 was estimated using Census 2011. **Note:** The unit of the numbers in the graph above is thousands.

4.5.2 Interdistrict variability in the immediate determinants of nutrition in 2019

The proportion of women with low BMI was variable across districts and ranged between 16 percent in Porbandar and 39 percent in Dohad. Among child-feeding practices, there was a high interdistrict variability in the early initiation of breastfeeding (EIBF), ranging from 17 to 56 percent. In Devbhumi Dwarka and Porbandar, the prevalence of EIBF was higher than 50 percent. Exclusive breastfeeding (EBF) varied among districts, ranging from 36 to 88 percent. Of the 33 districts, EBF prevalence rates could be calculated only for 21 districts, as in the remaining districts, fewer than 25 children were measured. In ten of these districts, EBF was higher than 50 percent. Appropriate complementary feeding practices was very low in all districts, ranging from 0 to 16 percent. In Mahesena and Navsari none of the children received an adequate diet. On a positive note, among the districts comparable, between 2016 and 2019, there was a 14 pp increase in the proportion of children receiving adequate diet in Porbandar (14.5 percent) and The Dangs (16.5 percent) Districts.

Morbidity among children was low in Gujarat. The proportion of children with diarrhea in the 2 weeks preceding the survey ranged from 2 to 17 percent. In 19 of the 33 districts, the prevalence of diarrhea was lower than 10 percent. The proportion of children with symptoms of acute respiratory infection (ARI) in the 2 weeks preceding the survey ranged from 0 to 3.9 percent; only in 5 districts was the prevalence of ARI more than 2 percent. Among the districts comparable between 2016 and 2019, there was an increase in the prevalence of diarrhea in Gandhinagar (12 pp) and Mahesena (9 pp) and prevalence of ARI in Dahod (1 pp), Navsari (3 pp), and The Dangs (2 pp). The data collection time in 2019 coincides with the monsoon season, which has implications for diarrhea and therefore requires further scrutiny.

4.5.3 Interdistrict variability in underlying determinants of nutrition in 2019

Across districts in Gujarat, there was variability in women's age at marriage and education status. The proportion of 20 to 24 years women who were married before 18 years was between 7 to 49 percent. In 8 districts, more than 30 percent of women were married before 18 years. The proportion of 15 to 49 years women who had more than 10 years of schooling was between 18 and 48 percent. In 19 of the 33 districts, less than a third of women had attained 10 or more years of education. In Banaskantha, Kheda, Panchmahal, Patan, and The Dangs Districts, more than 30 percent were married before 18 and less than 30 percent of women had received more than 10 years of education. Among the districts comparable between 2016 and 2019, in 3 districts (Narmada, Dohad, Amreli) there was a decline of approximately 1 to 7 pp in the proportion of women attaining 10 years of education; in Gandhinagar District, however, there was a 11 pp increase. Both women's age at marriage and education need immediate attention. It is plausible that ensuring higher education for women could help delay marriage until women are over 18 years.

Across all districts, more than 90 percent of households had improved drinking water source. The proportion of households using improved sanitation facilities varied among the districts, ranging from 36 percent in The Dangs to 87 percent in Ahmedabad.

In 26 of the 33 districts, more than 60 percent of households reported using improved sanitation facilities. Among the districts comparable between 2016 and 2019, 9 districts had remarkable improvements in sanitation. In The Dangs, households using improved sanitation improved from 19 to 72 percent and in Tapi, it increased from 39 to 70 percent. In Gujarat, in nearly all districts, more than 90 percent of households have access to electricity.

4.5.4 Interdistrict variability in coverage of nutrition-specific interventions in 2019

As in 2016, the coverage of nutrition-specific interventions varied by district in 2019. The coverage of antenatal care (four or more ANC visits) ranged from 56 to 95 percent; in most districts, the coverage was higher than 70 percent and in 8 districts it was 90 percent or higher. Remarkable improvements were observed in the coverage among some of the districts comparable between 2016 and 2019; there was 52 pp increase in coverage in Amreli. In some other districts, however, substantial declines were noted. This mixed coverage requires further investigation to unpack the reasons for decline and address them immediately. The coverage of protection against neonatal tetanus was high across districts and ranged between 73 and 98 percent.

The coverage of deliveries in health facilities and births assisted by a health professional was high and there was limited interdistrict variability. The proportion of mothers receiving postnatal care within two days after delivery ranged between 78 to 98 percent. A health check-up for children in the first two days after birth was high as well across the districts and ranged between 73 and 99 percent.

Coverage of full immunization varied across the state, ranging from as low as 43 percent in Banaskantha to as high as 97 percent in Tapi. In 21 districts, more than 75 percent of children were fully immunized. The coverage of vitamin A supplementation was high, ranging from 75 percent in Banaskantha to 97 percent in Porbandar. In 26 of the 33 districts, more than 80 percent children among 9 to 35 months had received vitamin A supplementation in the previous six months. Navsari, Surat, and Valsad had more than 90 percent coverage of both full immunization and vitamin A supplementation.

Overall, the coverage of nutrition-specific interventions is high. The trajectory of improvement of interventions needs to continue and deeper analysis to identify reasons for decline in coverage of some interventions in some districts is much needed.

5. CONCLUSIONS AND RECOMMENDATIONS

Gujarat, a state in western India with a population of 60 million, is one of the country's high-income states. Between 2006 and 2016, it has shown one of largest declines in stunting, both in absolute terms and compared to the national average. Our analysis indicates that improvements in health and nutrition services, SES, maternal BMI and maternal education, hygiene, village sanitation and electricity and access to health insurance contributed to actual changes in stunting among children 6 to 59 months of age. These changes could be achieved with a vision, intent, financing, and building capabilities. Finally, developments that supported the improvements in nutrition were enabled by a stable political environment, capable leadership at the departmental levels and stable district-level leadership.

Gujarat witnessed a stalling of progress in stunting prevalence between 2016 and 2019. A mixed picture emerged on trends in IYCF practices. Improvements in household conditions continued, particularly in sanitation. The scope for improvements in women-level factors including age at marriage and education remains. On a promising note, coverage of health and interventions improved, suggesting that administrative capabilities, systems strengthening and a general commitment to improve direct nutrition programs remained stable.

To continue its progress on stunting, the state must focus on improving coverage of all health and nutrition interventions along with quality and equity and it must continue to improve maternal determinants such as age at marriage, education, and health. The IYCF practices, particularly complementary feeding practices, are also suboptimal and need immediate attention.

Recommendations

In an era of commitment by India to global nutrition targets, it is an opportune time for Gujarat to accelerate actions necessary to meeting its nutrition targets. The huge gaps in IYCF practices, women's education (especially girls' education at the secondary level) and early marriage need to be urgently prioritized. Gaps in the coverage of interventions also need to be addressed; these include ANC during pregnancy and childhood immunization.

Finally, the substantial interdistrict variability across most determinants and interventions highlight the importance of taking a strong district-specific focus. Across the state, there are contextual differences between the districts, including topography, type of population, and infrastructure. This kind of variability calls for investments in deepening the understanding of district-level factors and identifying strategies to bridge gaps in the multiple determinants of undernutrition. Additional analytic work is necessary in each district to further understand the contextual factors and to develop tailored strategies for addressing the various determinants that can in turn deliver improvements in nutrition.

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