

Acknowledgement

Between March 2020 and January 2022, India has seen three waves of Covid. The first wave, when little was known about the virus, the country saw a prolonged lockdown, to control the spread of the disease and to gear up the medical response. The lockdown led to disruption in public services, supply chains and loss of employment. The Government extended the social security measures in form of Pradhan Mantri Garib Kalyan Yojana, MNREGA, direct cash transfers in Jan Dhan accounts for the vulnerable population and Atma Nirbhar Bharat package to meet the crisis. The Economic Survey Report 2022 shows that the social safety measures provided succor to the vulnerable population.

The second wave presented the highest case fatality rates. During this wave, the country did not go into complete lockdown employing decentralized measures to contain the virus. In January 2021, the country launched one of the largest global vaccination drives, and as on July 2022, the cumulative COVID vaccination coverage had exceeded 200 Crore.

The third wave starting in December 2021 had a rapid spread across India, but the severity of illness and mortality rates were lower than previous waves. The disruptions were lesser during the third wave, and the country is on path for economic recovery. Different studies carried out during the pandemic period show disproportionate impact on vulnerable population groups.

These different waves affected families' access to health, food security, livelihood and nutrition services as well as families' livelihoods in different ways.

This report is the result of a large group of development partners working on food and nutrition related issues, sharing information, data, knowledge related to COVID, Food and Nutrition. Public Health Foundation of India has reviewed all this and other publicly available data covering the period from March 2020 to April 2022 and drafted the report which serves to give access to data and analysis of data on how COVID affected the delivery of key services, and nutritional status of children and adults in India and measures that were put in place to mitigate the severity of the impact.

The report has further analyzed the gaps in information and makes recommendations for future response to emergencies that could affect food and nutrition security.

We would like to thank all the organizations that contributed data, publications, and other information sources for this synthesis and assisted with the review and update of drafts. We also would like to thank the team of Public Health Foundation of India for reviewing and analyzing all the data and information and drafting the report. Also, thanks to the UNICEF colleagues that facilitated the process at the various stages.

Where large amounts of different quality data and information is compiled, errors are possible. If you find any errors or when you have additional data / information, please let us know so we could improve in a possible future version. You can reach us through writing to poshan@unicef.org.

We wish you happy reading and much inspiration!

Kind Regards,
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Chief, Nutrition Programme, UNICEF India.

Abbreviations

AAY	Antyodaya Anna Yojana
ASHA	Accredited Social Health Activist
AMB	Anaemia Mukht Bharat
AWC	Anganwadi Centre
AWW	Anganwadi Worker
ANC	Ante-natal care
ANM	Auxiliary Nurse-Midwife
BE	Budget estimates
BPL	Below Poverty Line
CAS	Common Application Software
CMAM	Community based management of acute malnutrition
CMIE	Centre for Monitoring Indian Economy
FLW	Frontline workers
FY	Financial year
HBYC	Home Based Care for Young Child
HH:	Household
HMIS	Health Management Information System
HRP	High risk pregnancy
IFA	Iron and Folic Acid
ICDS	Integrated Child Development Services
MAA	Mother's Absolute Affection
MAM	Moderate Acute Malnutrition
MDD	Minimum Dietary Diversity
MDM	Mid-Day Meal
MNREGA	Mahatma Gandhi Rural Employment Guarantee Act
MoWCD	Ministry of Women and Child Development
NFHS	National Family and Health Survey
NFSA	National Food Security Act
NGO:	Non-Governmental Organization
NR	Not reviewed
NRC	Nutrition Rehabilitation Centre
ONORC	One Nation One Ration Card
PMGKAY	Pradhan Mantri Garib Kalyan Anna Yojana
PM POSHAN	Pradhan Mantri Poshan Shakti Nirman
PPE	Personal Protective Equipment
POSHAN	Prime Minister's Overarching Scheme for Holistic Nutrition
PDS	Public Distribution System
RE	Revised estimates
RMNCH+A	Reproductive, Maternal, Newborn Child plus Adolescent Health
SAM	Severe Acute Malnutrition
SBCC	Social and Behaviour Change Communication
SHG	Self-Help Group
SNP	Supplementary Nutrition Program

THR	Take Home Ration
TPDS	Targeted Public Distribution System
UT	Union Territory
VAS	Vitamin A supplementation
VHSND	Village Health Sanitation and Nutrition Day
WASH	Water, Sanitation and Hygiene

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Executive summary

The COVID-19 pandemic along with its devastating waves have heightened the risk of nutritional vulnerabilities in India through disruption in services, loss of livelihood, increasing food prices and repeated episodes of economic distresses during the pandemic ([Headey et al., 2020](#), [FAO 2020](#)). The pre-existing burden of malnutrition in the country includes the coexistence of a large number of undernourished children and women, high levels of micronutrient deficiencies alongside rising prevalence of overweight, obesity and diet related non-communicable diseases ([NFHS 4, 2015-16](#)). To effectively recognize and address the threats of COVID-19, it is essential to systematically monitor the short- and long-term impacts of the pandemic on nutritional status among Indian population.

The recently released National Family Health Survey-5 (NFHS 5, 2019-21) provides the latest population level data on health and nutrition indicators. However, it does not reflect the impact of the COVID-19 as the majority of data was collected prior to the pandemic ([NFHS 5, 2019-21](#)). So, this report assesses the impact of the COVID-19 pandemic on nutritional status, food accessibility and continuity of essential food and nutrition services in India through a review of different reports and publications covering the period of March 2020 to April 2022.

Each document used in the current report was assessed on a set of 6 to 16 question (based on study design), to identify any risk of bias in the scientific document. Major criteria for assessing the strength of evidence for primary quantitative studies include quality and clarity of research question, sampling strategy, sample size justification, data analysis, quality and type of variable captured along with discussion and results. Some criteria for quality assessment of review articles included importance and quality of research question, search strategy and study inclusion criteria, presence of evidence-based statements along with discussion and references. Similar criteria were modified and used for other study designs as well. Based on these questions developed for different study design, each document was assessed subjectively, and the documents were categorized as “high” (★ ★ ★), “medium” (★ ★) or “low” (★) strength of evidence. However, in case of data dashboards, these were not assessed for strength of evidence and was denoted with “NR” (Not Reviewed) (further details on this is provided in Methodology section [1.3](#)). The report has analysed the findings in published and grey literature that collected data on how COVID-19 affected nutrition in India.

Analysis of Centre for Monitoring Indian Economy (CMIE) data and other studies conducted during the pandemic period (described in Section [4.2.1](#)) reveal large scale job loss and economic hardship caused to people, with daily wage workers, migrant labourers, women workers and small farmers more adversely affected. There were disruptions in the agricultural sector as well with a number of studies (described in Section [4.1](#)) reporting supply chain issues, non-availability of markets, sharp decline in prices of non-cereal agricultural produces due to non-availability of markets, in turn causing loss of income and economic hardships particularly for women and small farmers. Food security became a major challenge, with many studies (described in Section [4.2](#)) reporting reduction in consumption of food due to economic hardships, again, this was more pronounced among economically weaker sections of the society. Government initiated various measures to mitigate the crisis through allocation of additional food rations under Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) for families covered under National Food Security Act, increased allocation for Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) and direct cash transfer to bank accounts of women under Jan Dhan Yojana. However, while these measures provided succour to a large section of the population, yet accessibility was reported to be a challenge by many vulnerable communities like migrant labourers, nomadic and denotified

tribes, or by households left out from NFSA safety net due to exclusion or implementation errors (described in Section [3.2.4](#)). Many studies (described in Section [2.2](#)) have shown changes in food consumption pattern with lower consumption of fruits, vegetables and animal proteins, particularly during the initial phase of the pandemic due to non-availability, non-affordability and misconceptions related to consumption of animal origin foods. Dietary diversity took a backseat particularly during the initial phases of the pandemic (described in Section [3.1.2](#)). On the other hand, there was also a growing consciousness for consuming nutritious, home-made and “immunity-boosting” food due to the different awareness campaigns from Government and non-Government agencies, including by civil society organizations, media and social media.

Since the lockdown announced in March 2020 during the first wave of COVID-19, most frontline functionaries and health facilities were repurposed for COVID tracing and treatment. This along with the closure of schools and Anganwadi Centres led to disruption in routine health and nutrition services. However, The Government issued various guidelines for restoration and continuity of these services in containment (red), buffer (orange) and areas beyond containment and buffer (green) zones (described in Section [3.2](#)).

While the Anganwadis remained closed for most of the pandemic period, services such as distribution of supplementary nutrition, micronutrient supplementation (IFA and vitamin A supplementation), counselling on infant and young child feeding (IYCF), growth monitoring took place through home visits by Anganwadi workers and door-to-door distribution of supplementary nutrition. The Nutrition Rehabilitation Centres (NRCs) for treatment of children with severe acute malnutrition (SAM) were also operational in most states, albeit there were difficulties in reaching these facilities due to restricted mobility during lockdown period. The immunization services for children continued with observation of appropriate COVID protocol. However, there is paucity of data in public platform on the exact coverage of these services. Section [3.2.1](#) describes in detail how the continuity of services for pre-school children was affected during the pandemic period.

The closure of schools led to disruption of school-based nutrition interventions, such as Iron Folic Acid Supplementation, or mid-day meals. As an alternative, IFA was distributed by ASHAs and Anganwadi workers during home visits (described in Section [3.2.1](#)). Available data on IFA supplementation for adolescents in Anaemia Mukh Bharat dashboard shows drastic decline in coverage during the pandemic period. The school mid-day-meal programme (now called PM Poshan) also came to a halt, and later restored. Different State Governments adopted different means- providing dry rations, or cash payments in lieu of food or a combination of both, in place of hot cooked food served through school mid-day-meal programmes (detailed description in [3.2.2](#)). Here again, there is paucity of coverage data in public domain.

For pregnant and lactating women, the essential maternal health and nutrition services continued during the pandemic period through home visits, door to door distribution of dry rations (described in Section [3.2.3](#)). While the coverage data on supplementary nutrition is not available on public domain, data available on Anaemia Mukh Bharat dashboard shows a slight drop in ANC services during the pandemic period. At the national level, pregnant women registered for ANC was about 95.0% in June 2019, which reduced to 87.2% in June 2020 and further reduced to 85.3% in June 2021. Pregnant women receiving 4 or more ANC reduced from 71.0% in June 2019 to 68.5% in June 2020, however subsequent data for June 2021 is not available. Compared to June 2019, an increase in coverage of IFA, calcium and deworming was reported in Anemia Mukh Bharat data in June 2021 (Section [3.2.3](#)) Pradhan Mantri Matru Vandana Yojana (PMMVY) was also operational during the pandemic period (Section [4.3.1](#)), however, there is paucity of data in public platform on its coverage.

Very little information is available of the impact of COVID pandemic on the anthropometric status of children or adults. A few small studies during this period (described in Section [2.1](#)) show varied results; while some studies report loss of weight among adults, others have reported to increased BMI. However, these studies are limited by small sample size and cannot be generalized.

Handwashing with soap became important for prevention of COVID infection, as much as it is important preventive measure against other gastro-intestinal infections and subsequent malnutrition. Government and different organisations took initiatives for promotion of WASH practices (described in Section [4.3.2](#)), however a few studies have shown water stress as an inhibiting factor against handwashing practices. It was also a challenge to integrate WASH practices with other interventions being led by different Ministries. [Jal Jeevan Mission](#) launched by Government of India should be a positive step in this direction to alleviate inaccessibility to water.

During initial phase of the lockdown, AWC were not functional, Village Health, Sanitation and Nutrition Days (VHSND), counselling and community events were not conducted. Initiatives were undertaken to utilize the digital platforms for sharing information in the absence of community events. Government of Maharashtra launched [Tarang Suposhit \(Tarang Suposhit Maharashtra, n.d.\)](#), a digital platform equipped with facilities like a helpline number, a broadcast call and a WhatsApp chatbot. Similarly, Government of Odisha used [Tiki Mausi](#) for generating awareness on COVID appropriate behaviour and nutrition. A remote sensitisation and supportive supervision mechanism was established by the Department of Social Welfare, Government of Assam. Similarly, tracking of nutritional status of pregnant and lactating women along with malnourished children via [RapidPro](#), in Odisha amidst the double burden of cyclone and COVID pandemic was noteworthy. Government of Gujarat similarly used multiple digital platforms and [Umbare Anganwadi](#) digital platform to reach out to field level functionaries and last mile stakeholders by virtually celebrating community-based events during COVID-19 lockdown and after ([UNICEF Innovations and Adaptations](#)). These initiatives have been described in Section [4.3.3](#).

Women were disproportionately affected by the pandemic. Various studies (described in Section [5.3](#)) have reported disproportionate loss of livelihood and income by women, increased workload, lower pay and increase in unpaid work during the pandemic. Higher school dropout rates and rise in early marriage were reported by some studies. There were reports of social isolation and increased abuse and domestic violence against women during this period.

While there was an increased threat of worsening nutritional status in the population during the pandemic, finances were allocated to meet additional requirements for managing COVID. The workforce was repurposed for COVID management (described in Section [5.2.2](#)). There was stagnation in budgetary allocation for nutrition (described in Section [5.2.1](#)). The Government re-consolidated existing nutrition programmes under Poshan 2 and Saksham Anganwadi programme, the [guidelines](#) of which were recently released (in August 2022). The Government also launched 3 new schemes: One Nation One Ration Card (ONORC) to help households particularly migrant workers to access food rations under Public Distribution Scheme (PDS) anywhere in the country, Rice Fortification Pilot Project for distribution of fortified rice in one district each of 15 States and National Millet Mission for incorporating use of millets under NFSA (details in Section [5.1.1](#))

Though there is some data available to understand the impact of pandemic on different aspects of nutrition in India, these evidences are generated from many small studies conducted on different sets of population across

India. There is but imitation to the extent of generalising this data on the entire population and throughout the duration of pandemic. The available data highlight the reduced diet diversity and food security, which was especially pronounced among the socially and economically vulnerable. Due to lack of robust system for data monitoring and plan for managing health emergencies, the continuity of health and nutrition programs were affected especially during the first lockdown. These services were later modified and recovered in the subsequent unlocking phases. So, based on this report we can conclude that the impact of pandemic on nutrition in India has been multi-faceted. Taking lessons from the pandemic, following recommendations may be useful for developing a more resilient health, food security and nutrition service delivery systems for future emergencies.

1. The pandemic called for quick decision making with inter-departmental coordination, so the need to sustain leadership for food and nutrition security within the Prime Ministerial and Chief Ministerial Offices and District Magistrates and Panchayats to ensure coordination, monitoring and adequate financing of nutrition specific and nutrition sensitive interventions.
 - a) High powered leadership to look into any signs of worsening nutrition situation post pandemic through regular review of administrative data.
 - b) Enhance multisectoral interventions, with focus on ensuring food security, coverage and continuity of essential health and nutrition services.
 - c) Ensure prioritization and adequate financing for nutrition in post-Covid scenario, with aim to increase outreach among vulnerable communities.

2. Since the paucity of data to completely understand the pandemic was a major concern, strengthening the data systems available in the country to quickly (real-time) and effectively (quality) capture changes of nutritional status amidst any new possible disaster or crisis to be prioritised.
 - a) Improving the quality and routine update of regular administrative data along with focus on national nutrition surveys (season specific data collection) for better policy and program decisions.
 - b) Real-time nutrition data collection and setting up of a nutrition surveillance system.
 - c) Monitoring and data driven decision making using various national level data trackers like HMIS, Poshan Tracker.
 - d) Integration of data collected under different departments to reduce duplication.
 - e) Regular data reviews to study the trends in coverage, continuity, and quality of interventions. This would help in identifying areas requiring corrective actions with respect to quality of services and tracking their last mile delivery.

3. As the pandemic caused some disruption in services, there is a need to facilitate and support uninterrupted, universal, timely and high-quality implementation and coverage of all essential nutrition specific services (affected due to pandemic) in all parts of the country.
 - a) Ensuring continuity and coverage of the nutrition services at the anganwadi centres, schools, nutrition rehabilitation centres, and optimally operationalizing village health sanitation and nutrition days (VHSND).
 - b) Ensuring timely distribution, improving the quality of supplementary nutrition programs as well as take-home rations.
 - c) Universal coverage of essential micronutrient supplementation programmes- IFA supplementation, calcium supplementation, deworming and biannual vitamin A supplementation program.

- d) Setting up and/or strengthening of effective logistic management information system for continuity of all nutrition services.
 - e) Due considerations to be given to reaching out to the most vulnerable (women, children and socio-economically impoverished population) and last mile delivery of these services.
4. To ensure recovery from the disruptions caused due to the pandemic, it is imperative to accelerate efforts to address food security, including dietary diversity and access to adequate micronutrients, primary health care, safe drinking water, environmental, household sanitation and address gender issues pertaining to women's education and delaying age of conception.
- a) Promoting the use of diverse, indigenous, nutrient rich foods in the supplementary feeding programs
 - b) Counselling and promotion of alternative recipes and nutrient dense local food items to meet the nutritional requirement during emergencies.
 - c) Promoting home and institution-based (school and anganwadi centre) kitchen gardens to promote dietary diversity.
 - d) Actively incorporating coarse cereals and pulses along with wheat and rice in TDPS to encourage dietary diversity and enhance nutritional quality of foods distributed under food safety nets.
 - e) Due consideration to be given to gender sensitivity and equitable distribution and outreach of these interventions.
 - f) Exclusion errors in NFSA to be addressed to cover the vulnerable population especially during crisis situations.
5. To strengthen multisectoral approach and effective delivery of interventions under health, WASH, livelihood, agriculture, other social sectors along with their integration with mainstream nutrition programs amidst the COVID-19 pandemic.
- a) Aid in creating a supportive environment by devising policies for controlling the food prices in such emergencies, the shorter supply chain for local produce and farmers' cooperatives for promoting production and consumption of local produce.
 - b) Role and importance of Krishi Vigyan Kendra (KVK) in ensuring supply and support for agricultural inputs has been reiterated in the pandemic. Lessons from these may be useful to strengthen farmer support organization at sub-district level to adapt to a similar situation of crisis.
 - c) "Direct sale of produce to the consumer" model adapted in the pandemic may be promoted and supported in case of other emergencies.
 - d) To ensure social safety nets and financial empowerment among the community, effective delivery of programs for livelihood generation or employment guarantee schemes like MGNREGA need to be strengthened and universalized to include migrant workers.
 - e) The gender aspect of these programs needs special attention, so does the outreach of these livelihood generation schemes to the vulnerable strata of the population.
 - f) Close coordination between different sectors to be ensured through high level leadership.
6. The need for community participation and engagement in addressing the factors contributing to health and nutritional concerns has been highlighted in the pandemic.
- a) Risk Communication and Community Engagement (RCCE) to promote uptake of antenatal, postnatal, and early-childhood nutrition services and practices by pregnant and postpartum women and caregivers of children under two years (e.g., maternal micronutrient supplementation, dietary diversity,

breastfeeding, and overall maternal infant and young child nutrition (MIYCN) practices) during pandemic and emergencies.

- b) Special emphasis on BCC strategy for optimal food handling practices, WASH practices and issues of social and gender inequality will ensure holistic recovery from increased burden of malnutrition and COVID-19.
- c) Creating awareness among population to ensure uptake of catch-up immunization sessions may help in recovering from the missed doses of vaccines.

7. **Devising strategies for adapting to COVID-19 guidelines and innovations in the service delivery mechanism.**

- a) Developing innovative methods and protocols for disaster preparedness so that human resources can be better utilized during the times of crisis. For example, use of telecommunication for real time data entry for monitoring purposes and interpersonal counselling.
- b) Skill-building of the front-line workers on efficient interpersonal communication to address nutrition concerns across different population groups.
- c) Incentivising and protection of the human resources to quickly adapt to health and nutrition emergencies.
- d) Improving health infrastructure to cater to the growing needs to the population in case of health emergencies (e.g., PPE kits for FLWs).

8. **Adequate financial allocations and better utilization of available funds to ensure delivery of high impact interventions to address the additional burden and accounting for change in service delivery due to the COVID-19 pandemic.**

- a) Ensuring adequate budgeting and utilization of funds allocated for nutrition programs.
- b) Provision of additional funds to address additional load on health and nutrition services in case of similar health emergencies.

9. **Promoting public private partnerships and engaging with community-based organization in addressing gaps in monitoring of nutrition scenario and nutrition service provisions especially during the pandemic.**

- a) Role of private sector and community-based organizations in supporting the data collection and monitoring of key nutrition indicators was crucial. This may facilitate community mobilisation, and last mile service outreach during emergencies.
- b) Handholding and capacity building of FLW while partnering with the private sector should be encouraged and is vital to efficiently deal with emergencies like the current COVID-19 pandemic.
- c) Effectively mobilizing other community resources such as Panchayati Raj Institutions, urban Local bodies and community organisations like SHGs to support government initiatives for nutrition during pandemic.



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CHAPTER 1: Introduction

1.1 Background

India reported its first case of COVID-19 on January 30, 2020, after which the country underwent three waves of the COVID pandemic and till April 2022, the total number of reported cases was more than 43 million (mygov.in/covid-19, accessed on 28.04.22). To prevent community transmission of the infection and to gear up medical preparedness, Government of India had imposed the first nationwide lockdown on 25th March 2020. This was later lifted from June 2020 in a phased manner. The three waves of pandemic came with an economic cost, food insecurity and cascading impact on all the sections of society (Oxfam, 2022, IFPRI, 2020). Different global studies predicted increase in wasting and stunting among children, increasing micronutrient deficiencies and adverse impact on maternal health outcome (Osendarp et al., 2021).

The disruption of health care services along with diversion of workforce to COVID management (Accountability Initiative, 2020) and mobility restrictions (UNICEF, 2020), lead to a reduction in accessibility and utilization of essential health and nutrition services (UNICEF monitoring, accessed on 03.05.2022). After the first lockdown, targeted efforts to mitigate the ill-effects by redeploying human resource to provide service delivery while adhering to COVID protocols was undertaken. Similarly, utilizing digital technology to provide contactless service delivery during the pandemic was also another highlight (Nyugen et al., 2021) and mobility restrictions (UNICEF,

2020), lead to a reduction in accessibility and utilization of essential health and nutrition services (UNICEF monitoring, accessed on 03.05.2022).

After 2 years of dealing with the pandemic, it is vital to reflect on the learnings to build back better and develop a more resilient health and nutrition delivery system for future emergencies. Therefore, it is imperative to assess, systematically document, and identify gaps in information to understand the impact of COVID-19 on food and nutrition scenario in India during the different phases of the pandemic.

1.2 Objectives of the review

The overarching aim of this situational overview report is to assess the two year-long impact of COVID-19 pandemic on nutrition status, food access and continuity of essential health and nutrition services in India and identify the data gaps within these domains. All the literature documented in the report are source authenticated and most have been assessed for the strength of evidence.

1.3 Methodology

UNICEF India with support from Public Health Foundation of India (PHFI) and Nutrition Development Partners have compiled the situational overview on the impact of the COVID-19 pandemic on nutrition from March 2020 to April 2022. UNICEF’s Conceptual Framework on the determinants of maternal and child nutrition, 2020 has been contextualized to the COVID-19 situation of the country to systematically present this report on the impact of the pandemic on nutrition in India (Figure 1).

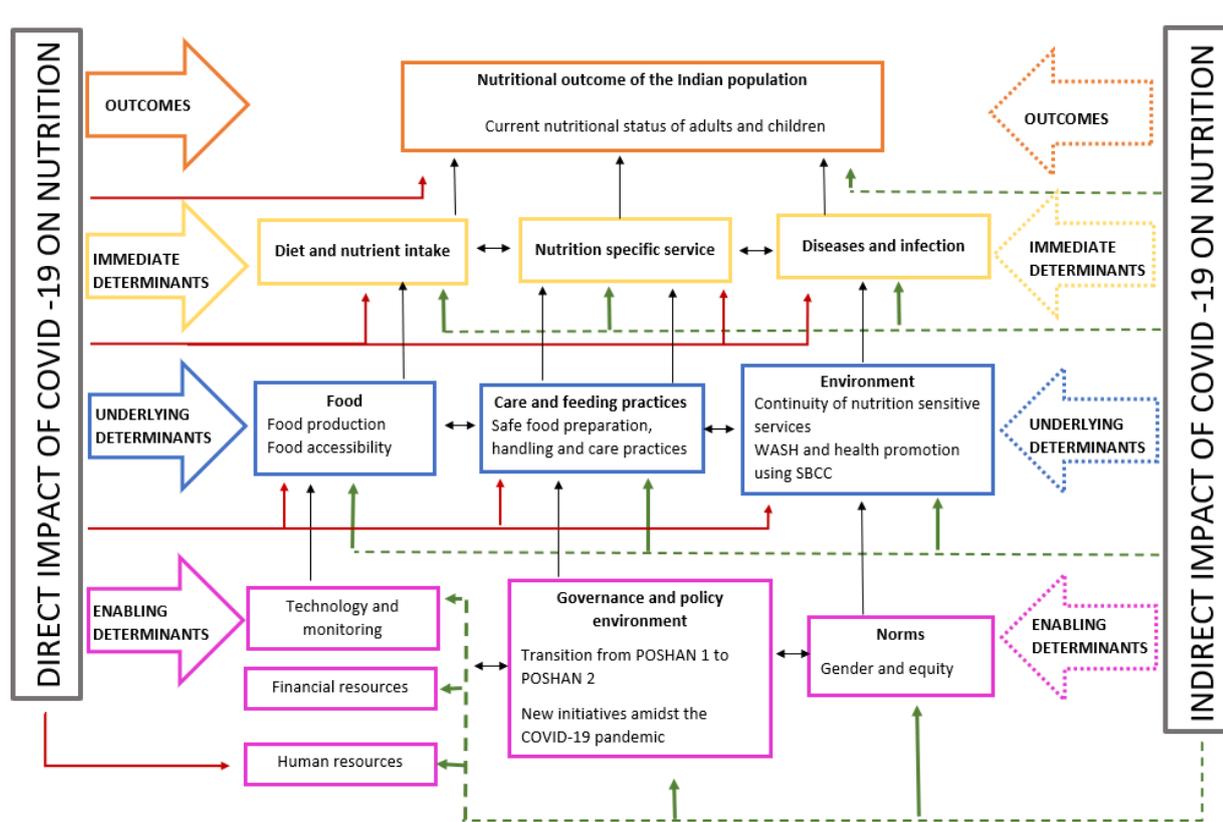


Figure 1: Conceptual framework to assess the impact of COVID-19 on nutrition among the Indian population

Based on the framework (Fig 1), studies on nutrition, food security and public health and nutrition service delivery were identified. These studies were reviewed to understand how nutritional status was affected during the COVID-19 pandemic in India.

This report captures evidence on changes in dietary intake, continuity of nutrition specific services and food security via social safety nets. Studies on use of services, such as Antenatal Care (ANC), Social and Behaviour Change Communication (SBCC) and Water, Sanitation and Hygiene (WASH) were also covered. Finally, studies that assessed governance, policy environment and resource allocation were reviewed.

The report has analysed the findings in published and grey literature that collected data on how COVID-19 affected nutrition in India. This report is a compilation of data from peer reviewed literature, government reports, reports from developmental organizations along with monitoring data dashboards.

Initially data was collected from two data repositories, the POSHAN COVID-19 resources by CTARA, Indian Institute of Technology-Bombay and UNICEF (poshancovid19.in) as well as the COVID-19: Analysis of Impact and Relief Measures repository by Azim Premji University (azimpremjiuniversity.edu.in). All studies present in these data repositories were screened and relevant documents in the context of nutrition and COVID-19 were collated.

To conduct complete and exhaustive review of literature, subsequent searches were undertaken using key terms in the conceptual framework (sub domains of all the determinants of nutritional status in adults and children) provided in Figure 1 from PubMed, Google Scholar and websites of developmental organisations. The data extraction was majorly done for the documents published from March 2020 to April 2022. The studies that were identified with relevant data on key thematic areas were assessed for their strength of evidence. News articles were also screened to understand the “nutrition in news” scenario. From these articles, primary sources were traced wherever relevant, studies were integrated into the database, results were summarized and assessed for strength of evidence.

Simultaneously, a manual for strength assessment of the literature retrieved was developed by the core PHFI team. This manual was dynamic in nature and developed through iterative process in consensus with the development partners. Different critical appraisal tools and reporting guidelines for assessing scientific literature were assessed. The manual thus prepared was largely based on [NIH guidelines](#) on quality assessment of studies (Annexure1). Slight modifications were made in the guidelines to aid the practical application (Figure 2). Each document used in the current report was assessed on a set of 6 to 16 question (based on study design), to identify any risk of bias in the scientific document.

Major criteria assessed for primary quantitative studies include quality and clarity of research question, sampling strategy, sample size justification, data analysis, quality and type of variable capturing along with discussion and results. Some criteria for quality assessment of review articles included importance and quality of research question, search strategy and study inclusion criteria, presence of evidence-based statements along with discussion and references. Similar criteria were modified and used for other study designs as well. Based on the questions developed for each study design, each document was assessed subjectively, and the documents were categorized as “high” (★ ★ ★), “medium” (★ ★) or “low” (★) strength evidence. However, in case of data dashboards, these were not assessed for strength of evidence and were denoted with “NR” (Not Reviewed).

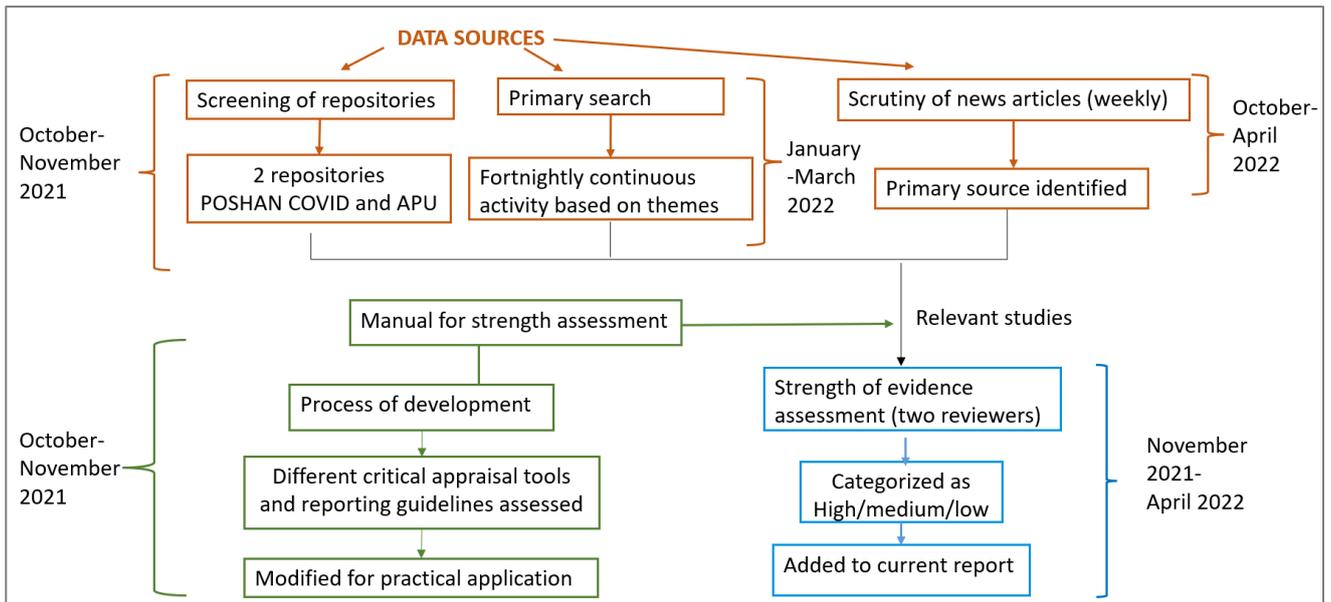


Figure 2: Methodology of data extraction, tool development and strength assessment

As shown in figure 2, 43 articles/reports from pre-decided data repositories and 124 articles/reports from primary search were reviewed using the manual for strength of evidence assessment. A total of 167 documents were reviewed as part of this project and findings from 144 reviewed documents are included in the current report.

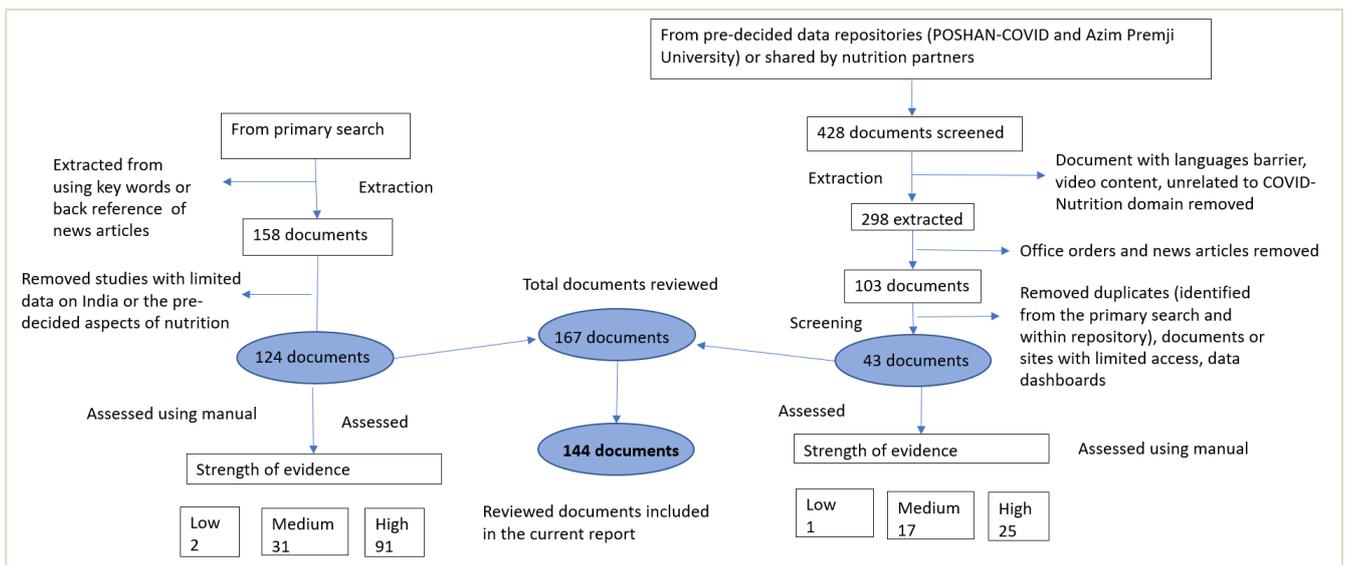


Figure 3: Distribution of documents extracted, reviewed and included in the report



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CHAPTER 2: Impact of COVID-19 on nutritional status in Indian population

The COVID-19 pandemic and the resulting disruptions have posed serious risks to the nutritional status of the population, especially children and women in India ([Dalberg, 2022](#)). This chapter has examined the possible impact of pandemic on the nutritional status of the Indian population with specific focus on women and children.

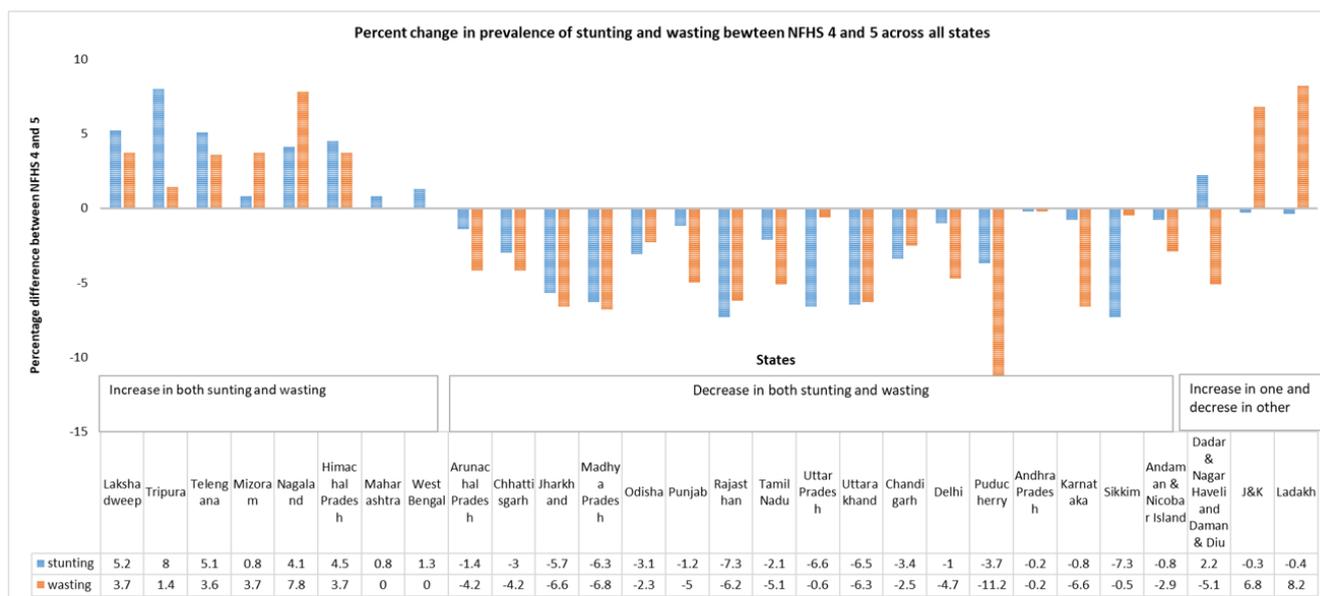
2.1 Nutritional status of children and adolescents during COVID-19 pandemic

There is paucity of data on nutritional status of children during pandemic. The most recent data from NFHS-5 shows that, as compared to NFHS 4, majority states/UT (17¹) reported a decrease in both stunting and wasting. While 3² states showed increase in either one, about 5³ states/UT showed an increase in both stunting and wasting (Fig. 4). However, part of the NFHS 5 survey was conducted before the onset of pandemic and part of it during the pandemic, so, findings of this survey cannot give a complete picture to understand the impact of the pandemic itself.

¹ Arunachal Pradesh, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, Chandigarh, Delhi, Puducherry, Andhra Pradesh, Karnataka, Sikkim, Andaman & Nicobar Islands,

² Dadar & Nagar Haveli, J&K, Ladakh

³ Lakshadweep, Tripura, Telangana, Mizoram, Nagaland, Himachal Pradesh, Maharashtra, West Bengal



Data source: NFHS 4 and 5

Figure 4: Percent change in prevalence of stunting and wasting between NFHS 4 and 5

Limited studies are available in the public domain that have measured the change in anthropometric measures of the children amidst the pandemic. Three documents that were reviewed to provide an insight on the impact of COVID-19 on nutritional status of children and adolescent are compiled in Table 1 below.

Table 1: Documents included in this review on the nutritional status of children and adolescents during COVID-19 pandemic

No	Title (Author/organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Serial cross sectional, Gadchiroli, Maharashtra	Children under 5years of age, malnutrition indicators	Pre-COVID (2019): Stunted:42.1% Underweight 44.2 % Wasted- 25.3% LBW babies- 31.7% During-COVID (2021): Stunted:44.0% Underweight:43.4% Wasted:23.9% LBW babies:41.8% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
2.	Impact of lockdown for COVID-19 pandemic in Indian children and youth	Cohort, Pune Maharashtra	T1DM patients (5 to 20 years), Weight change	December 2019- March2020 After lockdown:	★★

	with type 1 diabetes from different socio-economic classes(Shah et al., 2021)			significant weight gain (p<0.05) without changes in the BMI z-scores and insulin requirements change in Z score - 0.3±0.9 to -0.2±0.9 Sample: 77 children and youth (5-20 years). Sample size: 77	
3.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children, 2021)	Cross sectional, Delhi	Under 5 children, acute and chronic malnutrition	November,2020 25.0% U5 children stunted 10.0% wasted, 21.0% were under-weight. 2.0% children aged 6-59 months had SAM 10% children had MAM (pre-COVID comparison not available). Sample: 232 U5 children	★★★
4.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) endline report on key indicators (TATA Trust, Chandrapur, 2021)	Serial cross sectional, Chandrapur Maharashtra	Under 5 children, malnutrition indicators	Pre-COVID (2019): LBW:25.2% Stunting:38.6% Underweight:37.2% Wasting:19.9% During-COVID (2020): LBW:22.9% Stunting:34.4% Underweight:31.9% Wasting:19.8% (Intervention data, CI for the pre-post comparison not available). Sample: 450	★★★

As presented in Table 1, 4 reports were reviewed to understand impact of COVID-19 on the nutritional status of children and adolescent. Only 1 study among type 1 diabetes mellitus(T1DM) patients was available on nutritional status of adolescent population. Pre-pandemic data highlighted high level of malnutrition among children from tribal district (Chandrapur, Gadchiroli) of Maharashtra. Even during the pandemic, situation of nutritional status was consistently poor among children from these tribal areas ([TATA Trusts, 2021](#)). Similar trends were observed in a small-scale data collected during the pandemic period (November 2020), from the slum settlements of Delhi ([Save The Children, 2021](#)) showed lower prevalence of undernutrition among children under 5 years of age as compared to pre-pandemic NFHS 4 state level data. While the pre-pandemic prevalence of stunting was 31.9%, wasting was 15.9% and underweight was 27.0%, the survey recorded 25.0%, 10.0% and

21.0% prevalence rates for the respective indicators. However, the sample size of 232 children in a specific geographic locality cannot be compared with of the overall State scenario ([NFHS 4, 2015-16](#)).

A small study on children and adolescents suffering from type 1 Diabetes Mellitus (in the city of Pune however, documented healthy weight gain. Though this may not be directly attributed to the pandemic, a steady daily routine adopted during the lockdown might be attributed to this outcome.

Due to limited number of studies with small sample size and paucity of data at the state or national level in the public domain we cannot conclusively say, if the COVID had worsened the nutritional status of the children. There is a need for active surveillance system that would capture key nutritional indicators for precise estimates to gauge the situation.

2.2 Nutritional status of adults during COVID-19 pandemic

The triple burden of malnutrition (undernutrition, micronutrient deficiencies and overweight and obesity) among the adult population was evident from the recent NFHS 5 survey. While, there was a reduction in prevalence of underweight among women by 18.7% and among men by 16.2% between NFHS 4 and NFHS 5, high prevalence of overweight (20.6% among women and 22.9% among men) and anaemia (57.0%) among women of reproductive age was also seen ([NFHS 5, 2019-21](#)). Since the above data cannot be used to capture the effect of pandemic, a review of the relevant documents was undertaken and are listed in the Table 2.

Table 2: Documents included in this review on the nutritional status of adults during COVID-19 pandemic

No.	Title (Author/organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Impacts on dietary habits and health of Indian population during COVID-19 lockdown (Kumar et al., 2020)	Cross sectional, 13 states ⁴	12 to 60 years, change in body weight	During lockdown: Weight gain: 11.0% Weight loss: 33.0% Sample size:100	★★
2.	Impact of COVID-19 outbreak on lifestyle behaviour: A review of studies published in India (Rawat et al., 2021)	Systematic review, India	18 to 70 year Weight gain	March -August 2020 Out of 11 studies weight gain reported in 3 studies .	★★
3.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Serial cross sectional, Gadchiroli, Maharashtra	Mother, Body Mass Index (BMI)	Low BMI Pre-COVID (2019): 49.8% During-COVID (2021): 41.8% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★

⁴ Andhra Pradesh, Bihar, Delhi, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, West Bengal

4.	Continuity of antenatal care services in Chhattisgarh during COVID-19 (Singh et al., 2021)	Cross sectional, Chhattisgarh	Pregnant women, anaemia	July 2020 mildly anaemic: 40.7% moderately anaemic: 37.3% severely anaemic: 0.2%. (Pre-COVID data not available) Sample size: 1483 from 8 districts	★★
5.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children, 2021)	Cross sectional, Delhi	Pregnant women, nutritional status	November 2020 Undernourished (MUAC measurements < 23cm) pregnant women: 35.0%. Sample: 184 mothers, 23 pregnant women and 15 lactating women were interviewed. Anthropometric measurements of 232 under five children and 20 pregnant women were also taken (Pre-COVID data not available)	★★★
6.	Effect of COVID-19 lockdown on the lifestyle and dietary diversity of women handloom workers (Aiswarya, et al., 2021)	Cross-sectional, Kannur, Kerala	Women 30-60 years, body weight	After lockdown: Increase in BMI Increase in body weight 71.3% respondents (p-value < 0.05). Sample size: 100	★★★
7.	Effect of COVID-19 pandemic-induced dietary and lifestyle changes and their associations with perceived health status and self-reported body weight changes in India: A cross-sectional survey (Madan et al., 2021)	Cross-sectional, 4 cities ⁵	Adults 18-50 years, body weight	January-February 2021 Increase in self-reported body weight: 65.0% (95% CI 62–68%). Decrease in self-reported body	★★★

⁵ Bangalore, Delhi/ NCR, Kolkata, and Mumbai

				weight: 15.0% (95% CI 12–17%) Sample size:1000	
8.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur, Maharashtra	Maternal BMI	Low maternal BMI Pre-COVID (2019): 47.8% During-COVID (2020): 41.1% (Intervention data, CI for the pre-post comparison not available). Sample: 450	★★★

As documented in Table 2, 8 reports were reviewed to understand impact of COVID-19 on the nutritional status of adults. While some studies reported weight gain among respondents ([Kumar et al., 2020](#), [Rawat et al., 2021](#), [Aishwarya, et al., 2021](#)) others have reported mixed results ([Madan et al., 2021](#)). Among tribal population in Maharashtra that were also project intervention sites, slight increase in women’s BMI was reported ([TATA Trusts, Chandrapur, 2021](#)) ([TATA Trusts, Gadchiroli, 2021](#)). A little more than a third of pregnant women were found undernourished in one small study in Delhi slums during the COVID period, but comparative data from pre-Covid period is not available ([Save The Children, 2021](#)).

Insights from large metropolitan cities showed that there was an increase in weight for both adult women and men of middle to high socio-economic strata, leading to rise in Body Mass Index (BMI). This Weight gain may be attributed to restricted movement caused as a result of work from home culture which added to a pre-existing sedentary lifestyle of adult population in urban areas ([Madan et al., 2021](#)).

Key highlights for nutritional status of the population amidst the pandemic

- Due to non-availability of real time data and limitations of very small studies it not possible to assess the impact of the COVID-19 pandemic on the nutritional status of children, adolescents and adults.
- Lack of national, state and district-level data on anthropometric measures and micronutrient deficiencies assessing the nutritional status of Indian population pre- and post-COVID has been highlighted.



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CHAPTER 3: Impact of COVID-19 on immediate determinants of nutrition

In this chapter we have examined the documents assessing the impact of the COVID-19 pandemic on immediate determinants of nutrition like the dietary intake along with health and nutrition services directed towards different sections of the population.

3.1 Dietary and nutritional intake of the population amidst the pandemic

The following section deals with change in quantity, quality and diversity of diet intake of children and adult population amidst the pandemic.

3.1.1 Feeding practices and dietary intake among infant and children amidst COVID-19

Optimal dietary intake and feeding practices of children is essential for physical and cognitive growth as well as development. Well-nourished children are more likely to be healthy and productive adults. Emergence of COVID-19 pandemic led to changes in dietary intake among this vulnerable section of the population. This may have a potential long-term impact on their overall health and wellbeing ([CRY, 2020](#)). Table 3 provides the compilation of documents reviewed to understand the feeding practices and dietary intake among infant and children amidst COVID-19.

Table 3: Documents included in this review on feeding practice and dietary intake among infants amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Rapid online perception study about the effects of COVID-19 on children (CRY, 2020)	Cross-sectional, 23 states ⁶	Children (0-18 years), eating habits	April 2020, 35.0% respondents reported that the lockdown has impacted the eating pattern of their child to a great extent and 42.0% percent reported that the lockdown has impacted the eating pattern of their child somewhat. However, the study did not investigate the eating habits and pattern of the children. Sample size: 1102	★★★
2.	Learning in times of lockdown: how COVID-19 is affecting education and food security in India (Alvi et al., 2020)	Narrative report, India	School meal beneficiary children, dietary intake	Amidst pandemic, lockdown induced school meal disruption further increased food insecurity among children from poor settings Sample: Not Applicable	★★★
3.	Palghar project spotlight, an ICDS system strengthening initiative: End of project evaluation (TATA Trusts, Palghar, 2020)	Serial cross sectional, Palghar Maharashtra	Diet diversity, children (Under 5 years)	About 35.0% children had Minimum Dietary Diversity (MDD) (>5 food group) (Intervention data, pre-COVID comparison not available) Sample size:200	★★★
4.	Impact of COVID-19 on household food insecurity and interlinkages with child feeding practices and coping strategies in Uttar Pradesh, India: a longitudinal community-based study (Nguyen et al., 2021)	Cohort, Uttar Pradesh	Children >2, diet diversity	December 2019-August 2020 19.0% children had minimum dietary diversity (≥4 food groups). 1.0% consumed: flesh foods and eggs 4.0% consumed vitamin-A rich fruits and vegetables 30.0% consumed fruits and vegetables 60.0% consumed legumes and nuts. Household food	★★★

⁶ Andhra Pradesh, Karnataka, Tamil Nadu, Telangana, Kerala, Assam, Bihar, Odisha, West Bengal, Jharkhand, National Capital Territory of Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, Madhya Pradesh, Goa, Gujarat, Maharashtra, Chhattisgarh

				insecurity increased sharply from 21% in December 2019 to 80% in August 2020. Sample size: 569	
5.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children, 2021)	Cross sectional, Delhi	Children (6 to 23 months, Dietary diversity	November 2020 Prescribed minimum dietary diversity consumed by 47.0% children aged 6-23 months Minimum meal frequency was seen in 76.0%. Sample size: 232	★ ★ ★
6.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur Maharashtra	Diet diversity, children above 24 months	Minimum dietary diversity (>4 food group) Pre-COVID (2019): 39.6% During-COVID (2020): 57.1% (Intervention data, CI for the pre-post comparison not available). Sample: 450	★ ★ ★
7.	Impact of COVID-19 pandemic on nutritional status of children in India: A systematic review (Banerjee. Et al.,2022)	Systematic review, India	Food security, children	Food insecurity, compromised dietary intake among children- most vulnerable section to get hit hardest.	★ ★ ★
8.	Breastfeeding and COVID-19 (WHO, 2020)	Systematic review, Global	Lactating mother, breastfeeding in pandemic	Coronavirus not traced in amniotic fluid or breast milk and therefore very little evidence exists on its transmissibility during pregnancy or through breast milk. The benefits of breastfeeding far outweigh the risk of transmission. It is therefore recommended to promote breast feeding amidst the pandemic.	★ ★
9.	Safeguarding nutritional opportunities of first 1000 days of life during a pandemic: infant and young children feeding practices in the context of COVID-19 in India (Varghese et al., 2020)	Narrative report, India	Infant and young child, feeding practices	During pandemic irrational use of breastmilk substitutes and feeding equipment (bottles, teats) was seen, due to misconceptions about the transmission of COVID-19 from mother to child	★ ★ ★

10.	Gaps in beliefs and practices of trained breastfeeding counsellors and lactating mothers facing COVID-19 pandemic in India: A quick online quantitative study (BPNI, 2020)	Cross sectional, 22 states	Counsellors, Care knowledge, beliefs and practices	March-April 2020 84.0% respondents correctly identified that nursing by COVID-19 positive mother was safe. 76.0% said expressed breastmilk was safe and 44.0% said that donor human milk was safe.	★★
11.	Estimating the Impact of COVID-19 pandemic related lockdown on utilization of maternal and perinatal health services in an urban Neighbourhood in Delhi, India (Sinha et al., 2022)	Cross sectional, Delhi	Lactating mother, Exclusive breastfeeding	August- November 2020 Reduction in exclusive breastfeeding: after lockdown delivery 64.5% vs. before lockdown delivery 75.7% OR 0.6, 95% CI (0.3–1.1). Sample: 199 women	★★★

As documented in Table 3, 7 documents were reviewed to understand the impact of COVID-19 pandemic on dietary intake of children. During the first wave of pandemic, nationally, 35.0% and 25.0% parents reported changes in eating habits of children ([CRY, 2020](#)). In 2020, in Chandrapur district (intervention site of TATA project), about 57.1% (baseline 39.6%) children had minimum dietary diversity (MDD) ([TATA Trusts, 2021](#)). Under this project one of the key interventions was dietary counselling. The improvement in MDD may be attributed to this intervention. In slum settlements of Delhi, 3.0% children had minimum acceptable diet ([Save The Children, 2021](#)). A population-based study from Uttar Pradesh, highlighted poor dietary diversity. Only 19.0% children were consuming more than 4 food groups. Overall, the consumption of fruits, vegetables, legumes and nuts was found to be low. Children in newly or consistently food-insecure households were less likely to consume a diverse diet (adjusted OR, AOR 0.57, 95% CI 0.34 to 0.95 and AOR 0.51, 95% CI 0.23 to 1.12, respectively) compared with those in food-secure households. Households with consistent food insecurity were more likely to engage in coping strategies such as reducing other essential non-food expenditures, borrowing money to buy food, or selling household assets and jewellery to obtain foods. This was observed for newly food-insecure households as well.

During the first year of pandemic, there were some myths and taboos associated with IYCF practices ([WHO, 2020](#)). Evidence from low-income pockets of Delhi highlighted a reduction in exclusive breast feeding of infants ([Sinha et al., 2022](#)). Reduction was attributed to fear of passing COVID-19 infection to the child. However, another study identified that 84.0% IYCF counsellors believed that breastfeeding by COVID positive mothers was safe and 44.0% respondents considered donor breastmilk to be safe for infant consumption ([BPNI, 2020](#)).

Since the pandemic has caused significant impact on livelihoods of people along with rising food prices, it is likely that the quality of food intake may have suffered leading to long term nutritional impacts. However, there is paucity of data at national level. NFHS-5 data shows slight improvement in dietary adequacy of children 6-23 months of age (increased from 9.6% in 2016 to 11.3% in 2021; the level remains dismally low. There is a risk that the pandemic may have reversed the improvement. A household food consumption and expenditure study may throw light on the food consumption patterns at a national level.

3.1.2 Dietary and nutritional intake of adult population

The following section deals with change in quantity, quality and diversity of diet intake among adult population amidst the pandemic. Table 4 provides the compilation of documents reviewed understand these changes.

Table 4: Documents included in this review on dietary and nutritional intake of adult population amidst the pandemic

No.	Title (Author/organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Impact of COVID-19 lockdown on the dietary pattern and physical activity of people (Sandhu et al., 2020)	Cross sectional, 5 states ⁷	Adults (21-60+ years), Dietary behaviour	April 2020 Reduced: intake of non-vegetarian food Increased: intake of immunity boosting food – warm water, turmeric milk. Sample size: 90 respondents	★★★
2.	Workers in the time of COVID 19 Evidence from a rapid assessment in Bihar (ActionAid, 2020)	Cross sectional, 15 districts of Bihar ⁸	Informal workers, Dietary intake	May 2020 More than 50.0% of workers reduced their food consumption to once in a day due to lack of income. Sample size: 117 migrant workers	★★★
3.	Food consumption pattern and food handlers' hygienic practices during COVID-19 outbreak among South Indian population (Devagappanavar et.al, 2020)	Cross sectional, Gadag (Karnataka)	Women (20-60+), Consumption pattern	February-March 2020 Increase in consumption of vegetarian diet: 47.6% (pre pandemic), 86.4% (during pandemic). Increase in consumption of green leafy vegetables (from 63.7% to 84.7%). Sample size: 124	★★
4.	Palghar Project Spotlight, an ICDS system strengthening initiative: End of project evaluation (TATA Trusts, Palghar, 2020)	Serial cross sectional, Palghar Maharashtra	Mothers, Diet diversity	2020, Overall, 49.2% mothers had minimum dietary diversity (>5 food group) (Intervention data, pre-COVID comparison not available). Sample size:200	★★★

⁷ Punjab, Kerala, Maharashtra, Gujrat, Bihar

⁸ Khagadiya, Shivghar, Begusarai, Banka, Patna, Gaya, Samastipur, Supaul, Sitamarhi, Sheikhpura, Jamui, Muzzafarpur, Purnea, Madhepura, Nawada

5.	Impacts on dietary habits and health of Indian population during COVID-19 lockdown (Kumar et al., 2020)	Cross sectional, 13 states ⁹	Adults (12 to 60 years) Consumption in pandemic	Skipping breakfast: 37.0%. Reduction in consumption: meat/fish, carbonated beverages Increase in consumption- fruits and vegetables. Sample: 100 participants	★
6.	Impact of COVID-19 outbreak on lifestyle behaviour: A review of studies published in India (Rawat et al., 2021)	Systematic review, India	Adults (18 to 70 years) Dietary intake	March-October 2020 Increase in healthy eating like consumption of vegetables, fruits, reduction in unhealthy snacking.	★
7.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Serial cross sectional, Gadchiroli (Maharashtra)	Maternal diet diversity	Minimum dietary diversity (>4 food group) Pre-COVID (2019): 38.3% During-COVID (2021): 72.2%. (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
8.	Effects of nationwide COVID-19 lockdown on lifestyle and diet: An Indian survey (Singh et al., 2021)	Cross sectional, 5 states ¹⁰	Adults (18-81 years), dietary intake	May 2020, Junk food consumption reduced by 79.8%. Prevalence of smoking and drinking alcohol decreased during lockdown. Sample size: 1008	★★
9.	Impact of the COVID-19 pandemic on agricultural production, livelihoods, and food security in India: baseline results of a phone survey (Jaacks et al., 2021)	Cross sectional study, 12 states ¹¹	Farmers, food security	May 2020, Landless farmers were 10 times more likely to skip a meal (in comparison to big farmers). Small/marginal farmers were roughly 3 times more likely to skip a meal. Sample: 1437 farmers	★★★

⁹ Andhra Pradesh, Bihar, Delhi, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, West Bengal

¹⁰ Punjab, Himachal Pradesh, Haryana, Delhi, and Chandigarh

¹¹ Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Punjab, Rajasthan, Telangana, Uttar Pradesh, West Bengal, Haryana and Maharashtra

10.	Survey finds severe impact of second wave on nutrition and employment (KISLAY,2021)	Cross-sectional, Tamil Nadu and Uttarakhand	Informal workers, Dietary intake	May 2021 Workers from Tamil Nadu reduced consumption of fruits (99.1%), oil (97.5%) and milk (98.3%) Workers from Dehradun reduced consumption – amount of fruits (26.0%), oil (31.0%) and milk (38.0%). Sample size:1029	★
11.	Baseline study for Vision Healthy India project: fight against the silent emergency in Delhi (Save The Children,2021)	Cross sectional, Delhi	WRA, MDD	November 2020, Women in the reproductive age (WRA) had low minimum dietary diversity at 38.0%. Sample:222 women of reproductive age (WRA)	★★★
12.	Effect of COVID-19 lockdown on the lifestyle and dietary diversity of women handloom workers (Aishwarya, et al., 2021)	Cross-sectional, Kannur Kerala	women workers (30-60 years), dietary intake of	Post lockdown: Low diet diversity 90.7% respondents reported to downgraded lifestyle. Significant reduction in consumption of pulses, fish, chicken, milk, milk products and dietary micronutrients. Sample size: 100	★★★
13.	Effect of COVID-19 pandemic-induced dietary and lifestyle changes and their associations with perceived health status and self-reported body weight changes in India: A cross-sectional survey (Madan et al., 2021)	Cross sectional, 4 metropolitan cities ¹²	Adults (18-50 years), high SES, Eating behaviour	January-February 2021 Positive improvements in dietary habits, e.g., eating more nutritious (85.0% of participants) and home-cooked food (89.0%) and an increase in overall nutrition intake (79.0%), were observed. There were some negative changes, e.g., more binge eating (69.0%), eating more in between meals (67.0%), and increasing meal portion size (72.0%). Two-thirds of participants reported no change in lifestyles, whereas 21.0%	★★★

¹² Delhi, Kolkata, Mumbai, Bangalore

				and 23.0% reported an increase, and 13.0% and 10.0% reported a decrease in physical activity and sleep, respectively.	
				Sample size: 1000 adults	
14.	COVID-19 and women's nutrition security: panel data evidence from rural India (Gupta et al., 2021)	Cohort, 3 states ¹³	Women's diet	May 2019 and May 2020 Decline in women's dietary diversity score, 5.04 reduced to 4.66 (p<0.05)	★★★
				Sample: 155 households	
15.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur (Maharashtra)	Maternal, Diet diversity	MDD (>4 food group) Pre-COVID (2019): 42.7% During-COVID (2020): 61.6%. (Intervention data, CI for the pre-post comparison not available).	★★★
				Sample: 450	
16.	Maternal dietary diversity during lactation and associated factors in Palghar district, Maharashtra, India (Rajpal et al., 2021)	Cross Sectional, Palghar (Maharashtra)	Lactating mother, MDD	May-June 2020 MDD- 56.5% (95% CI: 37.4; 73.8) Prevalence of mother with higher MDD-High SES (73.1%; 95% CI: 45.2; 89.9) Counselled lactating mothers more likely to consume diversified diet (OR: 2.37; 95% CI: 0.90; 6.26)	★★★
				Sample size:200	
17.	Dietary behaviours and food choices during online and physical classes: A comparative study among college going girls (18-25 years) studying in Delhi (Manral et al., 2022)	Cross sectional, Delhi	College going girls (18 to 25 years), dietary behaviour	January 2021, No significant difference was found between the number of meals eaten per day during online and physical classes as p> 0.05 (p= 0.059, Chi-Square value = 7.43). During online class- Increase in consumption of baked goods, fruits and	★★★

¹³ Bihar, Odisha, Uttar Pradesh

				salads and homemade food. Decrease in consumption of carbonated beverages, binge eating.	
				Sample:110 college students	
18.	Food pattern link to COVID-19: the role of diet and nutritional supplement during a worldwide health catastrophe (Baisya et al., 2022)	Cross sectional, parts of India	Different age group, Food preference	97.0% of the respondents opted for home cooked food. Stockpiling food was common.	★★★
				Sample size:130	
19.	COVID-19 livelihoods survey (APU, 2020)	Cross sectional, 12 states ¹⁴	Informal workers, household dietary intake	April-May 2020 92.0% of urban household consuming less food than before.	★★
				Sample: 5000	
20.	COVID-19 induced Lockdown – How is the Hinterland Coping? (Aga Khan Rural Support Program, 2020)	Cross sectional, 47 districts, 12 states ¹⁵	Rural household, household dietary intake	May 2020 Reduced food item in each meal: 68.0% household. Reduced number of meals: 50.0% household.	★★
				Sample: 5162	
21.	Impact of COVID-19 on Indian villages (Modak et al., 2020)	Qualitative, 10 states ¹⁶	Farming HH, dietary diversity	April 2021 Reduction or elimination eggs, meat, and fish from their diets due to increased food prices and low farm produce	★★★
22.	Reduced food and diet quality, and need for nutrition services during COVID-19: Findings from surveys in Bihar and Uttar Pradesh (IFPRI, 2020)	Narrative report, 2 states ¹⁷	Poor household, household dietary intake	April-May 2020, during lockdown shortage of food items in the previous month was reported in 32.0-48.0% household and reduced food intake in 49.0-59.0% household	★★★

¹⁴ 12 states: West Bengal (Rural), Delhi (Urban), Andhra Pradesh (Rural), Gujarat, Maharashtra (Pune), Telangana (Rural), Jharkhand (Rural), Rajasthan, Odisha, Madhya Pradesh (Rural), Karnataka, Bihar (Rural)

¹⁵ Assam, Bihar, Gujrat, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, West Bengal, Tripura, Chhattisgarh

¹⁶ Bihar, Karnataka, Kerala, Maharashtra, Punjab, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal, Madhya Pradesh

¹⁷ Bihar, Uttar Pradesh

23.	State of working India 2021 (APU, 2021)	Cross Sectional, India	Workers, household Dietary intake	March-December 2020 90.0% household suffered reduction in food intake as a result of the lockdown Sample: 2788 workers from CLIPS survey	★★
24.	Determinants and Dynamics of Food Insecurity during COVID-19 in Rural Eastern India (Kumar et al., 2022)	Cross sectional, 5 states ¹⁸	Rural household, Food security	April-May 2020 Worried about not having enough food to eat- 52.0% household Unable to eat healthy and nutritious food during lockdown- 65.0% household. Sample: 4,082	★★
25.	Diet diversity of urban households in India during the COVID-19 lockdown (Aneesh, 2021)	Cross sectional, 7 cities ¹⁹	Upper SES urban household, household dietary diversity	April-June 2020 84.0% of household had low diet diversity Overall, limited access and availability of animal products reported. Sample: 450 households	★★★
27.	Effect of COVID-19 pandemic on food systems and determinants of resilience in indigenous communities of Jharkhand state, India: A serial cross-sectional study (Ghosh-Jerath et al., 2022)	Serial cross sectional, Jharkhand	Tribal household, dietary diversity	May-June 2020 and September-October 2020 Change in diet 43.3% household reported change in diet during lockdown which decreased to 21.9% after lockdown (p <0.866) Increased consumption of locally grown indigenous food	★★★
28.	COVID lockdown, how people managed and impact of welfare schemes on informal sector workers: Evidence from Delhi slums (Das et al., 2020)	Cross sectional, Delhi	Informal workers, household dietary intake	April-May 2020 Missed breakfast: 66.0% households. Hungry for at least one day: 21.0% households. Consuming sufficient meals: only 19.0% households. Sample: 199 slum households	★★★

¹⁸ Bihar, eastern Uttar Pradesh (UP), Jharkhand, Odisha, and West Bengal

¹⁹ Mumbai, Pune, Bengaluru, Hyderabad, Chennai, Delhi and Kolkata

29.	Transformation in culinary behaviour during the COVID-19 pandemic: In-depth interviews with food gatekeepers in urban India (Menon et al., 2022)	Qualitative study, Mumbai	Food gatekeepers, food preparation	March-June 2021 Food preparation and intake was influenced by health and immunity benefits Sample size: 34	★★★
30.	A hidden cost: The pandemic's impact on nutrition (Accountability Initiative, 2020)	Narrative report, India	General population, household dietary intake	In lockdown Shortage of food items 32.0%-48.0% household Reduced food intake: 49.0-59.0% of household	★★★
31.	Hunger and food security in the times of COVID-19 (Sinha, 2021)	Narrative report, India	General population, household dietary intake	In lockdown 77.0% of households consumed less food than before.	★★★
32.	Pandemic, informality, and vulnerability: impact of COVID-19 on livelihoods (Kesar et al., 2021)	Cross sectional, 12 states ²⁰	Farming household, household dietary intake	April-May 2020 Rural and in particular, farmer households more food secure than those involved in other activities 66.0% of farmer households reported consuming less food. Sample: 4942 respondents	★★★
33.	Hunger Watch survey (Right to Food Campaign, 2021)	Cross sectional, 11 states ²¹	General population, household dietary intake	October 2020 Reduction in food consumption (compared to March 2020) reported by respondents, Rice/Wheat (53%), Pulses (64%), green vegetables (72%), egg/meat (79%) Sample size: 3994 households	★★

As documented in Table 4, 33 studies were reviewed to understand the positive and negative changes in dietary intake and behaviour among different segments of the adult population from different states amidst the pandemic. On the positive side, in the early phase of pandemic, a rise in consumption of food items perceived as immunity boosting was seen ([Sandhu et al., 2020](#), [Singh et al., 2021](#), [Kumar et al., 2020](#)). Two studies reported that the frequency of eating food from outside reduced considerably due to lockdown and fear of contracting

²⁰West Bengal (Rural), Delhi (Urban), Andhra Pradesh (Rural), Gujarat, Maharashtra (Pune), Telangana (Rural), Jharkhand (Rural), Rajasthan, Odisha, Madhya Pradesh (Rural), Karnataka, Bihar (Rural)

²¹Chhattisgarh, Delhi, Gujrat, Jharkhand, Maharashtra, Madhya Pradesh, Rajasthan, Telangana, Tamil Nadu, Uttar Pradesh, West Bengal

COVID-19 ([Baisya et al., 2022](#), [Madan et al., 2021](#)). One study showed junk food consumption reduced by 79.8%, as well as prevalence of smoking and drinking alcohol decreased during lockdown ([Singh et al., 2021](#)). These positive changes may be attributed to the general health awareness created by Government and non-government agencies during lockdown through mass media and social media, and also to some extent due to restricted mobility and restrictions on restaurants and other places of public gathering. On the other hand, poor diet diversity among the adult population irrespective of socio-economic status was also observed. Reduction in consumption of certain food groups such as pulses, non-vegetarian foods, milk and milk products, oil, fruits and vegetables in different parts of India was reported by different studies ([Gupta et al., 2021](#), [Aishwarya, et al., 2021](#), [KISLAY,2021](#), [Jaacks et al., 2021](#)).

Change in meal frequency was observed among the working class especially from the rural areas. More than 50.0% of workers in informal sector from Bihar reduced their food consumption to once in a day due to lack of income ([ActionAid, 2020](#)). Farmers in India also reported to have reduced the total food intake, with food insecurity disproportionately affecting the landless and the small farmers ([Jaacks et al., 2021](#)). Despite special PDS, direct benefit transfer, and ration from anganwadis reaching 80%, 50%, and 30% of surveyed households, respectively, a study from 3 Indian States showed a decline in household food expenditure and women's dietary diversity particularly for non-staples like meats, eggs, vegetables and fruits in May 2020 compared to May 2019 ([Gupta et al., 2021](#)), that is further accentuated by women's disproportionate vulnerability to economic shocks, non-inclusion of non-staple grains in food safety net programmes, and restricted markets and limited access and availability of diverse nutritious foods. Low dietary diversity score for pregnant women especially from the tribal districts of Maharashtra was seen, however improvements were seen in the scores from targeted counselling interventions ([Rajpal et al., 2021](#), [TATA Trusts, 2021](#)). Apart from reduction in diversity in diet the quantity of food consumption was also greatly affected, especially in the communities from low socio-economic settings. In the urban slums of Delhi, the overall food consumption of household was lower than pre-pandemic consumption. In this population, 92.0% of households consumed less food than before, 66.0% missed breakfast, only 19.0% had sufficient meals (Delhi) ([Das et al., 2020](#)). Shortage of food items or reduction of food intake was reported in different States ([IFPRI, 2020](#), [Right to Food Campaign, 2021](#)). On the positive side, in tribal areas of Jharkhand, increased consumption of locally grown indigenous food was reported ([Ghosh-Jerath et al., 2022](#)).

The above studies show that greater health awareness reinforced positive health behaviour, however, factors like loss of income, home confinement and non-availability of certain food pushed people to an unhealthy dietary pattern. Landless, small farmers and women were disproportionately affected. Sufficient data was available to conclude that there was an overall reduction in food security, and diet diversity especially among socially and economically vulnerable sections. It is important to underscore the resilient traits related to food accessibility that were observed in some of the vulnerable communities. Further, effective BCC strategy and nutrition education for incorporating the local indigenous foods in household diets could be a key strategy to promote food self-sufficiency in specific geographical areas.

3.2 Impact of COVID-19 on continuity of nutrition specific services that have an impact on the immediate determinants of nutrition

To maintain the continuity of essential health and nutrition services during the pandemic in containment, buffer and beyond-buffer zones, guidelines were issued by Ministry of Health and Family Welfare ([MoHFW, 2020](#)). Certain services like those related to pregnancy, newborn care, immunization, management of children with

severe acute malnutrition, adolescent health services, family planning were identified as essential health services. Similarly, guidance was issued by Ministry of Women and Child Development (MoWCD) for opening of Anganwadi centres, provision of supplementary nutrition, growth monitoring, nutrition counselling, pre-school education being provided under ICDS ([MoWCD, 2020](#)).

The following section captures the information on the impact of pandemic on services directed towards different sections of the population.

3.2.1 Impact of COVID-19 on continuity of nutrition specific services directed towards infants, young and preschool children

It is essential to understand the effect of pandemic on interventions that address the immediate determinants of foetal and child malnutrition. Key services like growth monitoring, take home ration (THR), home based care for young child (HBYC), infant and young child feeding (IYCF) promotion, iron folic acid (IFA) and vitamin A supplementation (VAS) programs among other services are discussed in the following section.

A. Growth monitoring services

Routine growth monitoring is done in Anganwadi centres to track the physical growth of a child up to 5 years of age. As the nation went into lockdown due to the COVID-19 pandemic, growth monitoring services provided by the Anganwadi centres (AWC) were impacted owing to limited in-person contact and closure of AWC. Table 5 provides the compilation of documents reviewed under this domain.

Table 5: Documents included in this review on growth monitoring services amidst the pandemic

No.	Title (Author, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur (Maharashtra)	Children under 6 years Utilization of growth monitoring services	Utilization of growth monitoring service: Pre-COVID (2019): children below 3 years- 97.3 %; children above 3 years- 98.2% During-COVID (2020): Children below 3 years- 75.7%; children above 3 years- 44.0% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
2.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators	Serial cross sectional, Gadchiroli (Maharashtra)	Children under 6 years Utilization of growth monitoring services	Utilization of growth monitoring service: Pre-COVID (2019): Children below 3 years- 96.7%; children above 3 years- 99.5% During-COVID (2021): Children below 3 years- 72.3%; Children above 3 years- 35.8% (Intervention data, CI for the	★★★

	(TATA Trusts, Gadchiroli, 2021)			pre-post comparison not available) Sample: 450	
3.	Palghar project spotlight, an ICDS system strengthening initiative: End of project evaluation (TATA Trusts, Palghar, 2020)	Serial cross sectional, Palghar Maharashtra	Children under 6 years Utilization of growth monitoring services	Overall utilization of growth monitoring: service Pre-COVID (2018): 69.2% During-COVID (2020): 79.7% (Intervention data, CI for Pre-post comparison not available) Sample size:200	★★★
4.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross sectional, Chhattisgarh	Respondents: Field functionaries, growth monitoring provision	May-June 2021 58.0%: respondents reported growth monitoring being carried out through home visits and Village Health Sanitation and Nutrition Day (VHSND) Sample: 14 DPOs, 30 CDPOs and 45 Lady Supervisors	★★
5.	Effect of COVID-19 on programs aimed at improving health and nutrition status of women and children in Rajasthan (Development Solutions Inc, 2021)	Qualitative study, Rajasthan	Children, growth monitoring provision	Lockdown No growth monitoring between April to June 2020, however it resumed after resumption of Mother and Child Health Days. Sample: 72 community members, 16 AWW and ASHA each and 8 ANMs, other supervisory staff and officials	★★
6.	Monitoring POSHAN Abhiyaan during the COVID-19 pandemic in Rajasthan-2020 (IDInsight, 2021)	Cohort, 7 Districts of Rajasthan ²²	Children under 5 years, Growth monitoring provision	Between January 2020 and May 2020 growth monitoring fell by 48.0% from 61.0% in January 2020 to 13.0% in May 2020 Sample: 1140	★★★
7.	Continuity of service tracking, UNICEF (PoshanCovid 19.in)	Dashboard, India	Children, Growth monitoring	Dec 2021 Growth monitoring had resumed in all 14 States by Dec 2021. ²³	NR
8.	COVID-19 disrupted provision and utilization of health and nutrition services in Uttar Pradesh, India:	Cohort, Uttar Pradesh	Children, growth monitoring	During the lockdown, only 5.0% FLWs reported conducting child growth monitoring Sample: 313 FLWs	★★

²² Ajmer, Baran, Bhilwara, Bikaner, Jhalawar, Jodhpur, Tonk

²³ Assam, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha and Uttar Pradesh and West Bengal

Insights from service providers, household phone surveys, and administrative data
([Nyugen et al.,2021](#))

Table 5 is a compilation of a data dashboard and 7 reports studied and reviewed to understand the impact of the pandemic on growth monitoring services. According to UNICEF’s continuity of service tracking, growth monitoring took place in only 2 states in May-June 2020 but increased to 14 states by November 2021 (Fig 5). There is lack of national level data on coverage of growth monitoring services, but some studies show reduced coverage ([IDInsight, 2021](#), [Nyugen et al.,2021](#), [TATA Trusts,2021](#)). To adapt to the pandemic situation, growth monitoring was conducted during the home visits by Anganwadi Worker (AWW)/ Accredited Social Health Activist (ASHA) ([IDInsight, 2021](#), [Nyugen et al.,2021](#))

This initial disruption in service may be attributed to the AWC closure, deployment of AWW in COVID related tasks, mobility restrictions imposed and fear of virus transmission.

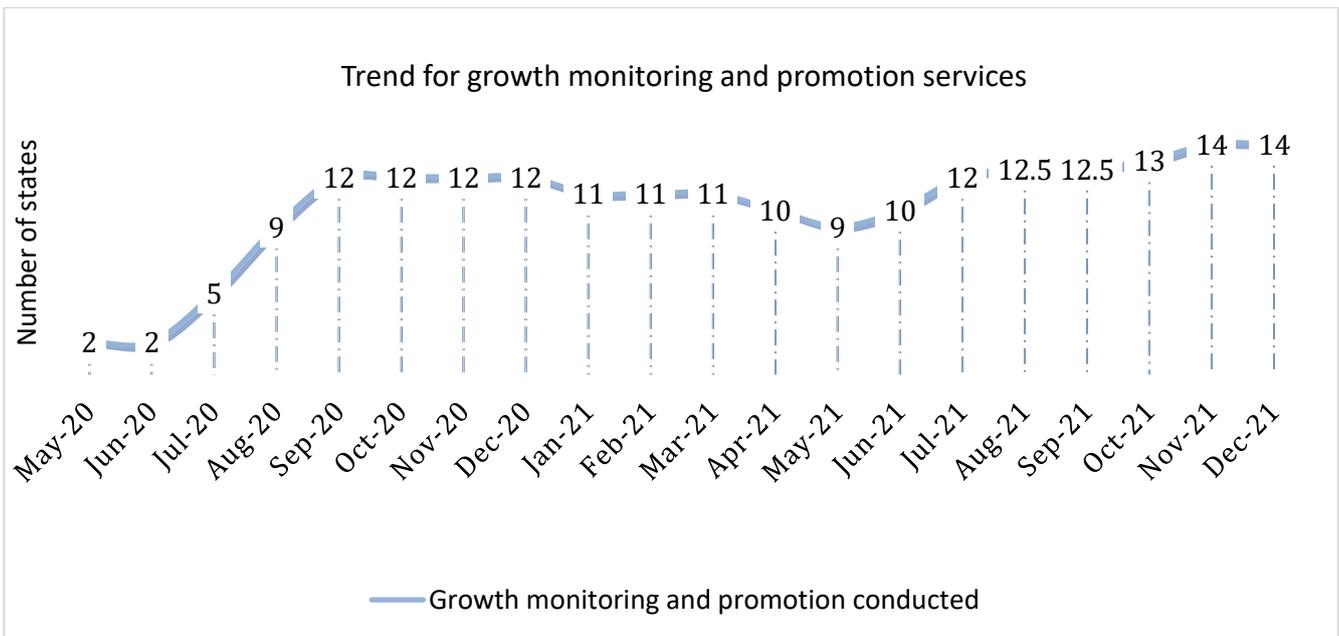


Figure 5: Trend for growth monitoring and promotion services

B. Anganwadi centres and take-home rations (THR) for children (6 to 72 months)

THR remains an important component of Supplementary Nutrition Programme (SNP) under the Integrated Child Development Service (ICDS) scheme to bridge the gap between recommended dietary allowance and average dietary intake of children. Effects of pandemic on THR distribution through Anganwadi centres were reviewed based on the documents compiled in Table 6.

Table 6: Documents included in this review on functional AWC and THR for children (6 to 72 months) amidst the pandemic

No	Title (Author/organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Rapid assessment social protection and relief measures COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF, 2020)	Cross sectional, 26 Gram Panchayats in Andhra Pradesh	Children (6-72 months), THR distribution	April-May 2020 THR for children provided by 80.0% of Gram Panchayat (GPs) THR with eggs, milk-doorstep delivery	★★
2.	Response to COVID-19 by the anganwadi ecosystem in India (KPMG, 2020)	Narrative report	Children (under 6 years), THR distribution	Door to door distribution of THR by AWW for 0-3 years old children, 3-6 years old malnourished children	★★
3.	The State of India's Poor: Volume 1, April – June 2020, Social Group: Schedule Caste (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020)	Cross sectional, 227 urban and rural Schedule Caste locations across 39 districts from 10 states ²⁴	Children, THR distribution	April-June 2020: 35.0% to 40.0% of Schedule Caste hamlets did not receive supplementary nutrition from AWC for children, pregnant or lactating mothers.	★★
4.	Rights of Vulnerable Families and Children of India under COVID-19: Implications for effective response and mitigation strategies (Save The Children, 2020)	Cohort, 16 states and UTs ²⁵	Children, THR distribution	April 2020 and June 2020 31.0% households did not receive THR: 28.0% in rural and 33.0% in urban areas. Sample size: 7239	★★★
5.	Learning in times of lockdown: how COVID-19 is affecting education and food security in India (Alvi et al., 2020)	Narrative report	Children, THR distribution	States like Kerala, Telangana, Karnataka and Andhra Pradesh meals/dry ration are home delivered to anganwadi children	★★★
6.	Palghar project spotlight, an ICDS system strengthening initiative: End of project evaluation (TATA Trusts, Palghar, 2020)	Serial cross sectional, Palghar Maharashtra	Children (under 6 years) THR distribution	SNP received from AWC Pre-COVID (2018): 95.8% During-COVID (2020): 100% (Intervention data, CI for pre-post comparison not available) Sample size:200	★★★

²⁴ Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh

²⁵ Assam, West Bengal, Bihar, Jharkhand, Odisha, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Himachal Pradesh, Andhra Pradesh, Telangana, Tamil Nadu, Jammu Kashmir and Delhi

7.	Take home ration service of the integrated child services scheme Documenting the Status in Select States of India (Khattar et.al, 2021)	Cross sectional, 230 districts of India	THR distribution	Dry rations distributed in 17 districts, ready to eat or cooked food distributed in 90 districts, direct benefit transfers in 16 districts, dry ration plus ready to eat food mix in 5 districts, dry ration plus ready to eat food in 6 districts and no THR was available in 4 districts	★★
8.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Serial cross sectional, Gadchiroli (Maharashtra)	Children under 6 years, THR utilization	Utilization of THR Pre-COVID (2019): Below 3 years: 100% Above 3 years: 100% During-COVID (2021): Below 3 years: 66.0% Above 3 years: 36.7% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
9.	Effect of COVID-19 on programs aimed at improving health and nutrition status of women and children in Rajasthan (Development Solutions Inc, 2021)	Qualitative study, Rajasthan	Children (3 to 6 years) THR distribution	April – June 2020 AWWs delivered THR at doorsteps. Post-lockdown (June 2020)-distribution of THR in small batches from AWC. Sample: 72 community members, 16 AWW and ASHA each and 8 ANMs, other supervisory staff and officials	★★
10.	Integrated Child Development Services (ICDS) Scheme in India, Tracking State Government Responses to COVID-19, January-April 2021 (WFP, 2021)	Narrative report, India	Children THR distribution	January-April 2021 Even though Anganwadis were closed in 25 states, supplementary nutrition programme was operational in the above period. In 5 States, Anganwadis were opened but closed again due to Covid surge, Anganwadis remained fully functional in 3 states and no information was available from 2 states.	★★★
11.	COVID-19 response Concurrent Audit of Schemes Operated Under National Food Security Act (State government, 2021)	Cross sectional, Jharkhand	Children below 5 years THR Distribution	April-May 2020 Only 1255 families with children below 5 years received THR (out of 4408 surveyed)	NR

12.	Assessing impact of the COVID-19 pandemic on socio-economic situation of vulnerable population through community-based monitoring (UNICEF, 2021)	Cohort, 7 states ²⁶	Children (6 to 36 months) THR access	June-December 2020 THR access was adversely affected during lockdown (June-July2020) for both pregnant and lactating women but improved subsequently. Overall rural women (77.0%) had better access to THR compared to their urban counterparts (51.0%). Sample: 901	★★★
13.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur (Maharashtra a)	Children under 6 years, THR utilization	Utilization of THR Pre-COVID (2019): Below 3 years- 100% Above 3 years- 100% During-COVID (2020): Below 3 years- 65.9% Above 3 years- 42.4% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
14.	Evidence based response to early childhood development during the COVID-19 crisis (Dalberg, 2022)	Cross sectional, 11 states ²⁷	Children under 6 years, challenges THR	December 2020-February 2021: 43.0% households (children under nine months) faced challenges in receiving food from AWC 47.0% households (child aged 15 months- 6 years): received less/ no food from AWC Sample size: 10112	★★★
15.	Continuity of service tracking, UNICEF (Poshan Covid19.in)	Dashboard, India	Children under 6, THR distribution	Dec 2021 Out of 14 states monitored, AWC were functional in 11 states ²⁸ and THR distribution	NR

²⁶ Uttar Pradesh, Tamil Nadu, Rajasthan, Maharashtra, Andhra Pradesh, Telangana, Gujarat

²⁷ Andhra Pradesh, Assam, Bihar, Haryana, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh

²⁸ Assam, Andhra Pradesh, Bihar, Chhattisgarh, , Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, and Uttar Pradesh; closed in Gujarat, Odisha, and West Bengal

was taking place in 14 states²⁹ in Dec 2021.

As documented in Table 6, a data dashboard and 13 reports were referred and studied under this domain to understand impact of COVID-19 on the continuity of THR services. To mitigate the impact of pandemic, the modality of distribution of THR was modified. THR in most states were home delivered to children, pregnant women and lactating mothers enrolled with their respective AWC in the form of meals/ dry ration, while, Direct Benefit Transfer (DBT) was used in place of hot cooked meal in Bihar (WFP,2021, Khattar et.al, 2021). On the other hand, non-availability of THR for children was evident among 31.0% of household (HH) in 14 states³⁰ (Save The Children, 2020). Data on vulnerable population highlighted poor coverage. About 60.0% of hamlets with Schedule Caste inhabitants were devoid of THR (10 states³¹) (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020). As shown in Figure 6, according to UNICEF's continuity of service tracking, Anganwadi centres mostly remained closed between May 2020 to Sept 2021, however THR supplies continued in most states. As of December 2021, the AWCs were functional in 11 of 14 states while THR distribution was taking place in all 14 States (Poshan Covid19.in). It is important to note that despite AWC not being functional entirely in the last 2 years, the THR distribution to children continued after an initial setback, though the coverage data at national is not available in public domain. Small studies show that the coverage may have been impacted even while the distributions took place across the states.

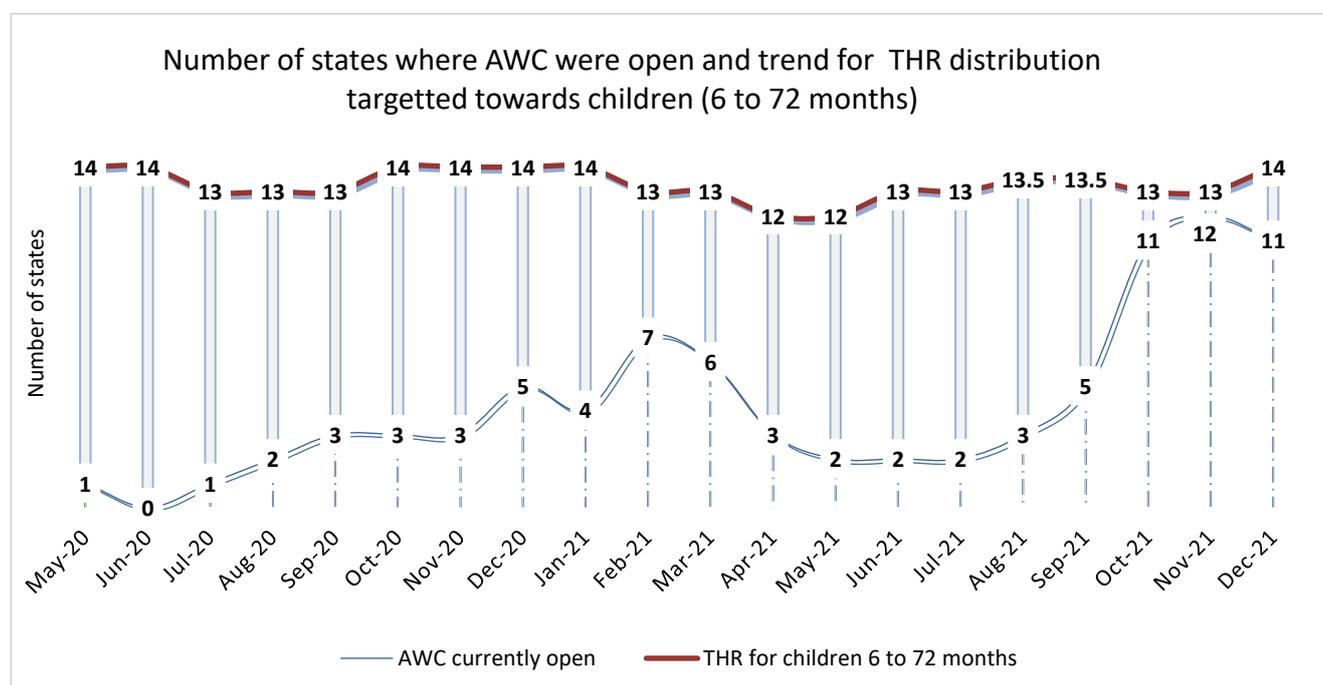


Figure 6: Trends for opening for AWC and provision of THR for children (6 to 72 months)

²⁹ Assam, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha and Uttar Pradesh and West Bengal

³⁰ Assam, West Bengal, Bihar, Jharkhand, Odisha, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Himachal Pradesh, Andhra Pradesh, Telangana, Tamil Nadu, Jammu Kashmir and Delhi

³¹ Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh

C. Promotion of infant and young child feeding (IYCF) -Mothers' Absolute Affection (MAA) program

MAA is an intensified program with an attempt to bring undiluted focus on promotion of breastfeeding, in addition to ongoing efforts through the health systems. Table 7 provides compilation of documents that were reviewed to understand effect of pandemic on this program.

Table 7: Documents included in this review on promotion of Infant and Young Child Feeding (MAA) program amidst the pandemic

No	Title (Author/Organisation, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross Sectional, Chhattisgarh	Respondents: Field functionaries, Breastfeeding counselling provision	May-June 2021 Provision of counselling on breastfeeding and complementary feeding under MAA: 90.0% reported Sample: 14 DPOs, 30 CDPOs and 45 Lady Supervisors	★★
2.	Continuity of service tracking, UNICEF (PoshanCovid 19.in)	Dashboard, India	Mothers, MAA services	Dec 2021 Out of 14 states monitored, MAA services were functional in 13 states ³²	NR

As documented in Table 7, a report and a data dashboard were referred and studied under this domain. MAA program of the Government aims at promoting breastfeeding and complementary feeding for children up to 2 years of age. Limited data was available to understand continuity of this program. A small-scale study from Chhattisgarh ([UNICEF, 2021](#)) demonstrated a good implementation of the program with, about 90.0% service providers from the state reporting that the MAA program was functional. As shown in figure 7, according to UNICEF's continuity of service tracking, as of December 2021, MAA programme was being implemented in 13 out of 14 UNICEF monitored states. Overall trend for this service was found to be relatively stable throughout the duration of pandemic, though the counselling was provided during home visits as Anganwadis remained closed during a substantial part of the pandemic duration. Please also refer to Section 4.2.3 which includes information on care practices during COVID-19.

³² Assam, Bihar, Chhattisgarh, Gujrat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha, Uttar Pradesh and West Bengal; no information from Andhra Pradesh

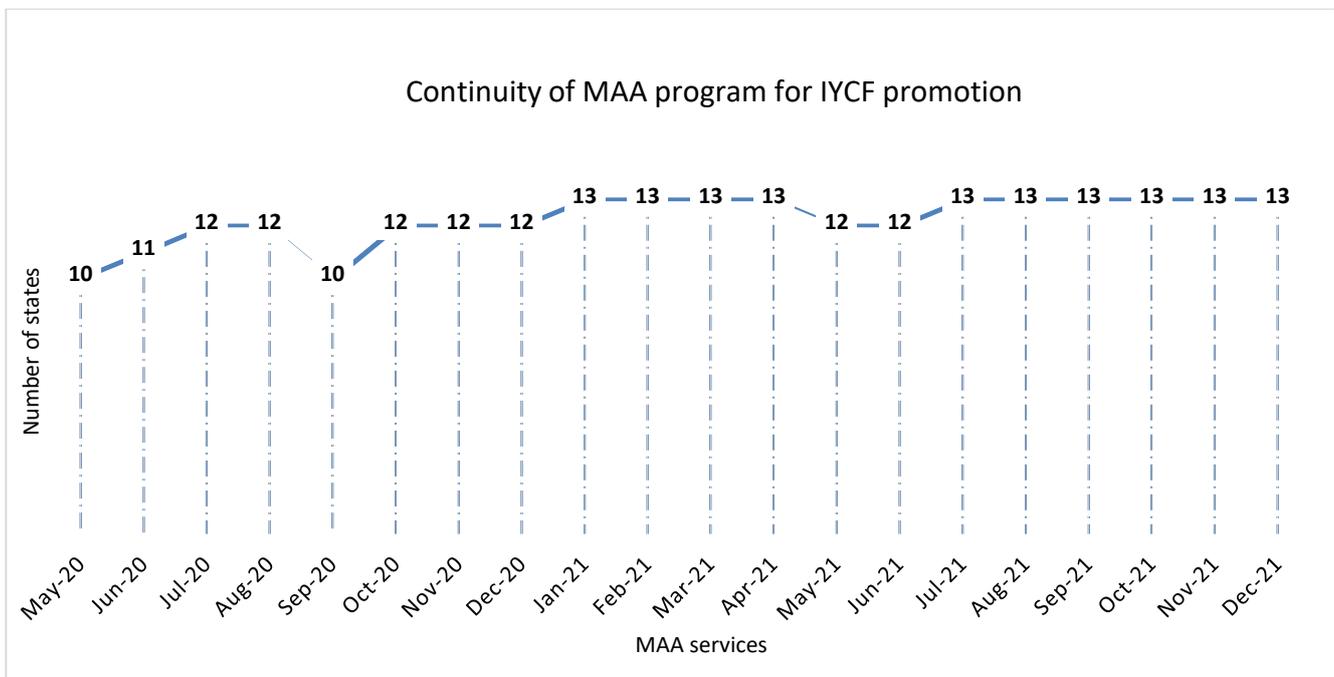


Figure 7: Trend for MAA program for IYCF promotion

D. Home Based Care for Young Child (HBYC) program

HBYC program aims at improving early childhood development through health promoting services targeted towards children up to 15 months of age via home visits by Accredited Social Health Activist (ASHAs). Table 8 provides compilation of documents reviewed to understand the effect of pandemic on this programme.

Table 8: Documents included in this review on HBYC program amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross sectional, Chhattisgarh	Field functionaries, HBYC visits	May-June 2021 70.0% respondents reported HBYC visits were taking place regularly Sample: 14 DPOs, 30 CDPOs and 45 Lady Supervisors	★★
2.	Estimating the impact of COVID-19 pandemic related lockdown on utilization of maternal and perinatal health services in an urban neighbourhood in Delhi, India (Sinha et al., 2022)	Cross sectional, Delhi	Mothers who delivered after October 2019, HBYC visit by ASHA	August- November 2020 ASHA visit among women who delivered post lockdown (51.0%) was lower than women who delivered before lockdown (84.5%); OR-0.2, 95% CI: 0.1-0.4 Sample: 199 women	★★★
3.	Continuity of service	Dashboar	Mothers,	Dec 2021	NR

tracking, UNICEF ([Poshan](#)
[Covid19.in](#))

d, India

HBYC
services

Out of 14 states monitored,
HBYC services were
functional in 12 States by
Dec 2021.³³

As presented in Table 8, a dashboard and 2 reports were studied and reviewed under this domain. About 70.0% of service providers from Chhattisgarh reported that HBYC visits were being regularly provided by them amidst the second wave of pandemic. As shown in figure 8, according to UNICEF's continuity of service tracking, as of Dec 2021 the HBYC services were functional in 12 UNICEF monitored states. The overall trend for HBYC services were low after the first wave of pandemic and has been recovering slowly over the last 2 years.

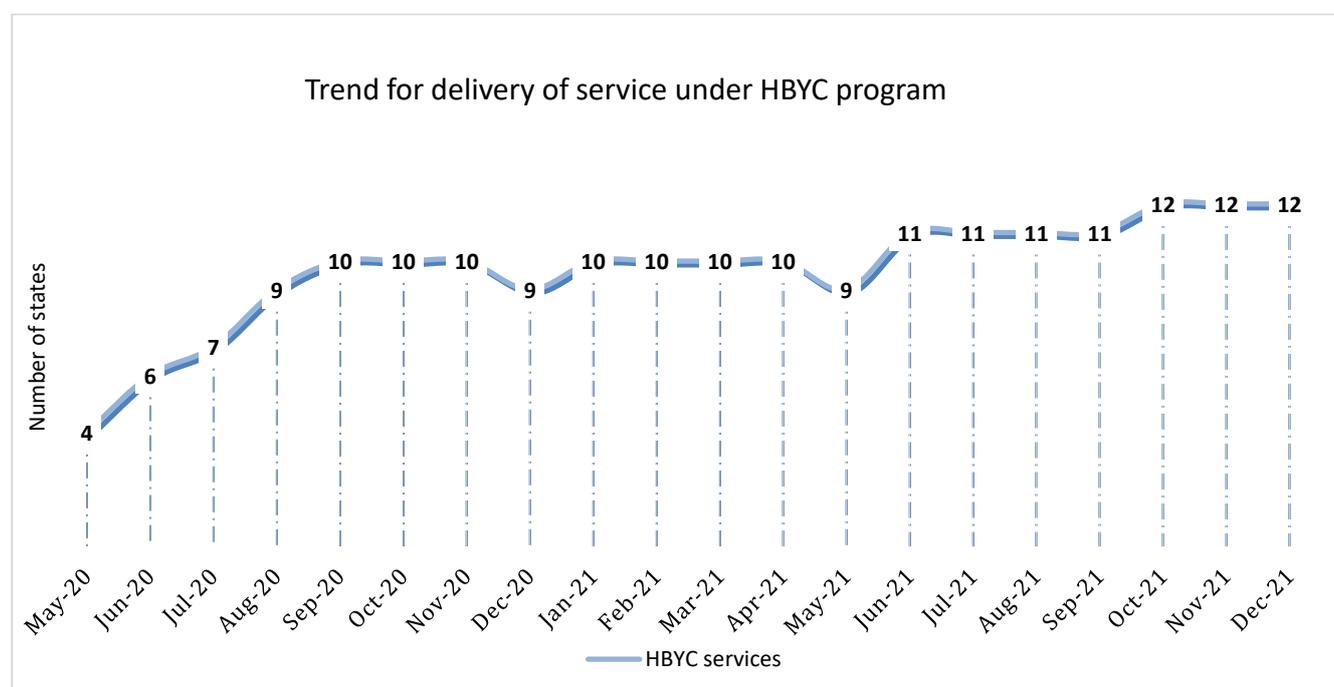


Figure 8: Trend for delivery of services under HBYC program

E. Iron and folic acid supplementation for children (5 to 69 months)

Iron folic acid supplementation (IFA) and deworming among children are two of the strategies to address anaemia in the country. Therefore, it becomes important to understand the effect of pandemic on IFA supplementation and deworming. Table 9 provides compilation of documents reviewed in this domain.

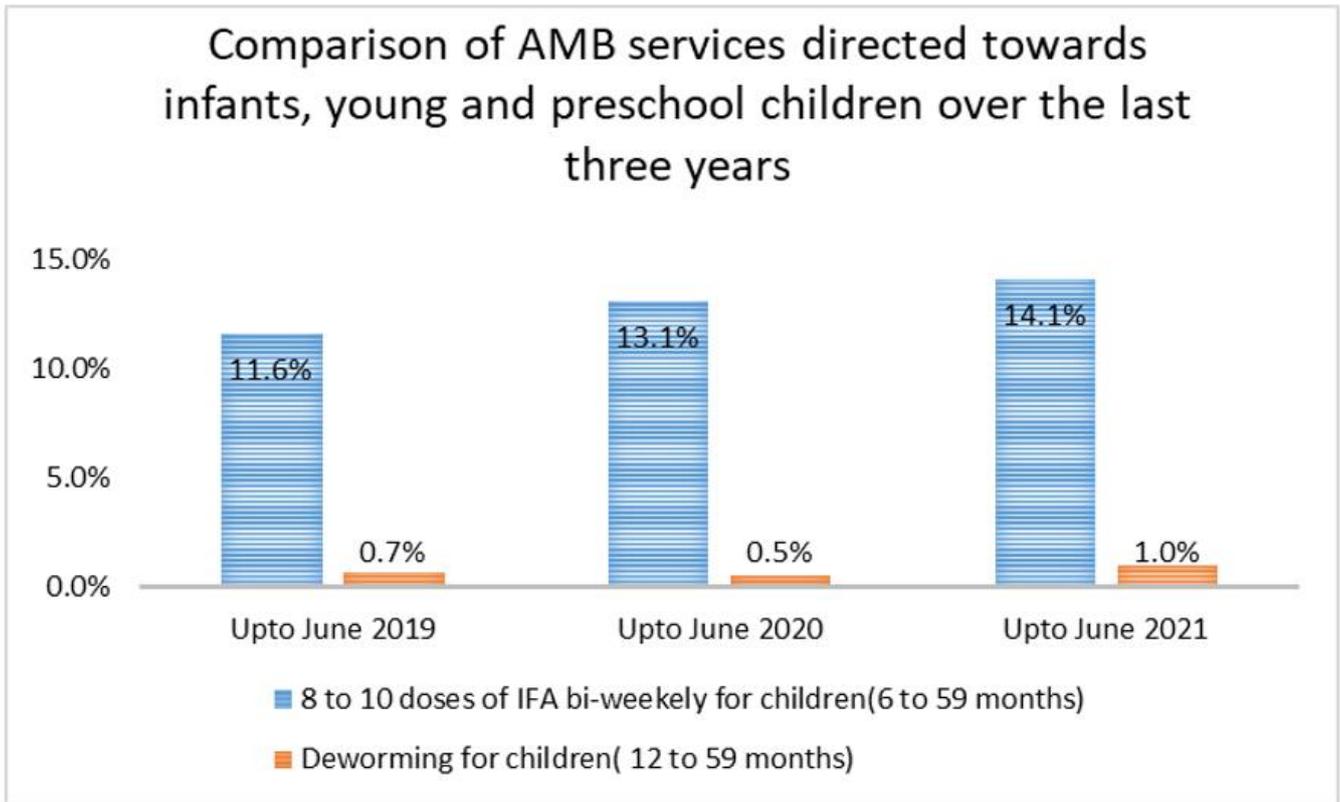
Table 9: Documents included in this review on provision of IFA supplementation for children amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
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³³ Assam, Bihar, Chhattisgarh, Gujrat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha, and West Bengal; not functional in Uttar Pradesh and no information from Andhra Pradesh

1.	Monitoring POSHAN Abhiyaan during the COVID-19 pandemic in Rajasthan-2020 (IDInsight, 2021)	Cohort, Rajasthan	Children, IFA distribution	May 2020 Only 7.0% mothers received IFA syrup for their children during lockdown Sample size: 1140	★★★
2.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children,2021)	Cross sectional, Delhi	Children, IFA distribution	November 2020 Only 22.0% children received IFA syrup 53.0% children received albendazole Sample: 232 U5 children	★★★
3.	Coverage of iron and folic acid supplementation in India: progress under the Anaemia Mukd Bharat strategy 2017–20 (Joe et al.,2022)	Narrative report, India	Children (6-59 months), IFA coverage	In 2019-20: lowest coverage among children aged 6-59 months (14.9%) since 2017	★★★
4.	Anaemia Mukd Bharat (accessed on 6.04.22)	Dashboard, India	Children, IFA distribution	Percentage of children receiving IFA supplementation over the last 3 years: marginal increase from 11.6% (2019) to 14.1% (2021)	NR

As documented in Table 10, a dashboard and 3 reports show that in 2020, nationally, about 14.9% children received IFA supplementation. During the same period, state level variations were evident and ranged from a coverage of 7.0% in Rajasthan [\(IDInsight, 2021\)](#) to 22.0% in a Delhi slum [\(Save The Children, 2021\)](#). Also, with respect to deworming services, 53.0% of children in Delhi received albendazole in November 2020 [\(Save The Children, 2021\)](#). Latest national data from AMB portal (Fig.9) for the last three years (June 2019 to June 2021) showed a very marginal increase in service provision of IFA and Deworming. About 14.1% of children received IFA supplementation as of June 2021 compared to 11.6% in June 2019. Also, the status of deworming of children (aged 12 to 59 months) was almost stagnant in all three years of comparison. The poor coverage of both these services needs immediate attention.



Data source: anemiamukt Bharat.in

Figure 9: Comparison of ABM program for infants and pre-school children for last three years

F. Vitamin A supplementation (VAS)

Vitamin A supplementation (VAS) is an essential programme to reduce micronutrient deficiency among pre-school children. Pre-pandemic data suggested that in 2018-19, 25 lakh children (less than 3 years old) should have received vitamin A dose but only 13 lakh (51.7%) of these children received the dose ([HMIS, accessed on 6.05.22](#)). Table 10 provides compilation of documents reviewed under this domain.

Table 10: Documents included in this review on VAS programme amidst the pandemic

No	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Palghar project spotlight, an ICDS system strengthening initiative: End of project evaluation (TATA Trusts, Palghar, 2020)	Serial cross sectional, Palghar Maharashtra	Children (12-23 months), VAS utilization	Children received biannual VAS Pre-COVID (2018): 83.3% During-COVID (2020): 76.7% (Intervention data, CI for pre-post comparison not available) Sample size:200	★★★

2.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Serial cross sectional, Gadchiroli (Maharashtra)	Children (12-23 months), VAS utilization	Children received biannual VAS (12 to 23 months) Pre-COVID (2019): 93.8% During-COVID (2021): 85.6% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
3.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children, 2021)	Cross sectional, Delhi	Children, VAS utilization	November 2020, 32.0% received VAS Sample: 232 U5 children	★★★
4.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional Chandrapur (Maharashtra)	Children, VAS utilization	Children received biannual VAS (12 to 23 months) Pre-COVID (2019): 75.0% During-COVID (2020): 86.5% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
5.	Innovation and adaptation (UNICEF, n.d.)	Newsletter, India	Children, VAS innovation	During pandemic FLWs enabled: Delivery of social distancing norms at the sites Chhattisgarh: auto dispensers to dispense Vit A syrup Madhya Pradesh: pour syrup into spoons carried by beneficiaries Uttar Pradesh: disposable spoons usage	NR

As documented in Table 10, 5 studies were reviewed under this domain and limited data was available to understand VAS services amidst the pandemic. In the first year of pandemic, children receiving VAS, ranged from 32.0% in Delhi slum ([Save The Children, 2021](#)) to 70.0-80.0% in various districts of Maharashtra (TATA Trusts

reports above). As compared to pre-pandemic time, uptake of VAS, had reduced (Palghar and Gadchiroli districts). This reduction may be attributed to the mobility restrictions imposed to contain the virus. There is paucity of data in public platform at national level on the coverage of VAS during pandemic. Commendable efforts at the state level were undertaken to adhere to the COVID appropriate service delivery while adapting to the pandemic situation. Various innovative methods like use of disposable spoon or auto dispensing devices were employed to aid the restoration of VAS services ([UNICEF, n.d.](#)).

G. Management of Severe Acute Malnutrition (SAM)

Severe Acute Malnutrition (SAM) leading to higher risk of mortality in children under five remains a critical public health challenge. This was further exacerbated by the COVID-19 pandemic as access to Nutrition Rehabilitation Centres got affected especially during the first wave due to some centres being repurposed for COVID treatment, staff allocated for COVID management and limited transportation available. Table 11 provides the compilation of documents reviewed to understand the impact of pandemic and continuity of this service.

Table 11: Documents included in this review on SAM management amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	A hidden cost: The pandemic's impact on nutrition (Accountability Initiative, 2020)	Narrative report, India	Children with SAM, Treatment at NRC	February-June 2020: Treatment at NRCs continued in all state (except Gujarat and Chhattisgarh)	★★★
2.	COVID-19 pandemic situation report, January-April 2021 (UNICEF, 2021)	Narrative report, India	Children with SAM, Management of SAM	January- February 2021: 63,614 admissions of children with SAM either in: facility or community-based program as compared to 39,596 admissions (Jan-Feb 2020)	★★★
3.	Strategic policy adaptations to mitigate the effect of COVID-19 on maternal and child health services, Rajasthan (IPE Global, 2021)	Qualitative study, Rajasthan	Children with SAM, identification of children with SAM	2020: Identification SAM children severely affected (24281 in 2019 reduced to 869 in 2020 – Udaipur)	★★
4.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross sectional, Chhattisgarh	Field functionaries, NRC services	May-June 2021: Referral of SAM children to NRCs: reported by only 4.0% respondents; 27.0% reported opening of nearest NRCs for SAM management and 29.0% reported conduction of screening	★★

				for SAM identification	
				Respondents: 14 DPOs, 30 CDPOs and 45 Lady Supervisors	
5.	Continuity of service tracking, UNICEF (Poshan Covid19.in)	Dashboard, India	CMAM, NRC	Dec 2021 NRCs were operational in most states during pandemic period. CMAM was operational in 3 states during May-July 2020 but increased to 11 states in Sept 2021. However, out of 14 states monitored, NRCs were functional in 13 States ³⁴ and CMAM was functional in 11 States. ³⁵	NR

As shown in Table 11, 1 dashboard and 4 documents were reviewed to understand the effect of COVID-19 on treatment of children with SAM. These children remain the most vulnerable population in need of focused and immediate attention due to higher risk of mortality. With the emergence of pandemic in 2020, identification of children with SAM got severely affected. This may be attributed to AWC closure and limited physical interaction. As of June 2020, treatment at Nutrition Rehabilitation Centres (NRCs) continued in all states except Gujarat and Chhattisgarh. However, in 2021 as the lockdown measures were relaxed, an increase with respect to admission of children with SAM was recorded nationally. In June 2021, opening of nearest NRCs and screening services for SAM identification was reported by only 27.0% and 29.0% respondents respectively in Chhattisgarh. In 22 districts of Jharkhand, only 31.7% of children with SAM received nutritional support from AWC. As shown in Figure 10, according to UNICEF’s continuity of service tracking, as of Dec 2021, NRCs were functional in 13 of the 14 UNICEF monitored States while and Community Based Management of Acute Malnutrition (CMAM) services were functional 11 States ([Poshan Covid19.in](https://poshan-covid19.in)).

³⁴ Assam, Bihar, Chhattisgarh, Gujrat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha, Uttar Pradesh and West Bengal; no information from Andhra Pradesh

³⁵ Assam, Bihar, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha, Uttar Pradesh and West Bengal; not operational in Gujarat and no information from Andhra Pradesh and Karnataka

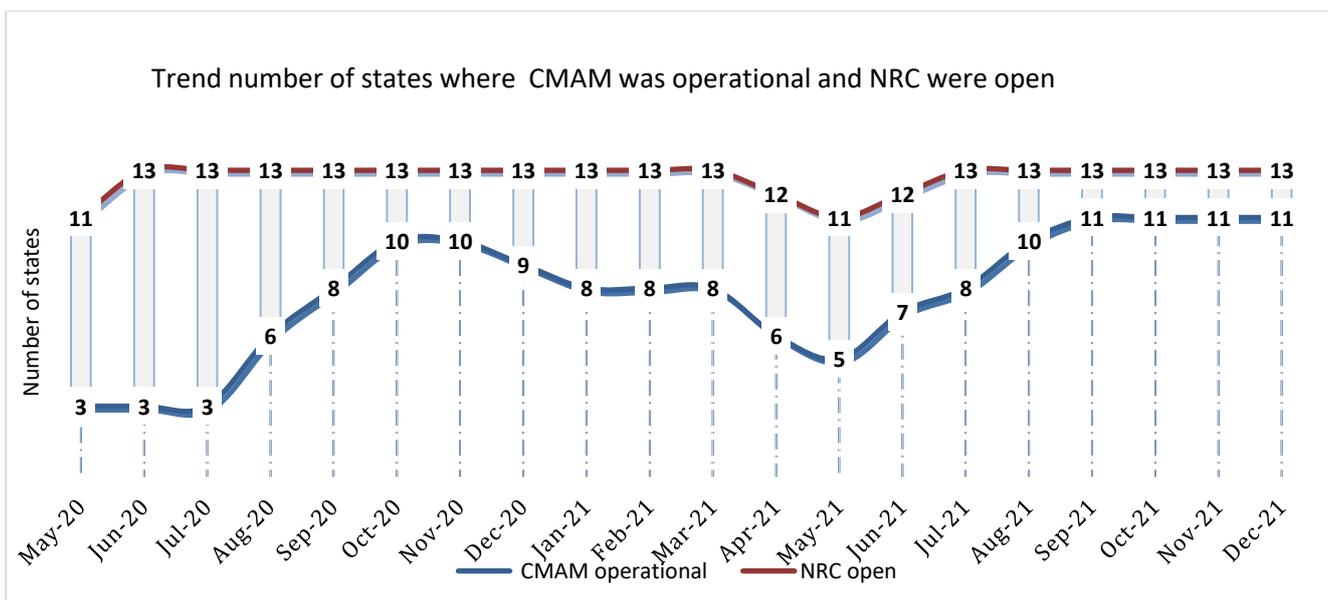


Figure 10: Trend for functioning of CMAM and NRC amidst the pandemic

H. Status of immunization services for children

Immunization is a key nutrition specific intervention essential for disease prevention. Despite, India being a principal producer and exporter of vaccines, it is still home to one-third of the world’s under- five children with no immunization ([Banerjee et al., 2021](#)). This may have been further worsened, by the emergence of pandemic induced discontinuity in the delivery and utilization of services. Table 12 provides compilation of documents reviewed under this domain.

Table 12: Documents included in this review to understand immunization services for children amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Rapid assessment social protection and relief measures: COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May 2020 (UNICEF, 2020)	Cross sectional, Andhra Pradesh	Children, Immunization coverage	April-May 2020 Routine immunization: functional in 48.0% Gram Panchayats Sample: 26 Gram Panchayats from 13 districts	★★
2.	Rights of Vulnerable Families and Children of India under COVID-19: Implications for effective response and mitigation strategies (Save The Children, 2020)	Cohort, 16 states and UTs ³⁶	Children, Immunization utilization	June 2020, Household that utilised immunization services; Overall- 42.0%; Rural- 49.0%; Urban- 34.0% Sample: 7239	★★★

³⁶ Assam, West Bengal, Bihar, Jharkhand, Odisha, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Himachal Pradesh, Andhra Pradesh, Telangana, Tamil Nadu, Jammu Kashmir and Delhi

3.	Palghar project spotlight, an ICDS system strengthening initiative: End of project evaluation (TATA Trusts, Palghar, 2020)	Serial cross sectional, Palghar Maharashtra	Children, Immunization utilization	Coverage of immunization service: Children: Pre-COVID (2018): 70.0% During- COVID (2020): 75.5% (Intervention data, CI for pre-post comparison not available) Sample size:200	★★★
4.	Childhood immunization s in India during the COVID-19 pandemic (Shet et al., 2021)	Narrative report, India	Children, Immunization services provision	During pandemic India- 11.0 % unvaccinated/ under-vaccinated children globally	★★★
5.	RMNCAH-N Services During COVID-19: A spotlight on India's policy responses to maintain and adapt essential health services(PATH, 2021)	Narrative report, India	Children, Immunization utilization	Children's immunization affected. 1 million fewer children received the third dose of the pentavalent vaccine in April 2020 (0.7 million) compared with 2019 (1.8 million)	★★★
6.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Serial cross sectional, Gadchiroli (Maharashtra)	Children, Immunization utilization	Pre-COVID (2019): Children below 3 years- 100 %; Children above 3 years- 96.7 %. During-COVID (2021); Children below 3 years- 72.9 %; Children above 3 years- 35.0 % (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
7.	Epidemic of undernutrition during COVID-19 pandemic (Parida et al., 2021)	Narrative report, Odisha	Children, Immunization provision	During lockdown: Vaccination services discontinued in containment zones	★★★
8.	Effect of COVID-19 on programs aimed at improving health and nutrition status of women and children in Rajasthan (Development Solutions Inc, 2021)	Qualitative study, Rajasthan	Children, Immunization coverage	March-May 2020: No immunization services Sample: 104 households, 40 frontline workers, 18 supervisors	★★
9.	Baseline study for vision healthy India project: fight against the silent	Cross sectional, Delhi	Children, Immunization coverage	November 2020: 76% children fully immunized	★★★

emergency in Delhi (Save The Children,2021)			Sample: 234 U5 children		
10.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur (Maharashtra)	Children, Immunization utilization	Pre-COVID (2019) Below 3 years: 99.6% Above 3 years: 96.3% During-COVID (2020) Below 3 years: 76.0% Above 3 years: 42.4% (Intervention data, CI for the pre-post comparison not available)	★★★
			Sample: 450		
11.	Impact of COVID-19 pandemic on childhood immunization in a tertiary health care centre (Khan et al., 2021)	Narrative report, Delhi	Children, Immunization coverage using data from Immunization Centre, HIMSR and HAHC Hospital, New Delhi	January-July 2019 and 2020: Drop in vaccination counts after pandemic – 76.52% ± 43.62% in April 2019 reduced to 16.95% ± 42.55% in April 2020; P < 0.001	★★★
12.	Evidence based response to early childhood development during the COVID-19 crisis (Dalberg, 2022)	Cross sectional, 11 states ³⁷	Children 0 to 2 years, Immunization utilization (HMIS data)	September 2020-February 2021: received all vaccinations, Urban (90.0 %); Rural (86.0 %)	★★★
			Sample size: 10112		

As presented in Table 12, twelve documents were reviewed to understand the impact of COVID-19 pandemic on immunization services. Following the substantial disruption of the delivery of essential health services, such as routine immunization across the country due to COVID-19 pandemic, it was predicted that 27 million children in India would miss out on DPT vaccine and other health services ([Shet et al., 2021](#)). Immunization services were suspended completely, especially during the initial phases of lockdown in Rajasthan ([Development Solutions Inc, 2021](#)). Immunization activities were functional in 48.0% of sampled Gram Panchayats in Andhra Pradesh ([UNICEF, 2020](#)). In April 2020, overall, only 42.0% of the vulnerable households utilised immunization services across India ([Khan et al., 2021](#)). Data from tertiary hospitals in Delhi reported changes in immunization service delivery in first year of pandemic. In these hospitals, a maximum drop (-87.0%) in immunization was seen initially, which improved gradually, and increased to 27.0% ([Khan et al., 2021](#)). Evidence also highlighted that as of November 2020, about 76.0% of children from urban slum settlements of Delhi were fully immunised ([Save The Children, 2021](#)). In the tribal districts of Gadchiroli and Chandrapur, Maharashtra, overall immunization coverage for children of various age groups witnessed a sharp reduction as compared to pre-COVID uptake ([TATA Trusts, Chandrapur, 2021](#), [TATA Trusts, Gadchiroli, 2021](#)). In the unlocking phases of the pandemic,

³⁷ Andhra Pradesh, Assam, Bihar, Haryana, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh

measures to restore immunization services were initiated as early as 1st wave ([MoHFW, 2020](#)) wherein, vaccination at health facilities were promoted. Limited number of studies show an initial dip in services, which slowly resumed, but there is paucity of data in public domain on coverage of immunization services at national level.

3.2.2 Nutrition specific services directed towards school age children and adolescent

Every child and adolescent have the right to adequate nutrition. Not only is a balanced diet at household level essential to ensure adequate nutrition but also services and practices that encourage adequate nutrition have a significant role. The pandemic has hampered the delivery of nutrition specific services and thus it would be critical to understand the exact status of these nutrition specific services so that appropriate interventions can be strengthened. Continuity of essential services like Mid-Day Meal (MDM)/ PM-POSHAN, IFA supplementation targeted towards school age children and adolescent are discussed in the following section.

A. Status of school Mid-Day Meal scheme (PM-POSHAN)

MDM (now known as PM-POSHAN) aims to provide nutritious supplementary meal to school going children and adolescents. This scheme underwent a major face-lift to adapt to the changing times of pandemic. While the modality for delivery of this scheme were transformed in the beginning of the pandemic, the implementation has been variable at the state level ([WFP, 2020](#)). Table 14 provides the compilation of documents reviewed under this domain.

Table 13: Documents included in this review on status of School Midday Meals/ PM-POSHAN amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Local food systems and COVID-19A glimpse on India's responses (FAO, 2020)	Narrative report, India	Children, door to door delivery	During pandemic: Raw material in lieu of MDM-door step-AWW	★★★
2.	COVID-19 and Its Impact on MDM Program in India (Goutam,2020)	Narrative report, India	Children, Modality of MDM distribution	Different modalities were adopted by different states to distribute mid-day meals. Government and NGOs worked together for distribution	★★★
3.	School meals tracking: State Government response to coronavirus (WFP,2020)	Narrative report, India	Children, Modality of MDM distribution	As of May 2020 18 states ³⁸ : MDM functional	★★★

³⁸ UT of Delhi, Andhra Pradesh, Assam, Chhattisgarh, Karnataka, Maharashtra, West Bengal, Odisha, Gujarat, Jammu & Kashmir, Jharkhand, Meghalaya, Mizoram, Bihar, Nagaland, Uttarakhand, UT of Chandigarh, UT of Ladakh

				9 states ³⁹ : dry rations 2 states ⁴⁰ : Food safety allowance 7 states ⁴¹ : both	
4.	Rapid assessment social protection and relief measures COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF,2020)	Cross sectional, Andhra Pradesh	Children, availability of MDM	April-May 2020: MDM was functional in 76.0% Gram Panchayat 90.0 % were providing dry ration Sample: 26 Gram Panchayats from 13 districts	★★
5.	The State of India's Poor: Volume 1 April – June 2020 Social Group: Dalit (COLLECT: Community-led Local Entitlements and Claims Tracker,2020)	Cross sectional, 39 districts, 10 states ⁴²	Schedule Caste Children, provision of MDM	April-June 2020: No dry 47% Schedule Caste hamlets did not receive dry ration in lieu of MDM. Sample: 227 habitations from 39 districts	★★
6.	State of India's Poor: Volume 1 April-June 2020 Social Group: Women and Children (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020)	Cross sectional, 476 urban and rural locations across 57 districts from 11 states in India.	Children, access to MDM	April-June 2020: Majority of children: no access dry ration (distributed in lieu of MDM) 47.0 % of locations: no dry ration received	★★
7.	Learning in times of lockdown: how COVID-19 is affecting education and food security in India (Alvi et al.,2020)	Narrative report, India	Children, MDM delivery	During pandemic: Kerala, Telangana, Karnataka and Andhra Pradesh delivered meals/dry ration to home	★★★
8.	The State of India's Poor: Volume 1 April-June 2020 Social Group: Muslim community (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020)	Cross sectional, 53 urban and rural locations across 21 districts from	Children, minorities, access to MDM	April-June 2020: 66.0% to 71.0% habitations with predominantly minority communities did not receive any rations in	★★

³⁹ Andhra Pradesh, Assam, Chhattisgarh, Karnataka, Maharashtra, West Bengal, Odisha, Nagaland, UT of Ladakh

⁴⁰ Bihar, UT of Chandigarh

⁴¹ UT of Delhi, Gujarat, UT of Jammu and Kashmir, Jharkhand, Meghalaya, Mizoram, Uttarakhand

⁴² Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh

		4 states in India.		lieu of MDM during lockdown	
9.	School Meals in India – Tracking State Government Response to COVID-19 January-March 2021 (WFP, 2021)	Narrative report, India	Children, Modality of MDM distribution	January-March 2021: MDM functional in all states except Telangana 7 states ⁴³ provision of cooked meal 16 states ⁴⁴ - distribution of food grain and other item 8 states ⁴⁵ - distribution of dry ration and cooking cost.	★ ★ ★
10.	Rights of Vulnerable Families and Children of India under COVID-19: Implications for effective response and mitigation strategies (Save The Children, 2020)	Cohort, 16 states and UTs ⁴⁶	Children, access to MDM	June 2020: No MDM received: 39.0% children MDM received at doorstep or by visiting school: 35.0% Sample: 7239	★ ★ ★
11.	Impact of COVID-19 on food security: Insights from Telangana, India (Ravula et al., 2021)	Qualitative, Telangana	Children (6-15 years), access to MDM	July August 2020: Adolescents and school age children lost their nutritious meals	★
12.	School meals in India- Tracking state government response to COVID-19 April- June 2021 (WFP, 2021)	Narrative report, India	Children, Modality of MDM distribution	Functional in 35 of 36 states and union territories except Telangana. 19 states and UTs ⁴⁷ distributed dry rations and other food items 16 states and UTs ⁴⁸ distributed others provided dry rations	★ ★

⁴³ Andhra Pradesh, Arunachal Pradesh, Assam, Punjab, Tripura, Uttar Pradesh and Jammu & Kashmir

⁴⁴ Chhattisgarh, Goa, Jharkhand Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Rajasthan, Sikkim, Tamil Nadu, West Bengal, Chandigarh, Dadra and Nagar Haveli and Daman and Diu, Delhi and Lakshadweep

⁴⁵ Bihar, Gujarat, Haryana Himachal Pradesh, Nagaland Odisha, Andaman and Nicobar and Puducherry

⁴⁶ Assam, West Bengal, Bihar, Jharkhand, Odisha, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Himachal Pradesh, Andhra Pradesh, Telangana, Tamil Nadu, Jammu Kashmir and Delhi

⁴⁷ Andhra Pradesh, Assam, Chhattisgarh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Rajasthan Sikkim, Tamil Nadu, Tripura West Bengal, Andaman and Nicobar Islands, Chandigarh Dadra and Nagar Haveli and Daman and Diu, Delhi and Lakshadweep

⁴⁸ Arunachal Pradesh, Bihar, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Meghalaya, Nagaland, Odisha, Punjab, Uttar Pradesh, Uttarakhand, Jammu & Kashmir, Ladakh and Puducherry

				with cooking cost (through direct benefit transfer) as food security allowance	
13.	Analysing the Impact of COVID on Mid-Day Meal Scheme (Socialprotection.org, 2021)	Qualitative study, Patiala (Punjab)	MDM stakeholders, Modality of MDM	Disruption of the regular functioning of MDM, Doorstep Delivery and transferring cooking cost to beneficiaries.	★★★
14.	SCHOOL survey: report on education (ruralindiaonline.org, 2021)	Cross sectional, 15 states ⁴⁹	Children, Access to MDM	August 2021 Majority beneficiaries received some form of MDM, rural (85.0%)>urban (80.0%) Sample: 1,362 households	★★★
15.	Mid-Day Meals during COVID-19 Pandemic: A Study of Three Districts of Gujarat (Bulsari et al., 2022)	Cross sectional, Gujrat	Children, Modality of MDM distribution	January-February 2021: 82.3% supplied food grains, 12.0% transferred money to students' bank accounts.5.7 – both Sample size: 138 children	★★★
16.	Effect of COVID-19 pandemic on Food systems and determinants of resilience in indigenous communities of Jharkhand state, India: A serial cross-sectional study (Ghosh-Jerath et al., 2022)	Serial cross sectional, Jharkhand	Tribal children, access to MDM	May-June 2020 and September-October 2020: Santhal tribes: 14.0% and Munda tribes: 3.0% HHs received additional food in the form of dry rations (like cereals and pulses) through MDM, discontinued in unlock phase ($p < 0.001$) Sample size: 150 tribal households	★★★

⁴⁹ Assam, Bihar, Chandigarh, Delhi, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal.

As presented in Table 14, 16 reports were reviewed to understand the impact of the pandemic on Mid-Day Meals (MDM) scheme. Food security became a concern for children, as schools were shut down to contain the virus transmission. It affected one of the most important social safety scheme-MDM. In the initial period of lockdown (May 2020), only 18 states were providing dry ration or food safety allowance or a combination of both, and no information was available from 21 states⁵⁰ ([WFP, 2020](#)), however, by Jan-March 2021, MDM was functional in one form or another in 35 of 36 states and UTs with Telangana being the only state where MDM was not functional ([WFP, 2021](#)). Further in April 2021, MDM was found to be functional in nearly all states and UTs and since the elementary classes were closed, MDM was provided as Food Security Allowance (FSA), consisting of dry ration only or a combination of dry ration plus cooking cost. During this period, it has been found that only 1 state (Telangana) was not providing MDM in any form ([WFP, Apr-June, 2021](#)). Varying accounts of access have been reported in different studies. One school survey report from 15 states showed 85% eligible children in rural India and 80% from urban area had accessed MDM in some form ([ruralindiaonline.org, 2021](#)). However, another study on MDM coverage in 16 states shows that midday meals were not available to 39.0% of children from 16 states ([Save The Children, 2020](#)). Vulnerable sections of society also faced difficulties with respect to accessibility of MDM. About 66-71% of households in minority community dominated hamlets (from 4 states⁵¹) ([COLLECT: Community-led Local Entitlements and Claims Tracker,2020](#)) and 63.0-67.0% Schedule Caste dominated hamlets (from 10 states⁵²) did not receive any rations in lieu of MDM across India ([COLLECT: Community-led Local Entitlements and Claims Tracker, 2020](#)). Similarly among denotified and nomadic communities, households in 68.0-73.0% hamlets did not receive any ration in April-June 2020 in lieu of MDM from Anganwadi centres ([COLLECT: Sate of India's Poor: Denotified and Nomadic tribes](#)). In the rural hinterlands of Jharkhand, only 3-14% tribal households reported receiving dry rations (cereals and pulses) during May-June 2020 ([Ghosh-Jerath et al., 2022](#)) which was significantly lower than what they received in pre-pandemic. Logistic issues and fund approvals also came in way of MDM distribution during the pandemic; like in north Delhi municipal corporation area, food grain were neither lifted nor distributed in 721 schools in 2nd, 3rd and 4th quarters during 2020-21 ([Gol PAB minutes, 27.08.2021](#)).

Food basket varied from only grains to a more nutritious combination consisting of grains, pulses, oil, potatoes, eggs, salt, condiments among other items across different states. Thus, throughout the pandemic, though the alternate modality of distribution was initiated quite early on, but the ground level implementation was varied across different regions.

B. Status of IFA supplementation and deworming

Iron deficiency anaemia is a matter of concern among school going children and adolescent population which might hamper their cognitive development, physical efficiency and learning. It is important to understand the effect of pandemic with respect to continuity of IFA supplementation and deworming program among school going children and adolescents. Table 15 provides the compilation of documents reviewed under this domain.

⁵⁰ UT of Andaman and Nicobar, UT of Chandigarh, UT of Ladakh, UT of Puducherry, Arunachal Pradesh, UT of Dadra & Nagar Haveli and Daman & Diu, UT of Lakshadweep, Manipur, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Haryana, Himachal Pradesh, Kerala, Punjab, Madhya Pradesh, Uttar Pradesh, Uttarakhand, Goa

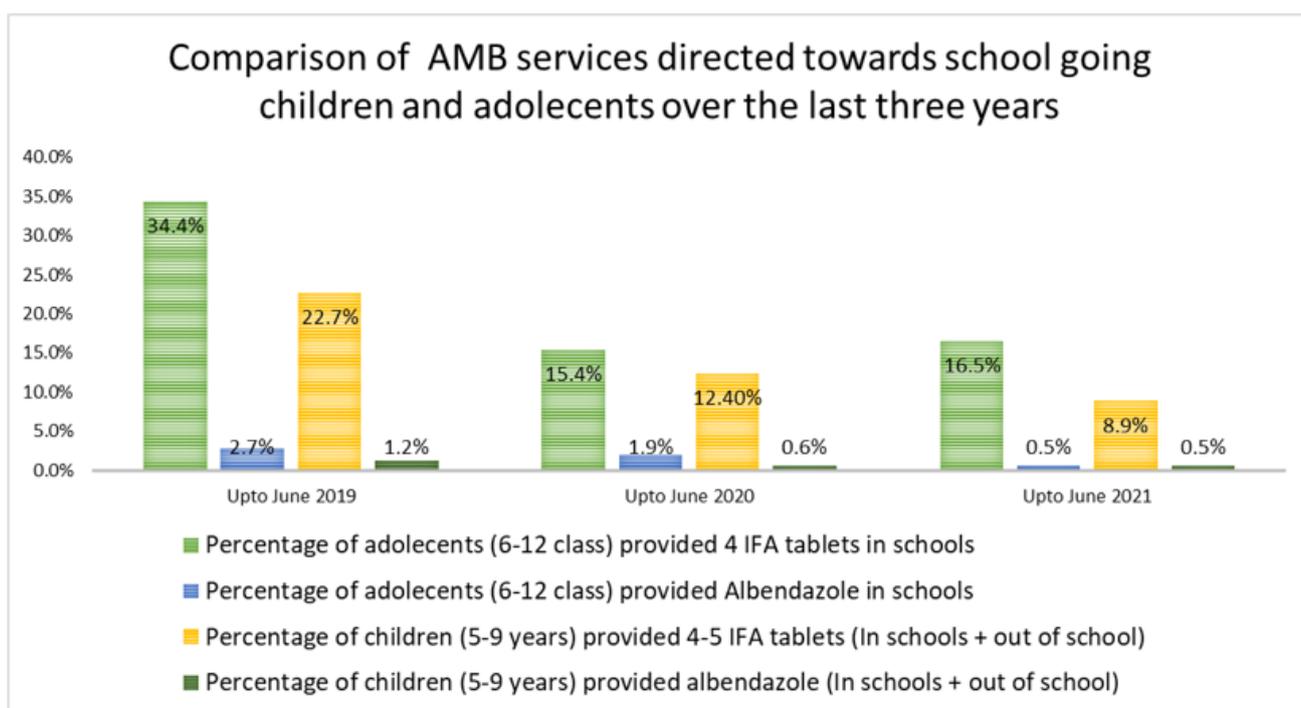
⁵¹ Bihar Gujarat Jharkhand Uttar Pradesh

⁵² Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh

Table 14: Documents included in this review on provision of IFA tablet for school children and adolescent amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Rapid assessment social protection and relief measures COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF,2020)	Cross sectional, Andhra Pradesh	Adolescents IFA, calcium provision	April May 2020: Adolescent girls: 72.0% of Gram Panchayats (GPs) provided IFA Sample: 26 Gram Panchayats from 13 districts	★★
2.	Impact of COVID-19 pandemic on adolescent health in India (Kumar et al., 2020)	Narrative report, India	Adolescent, IFA supplementation services	During lockdown: IFA supplementation at AWC- affected	★★★
3.	A hidden cost: The pandemic's impact on nutrition (Accountability Initiative, 2020)	Narrative report, India	Children, IFA coverage	February-June 2020 IFA in schools, tablet provision witnessed a decline; Similar trends for those whose mothers received IFA from AWC and for out-of-school children	★★★
4.	COVID-19 Pandemic Situation Report January-April 2021 (UNICEF,2021)	Narrative report, India	Adolescent, IFA received	February 2021: 21.0% of adolescent boys and girls received IFA	★★★
5.	Anaemia Mukt Bharat (accessed on 6.04.22)	Dashboard, India	Adolescent, Children, IFA distribution	IFA distribution for adolescent: June 2019-34.4% June 2020- 15.4% June 2021-16.5% IFA distribution for children: June 2019-22.7% June 2020- 12.4% June 2021-8.9%	NR
6.	COVID-19 disrupted provision and utilization of health and nutrition services in Uttar Pradesh, India: Insights from service providers, household phone surveys, and administrative data (Nyugen et al.,2021)	Cohort, Uttar Pradesh	Adolescent, IFA provision	December 2019-July 2020 FLWs providing IFA improved by 46.2% from April 2020 (3.5%) to July 2020 (49.7%) (p value <0.001)	★★

As presented in Table 15, a dashboard and 5 reports were reviewed to understand the continuity of IFA supplementation program directed towards children and adolescents during pandemic. As shown in figure 11, Anaemia Mukt Bharat dashboard shows a decline in IFA supplementation coverage for adolescents in June 2020 compared to June 2019, and a slight improvement in June 2021, however it had not reached pre-pandemic levels. The distributions were hampered primarily due to long school closures. Small studies show varied coverage. In Andhra Pradesh, 72.0% GP reported providing IFA to adolescent girls (UNICEF,2020). Another study from Uttar Pradesh showed IFA supplementation for adolescent had significantly improved from 3.5% April 2020 to 49.7% July 2020 (Nyugen et al., 2021). The status of albendazole tablet distribution as part of deworming services for both age groups has been decreasing consistently in all three years of comparison (AMB Dashboard).



Data source: [AMB dashboard](#)

Figure 11: Comparison of AMB program for school going children and adolescents over the last three years

3.2.3 Nutrition specific services directed towards pregnant and lactating women

Pregnancy and lactation are two nutritionally demanding phases in a woman's life. These additional requirements need targeted intervention to ensure positive birth outcome. The following section covers diet and nutrient supplementation services targeted towards pregnant and lactating women.

A. IFA, calcium supplementation and deworming during pregnancy

The National guideline for maternal nutrition provides for one IFA tablet with 60 mg of elemental iron and 500 microgram of folic acid every day for 180 days, 1g/day of calcium for 182 days both during pregnancy and lactation for prevention of anaemia and pre-eclampsia respectively. Additionally, a single dose of 400 mg of albendazole is recommended during pregnancy for deworming and anaemia prevention (NHM, n.d.). Effect of the pandemic on these services have been varied. Table 15 provides a compilation of documents reviewed under this domain.

Table 15: Documents included in this review on provision of micronutrient supplementation and deworming for pregnant and lactating women amidst the pandemic

No	Title (Author/organisation, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Rights of Vulnerable Families and Children of India under COVID-19: Implications for effective response and mitigation strategies (Save The Children, 2020)	Cohort, 16 states and UTs ⁵³	Pregnant and lactating women, IFA, calcium utilization	June 2020, household that utilised IFA or calcium supplementation during ANC for pregnant and lactating women Overall- 21.0% Rural- 23.0% Urban- 19.0% Sample size: 7239	★★★
2.	Rapid assessment social protection and relief measures COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF, 2020)	Cross sectional, Andhra Pradesh	Pregnant women, IFA provision	April-May 2020: 88.0 % GPs provide IFA to pregnant women 84.0 % GPs provide calcium to pregnant women Sample size: 26 Gram Panchayats from 13 districts	★★
3.	COVID-19 pandemic situation report, January-April 2021(UNICEF, 2021)	Narrative report, India	Pregnant women, IFA received	January-April 2021: Pregnant women received IFA supplements- April 2020: 58.0% February 2020: 98.0% February 2021: 90.0%	★★★
4.	Continuity of antenatal care services in Chhattisgarh during COVID19 (Singh et al., 2021)	Cross sectional, Chhattisgarh	Pregnant women, IFA received	June-July 2020: 89.0% of pregnant women received the IFA tablet during ANC visit	★★
5.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross sectional, Chhattisgarh	Respondents Field functionaries, IFA, calcium, albendazole distribution	May-June 2021, 63.0% respondents reported distributing albendazole pregnant women	★★

⁵³ Assam, West Bengal, Bihar, Jharkhand, Odisha, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Himachal Pradesh, Andhra Pradesh, Telangana, Tamil Nadu, Jammu Kashmir and Delhi

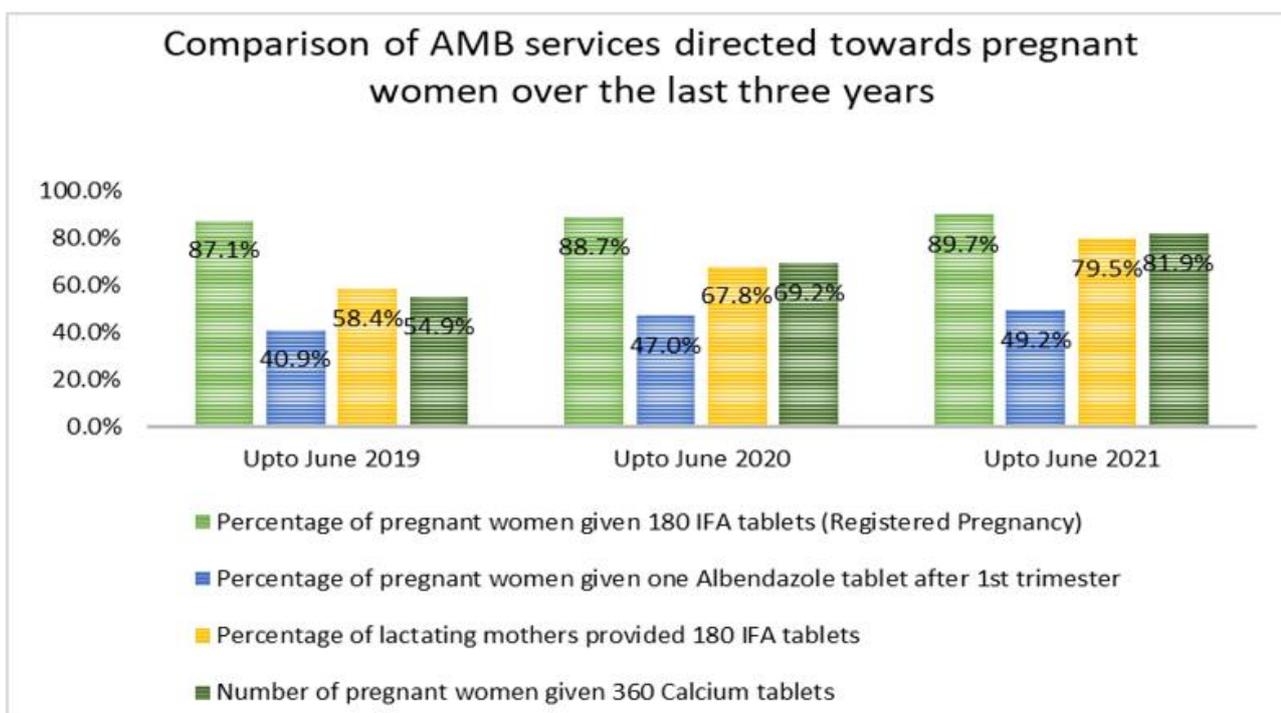
				Calcium tablets distribution reported by 72.0% IFA by 93.0%	
6.	Monitoring POSHAN Abhiyaan during the COVID-19 pandemic in Rajasthan – 2020 (IdInsight, 2021)	Cohort study, 7 districts of Rajasthan	Pregnant women, IFA received/consumed	January 2020 (Round-1) and May 2020 (Round-2): IFA received January 2020: 22.0% May 2020: 10.0% IFA consumed January 2020: 52.0% May 2020: 26.0% Sample size: 1140 respondents	★★★
7.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children, 2021)	Cross sectional, Delhi	Pregnant and lactating women, IFA, calcium, albendazole consumption	November 2020: 100 or more IFA tablet consumed- Lactating women-53.0% pregnant women-28.0% 180 calcium tablets consumed pregnant women-17.0% lactation women- 7.0% deworming-pregnant women-11.0% Sample size: 23 pregnant women and 15 lactating women	★★★
8.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur (Maharashtra)	Pregnant and lactating women, IFA, calcium consumption	IFA- Pregnant women: Pre-COVID (2019): 73.7% During-COVID (2020): 92.2% IFA-Lactating women: Pre-COVID (2019): 57.7% During-COVID (2020): 88.3% Calcium-Pregnant women: Pre-COVID (2019): 73.6% During-COVID (2020): 92.6%	★★★

				<p>Calcium-Lactating women: Pre-COVID (2019): 56.8% During-COVID (2020): 90.6% (Intervention data, CI for the pre-post comparison not available) Sample: 450</p>	
9.	<p>ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)</p>	<p>Serial cross sectional, Gadchiroli (Maharashtra)</p>	<p>Pregnant and lactating women, IFA, calcium consumption</p>	<p>IFA-Pregnant women: Pre-COVID (2019): 82.9% During-COVID (2021): 90.5%</p> <p>IFA-Lactating women: Pre-COVID (2019): 73.4% During-COVID (2021): 90.9%</p> <p>Calcium- Pregnant women: Pre-COVID (2019): 82.7% During-COVID (2021): 92.5%</p> <p>Calcium-Lactating women: Pre-COVID (2019): 73.2% During-COVID (2021): 92.9% (Intervention data, CI for the pre-post comparison not available) Sample: 450</p>	<p>★★★</p>
10.	<p>Anaemia Mukht Bharat (accessed on 6.04.22)</p>	<p>Dashboard</p>	<p>IFA</p>	<p>IFA supplementation- Pregnant women: June 2019-87.1% June 2020-88.7% June 2021-89.7%</p> <p>IFA supplementation- Lactating women: June 2019-40.9% June 2020-47.0%</p>	<p>NR</p>

				June 2021-49.2%	
				Albendazole-Pregnant women	
				June 2019-40.9%	
				June 2020-47.0%	
				June 2021-49.2%	
				Calcium supplementation - Pregnant women	
				June 2019-54.9%	
				June 2020-69.2%	
				June 2021-81.9%	
11.	Evidence based response to early childhood development during the COVID-19 crisis (Dalberg, 2022)	Cross sectional, 11 states ⁵⁴	Pregnant and lactating women, IFA consumption	September 2020-February 2021 IFA consumption: 80.0% of pregnant, lactating women, (compared to 85.0% pre-pandemic, HMIS)	★ ★ ★
				Sample size: 10112	

As presented in Table 15, a dashboard and 10 reports were assessed to understand the impact of COVID-19 on continuity of maternal nutritional services. During the initial phase of the pandemic in 2020, mobility restrictions were imposed, the workforce repurposed for COVID management and community-based services like distribution of micronutrient supplement was halted. State level variation was recorded. A cross sectional study across 11 states showed 80.0% pregnant and lactating women received IFA compared to pre-pandemic level of 85.0% [\(Dalberg, 2022\)](#). In Chhattisgarh, 93.0% field functionaries reported distributing IFA, 72.0% and 63.0% had distributed calcium and albendazole respectively [\(UNICEF, 2021\)](#). In Delhi, about 53.0% lactating women, and 28.0% of pregnant women consumed calcium tablets [\(Save The Children, 2021\)](#). In tribal districts of Maharashtra (2020-21) uptake were above 90.0% for IFA and calcium supplements [\(TATA Trusts, Gadchiroli, 2021, TATA Trust, Chandrapur, 2021\)](#). However, this could be attributed to project interventions from TATA Trusts in these districts. About 88.0% and 84.0% Gram Panchayats in Andhra Pradesh provided IFA and calcium supplements respectively to pregnant women during April-May 2020 [\(UNICEF, 2020\)](#). National level data from AMB portal showed that IFA and albendazole distribution among pregnant women was steady in last three years. However, percentage of lactating women receiving IFA and pregnant women receiving calcium had increased significantly in the last three years despite the effect of pandemic [\(AMB Dashboard\)](#).

⁵⁴ Assam, Bihar, Odisha, Uttar Pradesh, Madhya Pradesh, Haryana, Punjab, Maharashtra, Rajasthan, Andhra Pradesh, Tamil Nadu,



Data source: AMB dashboard

Figure 12: Comparison of AMB program for pregnant and lactating women over the last three years

B. Take Home Rations (THR) for pregnant and lactating women

Provision of THR addresses the nutrition gap that exists in daily diets of women enrolled in ICDS during the pregnancy and lactation period. Table 16 provides the compilation of documents reviewed to understand how the pandemic has impacted the provision of this service.

Table 16: Documents included in this review on provision of THR for pregnant and lactating women amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Rapid assessment social protection and relief measures COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF, 2020)	Cross sectional, Andhra Pradesh	Pregnant women, THR provision	April-May 2020: THR for pregnant women provided in 80.0% of Gram Panchayats Sample size: 26 Gram Panchayats from 13 districts	★★
2.	State of India's Poor: Volume 1 April-June 2020 Social Group: Women and Children (COLLECT: Community-led)	Cross sectional, 57 districts from 11 states ⁵⁵	Pregnant and lactating women,	April-June 2020: Pregnant and lactating women received THR- April and May 2020- 38.0% location	★★

⁵⁵ Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal

	Local Entitlements and Claims Tracker, 2020)		THR received	June 2020- 39.0% location Sample: 476 urban and rural locations across 57 districts	
3.	The State of India's Poor: Volume 1 April – June 2020 Social Group: Dalit (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020)	Cross sectional, 39 districts, 10 states ⁵⁶	Pregnant and lactating women, Schedule Caste, THR received	April-June 2020: In hamlets with predominant Schedule Caste population, 35.0% to 40.0% of Anganwadi sites did not receive any extra nutrition for pregnant and lactating women Sample: 227 urban and rural locations across 39 districts	★★
4.	The State of India's Poor: Volume 1 April-June 2020 Social Group: Muslim Community (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020)	Cross sectional, 4 states ⁵⁷	Pregnant and lactating women, minority community, THR provision	April-June 2020: 56.0% locations- no THR- for pregnant and lactating mothers in minority dominated hamlets. Sample: 53 urban and rural locations across 21 districts	★★
5.	Palghar project spotlight, an ICDS system strengthening initiative: End of project evaluation (TATA Trusts, Palghar, 2020)	Serial cross sectional, Palghar Maharashtra	Pregnant women, THR utilization	Overall utilization of SNP service Pre-COVID (2019): 91.5% During-COVID (2020): 94.5% (Intervention data, CI for pre-post comparison not available) Sample size:200	★★★
6.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Cross sectional, Gadchiroli (Maharashtra)	Pregnant and lactating women, THR utilization	Utilization of SNP services Pre-COVID (2019): Pregnant women: 81.0% Lactating mother: 84.8% During-COVID (2021): Pregnant women: 24.2% Lactating mother:24.9% (Intervention data, CI for the pre-post comparison not available)	★★★

⁵⁶ Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh

⁵⁷ Bihar Gujarat Jharkhand Uttar Pradesh

				Sample: 450	
7.	Continuity of antenatal care services in Chhattisgarh during COVID19 (Singh et al., 2021)	Cross sectional, 8 districts of Chhattisgarh ⁵⁸	Pregnant women, THR received	May 2020: 57.0% pregnant women received ration from AWC Sample size: 425	★★
8.	Effect of COVID-19 on programs aimed at improving health and nutrition status of women and children in Rajasthan (Development Solutions Inc, 2021)	Qualitative study, Rajasthan	Pregnant women, Doorstep delivery of THR	April – June 2020, AWWs delivered THR at doorsteps Post-lockdown (June 2020)- distribution from AWC	★★
9.	Monitoring POSHAN Abhiyaan during the COVID-19 pandemic in Rajasthan – 2020 (Idinsight, 2021)	Cohort, 7 districts of Rajasthan ⁵⁹	Pregnant women, THR distribution	January and May 2020, the distribution of THR in Rajasthan decreased by about 8.0% between baseline and endline Sample size: 1140	★★★
10.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross sectional, Chhattisgarh	Respondents: Field functionaries, THR provision	May-June 2021 State level initiative: 78.0% respondents reported that pregnant women received THR 22.0% of respondents reported women received food entitlement	★★
11.	Assessing impact of the COVID-19 pandemic on the socio-economic situation of vulnerable populations through community-based monitoring (UNICEF, 2021)	Cohort, 7 states ⁶⁰	Pregnant women, THR received	June-July 2020: pregnant women received THR Before lockdown Rural- 55.0%, urban- 32.0% After lockdown Rural- 48.0%, urban- 26.0% Lactating women received THR Before lockdown- 68% (Rural) After lockdown- 48% (Rural) Sample: 546 (rural), 355(urban)	★★★

⁵⁸ Jashpur, Koriya, Surguja, Surajpur, Kanker, Janjgir Champa, Gaurella Pendra Marwahi and Bilaspur

⁵⁹ Ajmer, Baran, Bhilwara, Bikaner, Jhalawar, Jodhpur, and Tonk

⁶⁰ Uttar Pradesh, Tamil Nadu, Rajasthan, Maharashtra, Andhra Pradesh, Telangana, Gujarat

12.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra) Endline report on key indicators (TATA Trusts, Chandrapur, 2021)	Serial cross sectional, Chandrapur (Maharashtra)	Pregnant and lactating women, Utilization of THR	Utilization of THR Pre-COVID (2019): Pregnant women: 92.9% Lactating mother: 92.5% During-COVID (2020): Pregnant women: 32.4% Lactating mother: 47.9% (Intervention data, CI for the pre-post comparison not available)	★★★★
				Sample: 450	
13.	Effect of COVID-19 pandemic on food systems and determinants of resilience in indigenous communities of Jharkhand state, India: A serial cross-sectional study (Ghosh-Jerath et al., 2022)	Serial cross sectional, Jharkhand	Tribal communities, THR received	SNP-doorstep as THR- 20.0% HHs in Santhal and Munda tribal communities	★★★★
				Sample size: 150 households	
14.	Evidence based response to early childhood development during the COVID-19 crisis (Dalberg, 2022)	Cross sectional, 11 states ⁶¹	Pregnant women, Challenges in receiving THR	September 2020-February 2021 (11 states): 43.0% Household with pregnant women reported challenges in receiving food from AWC	★★★★
				Sample size: 10112	
15.	Continuity of service tracking, UNICEF (PoshanCovid19.in)	Dashboard, India	Pregnant and lactating women, THR provision	Dec 2021 Out of 14 states monitored, THR for pregnant and lactating women available in 13 States. ⁶²	NR

As presented in Table 16, a dashboard and 14 documents were reviewed to understand the impact of COVID-19 on this domain. Figure 13 shows that the supply of THR was reported from 13 of the 14 UNICEF monitored States, the supplies were disrupted in Jharkhand and West Bengal ([PoshanCovid19.in](#)). However, there is paucity of data on coverage of beneficiaries. A study from 11 states shows 43.0% pregnant women faced challenges in accessing THR ([Dalberg, 2022](#)). One study in Chhattisgarh with ICDS functionaries reported that about 40.0% of pregnant women were provided THR in May 2020, which then improved to 78.0% after the second wave ([Singh et al., 2021](#)). Another study from Andhra Pradesh showed THR being provided to pregnant and lactating women in 80% Gram Panchayats ([UNICEF, 2020](#)). In the second year of pandemic (2021), the provision varied from 20.0% in tribal communities of Jharkhand ([Ghosh-Jerath et al., 2022](#)) to more than 90.0% in tribal communities of Maharashtra during the same time ([TATA Trusts, Chandrapur, 2021](#)) ([TATA Trusts, Gadchiroli, 2021](#)) Coverage

⁶¹ Assam, Bihar, Odisha, Uttar Pradesh, Madhya Pradesh, Haryana, Punjab, Maharashtra, Rajasthan, Andhra Pradesh, Tamil Nadu,

⁶² Assam, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha and Uttar Pradesh; supplies were disrupted in Jharkhand and West Bengal between Feb-Dec 2021

of SNP among pregnant women belonging to socially vulnerable localities was low. People from 56% hamlets of minority community received SNP benefits ([COLLECT: Community-led Local Entitlements and Claims Tracker, 2020](#)), while 35.0% to 40.0% of Anganwadi sites in hamlets predominantly inhabited by the scheduled castes did not receive any extra nutrition for pregnant and lactating women ([COLLECT: Community-led Local Entitlements and Claims Tracker, 2020](#)). State level variation in modality of distribution was also observed. In Bihar, DBT was provided in lieu of THR and doorstep delivery of SNP was carried out in Jharkhand. Thus, while THR supply continued the access has not been uniform across states and across different social groups.

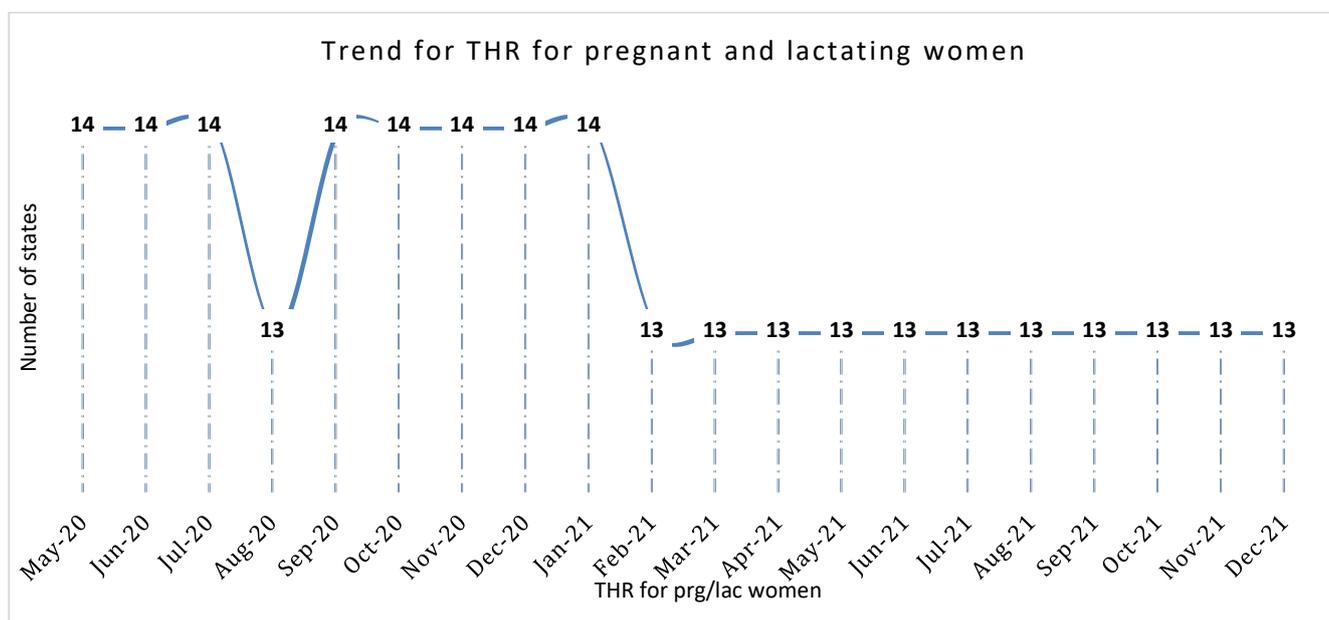


Figure 13: Trend for THR provision for pregnant and lactating women

3.2.4 Food security programs directed towards the general population

The COVID-19 pandemic affected the economy and livelihood of people. The social safety schemes that address food security of the general population play an essential role in helping the economically deprived section of the society. The following section captures the impact of pandemic on these services.

Targeted Public Distribution System (TPDS), is one of the oldest food security programmes launched by Government of India and was among the first few services to be adapted to meet food security challenges in light of the pandemic ([NFSA, n.d](#)). Along with this, Pradhan Mantri Garib Kalyan Ann Yojana (PMGKAY) was announced to provide additional free ration (5 kg of rice/wheat per person per month along with 1 kg pulse per household) to the TPDS beneficiaries to mitigate the impact of the pandemic on the food security of the underprivileged and migrant population ([MoWCD, 2021](#)) ([FAO, 2020](#)). Table 17 provides a compilation of evidence reviewed under this domain.

Table 17: Documents included in this review on provision of food security programs for general population amidst the pandemic

No	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
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1.	How India's food-based safety net is responding to the COVID-19 lockdown (IFPRI, 2020)	Narrative report, India	TPDS beneficiaries, inclusion error	During pandemic Additional grain in PDS announced in March 2020 But PDS coverage in urban areas low at 50%, leaving out many urban poor	★★★
2.	Local food systems and COVID-19 A glimpse on India's responses (FAO, 2020)	Narrative report, India	TPDS beneficiaries, Food distribution	During pandemic Kerala government provided additional 35 kg rice to Below Poverty Line (BPL) families (11.3% of population)	★★★
3.	Effect of COVID-19 on Public Distribution System in India (Pathak et al., 2020)	Narrative report, India	TPDS beneficiaries, accessibility	Struggle in lockdown: Due to exclusion errors and wrong calculations of the state-wise coverage, people not registered under TPDS were unable to access the food security schemes	★★
4.	Rapid Assessment Social Protection and Relief Measures COVID-19 Response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF, 2020)	Cross sectional, Andhra Pradesh	PMGKAY beneficiaries, additional grains	April-May 2020 Additional grain under PMGKAY – 46.4% of households availed of pulses 72.6% households could avail of additional rice Sample size: 26 Gram Panchayats from 13 districts	★★★
5.	The State of India's Poor: Volume 1 April-June 2020 Social Group: De-notified and Nomadic Tribes (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020)	Cross sectional, 114 urban and rural locations across 22 districts from 5 states in India ⁶³	TPDS Beneficiaries, De-notified and Nomadic Tribes	June 2020 Quota of ration received- 51.0% households received ration as per quota, 40.0% of the eligible households did not receive additional ration. Sample size: 114 habitations	★★

⁶³ Bihar Gujarat Madhya Pradesh Rajasthan Uttar Pradesh

6.	The need for nutritional justice: Assessing government rations to low-income communities during the COVID-19 crisis in New Delhi (Agrawal, 2020)	Narrative report, Delhi	PDS Beneficiaries, Problems in implementation	To help non PDS beneficiaries-50 lakh e-coupons-for free ration Delay in implementation due to backlog	★★
7.	The State of India's Poor: Volume 1 April-June 2020 Social Group: Muslim community (COLLECT: Community-led Local Entitlements and Claims Tracker, 2020)	Cross sectional, 53 urban and rural locations across 21 districts from 4 states in India. ⁶⁴	TPDS Beneficiaries, Minority community	April- June 2020 Received rations as per quota: 74.0% locations Additional rations received in 45.0% locations.	★★
8.	Addressing food and nutrition security (Swaminathan, 2020)	Narrative report, India	PDS Beneficiaries, composition of food kits	During pandemic Government of Kerala issued- eight million grocery kits (comprising 17-items including dal, oil, sugar, spices and soap)	★★★★
10.	Economic effects of COVID-19: Rapid surveys of rural households in India (World Bank, 2021)	Serial cross sectional, 6 states ⁶⁵	PMGKAY Beneficiaries, utilization	June 2020 and August 2020 88.0%-90.0% of respondents who were eligible to receive free rations reported receiving either rice, wheat or pulses for free from the fair price shops, however the quantity received was less than what is earmarked per person. Sample size: 5000 households	★★★★
12.	Evaluation of the Utilization of Food Support Schemes in Urban Poor Population in Rishikesh, Uttarakhand (Sharma et al., 2021)	Cross sectional, Rishikesh (Uttarakhand)	TPDS Beneficiaries, utilization	During lockdown Overall utilization of TPDS-78.0% APL households-57.0% BPL households-21.0%	★★★★

⁶⁴ Bihar Gujarat Jharkhand Uttar Pradesh

⁶⁵ Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh and Andhra Pradesh

				Sample size: 100 households	
14.	Impact of the Covid-19 Pandemic on Food Security and Indebtedness in Rural India (Niyati et al., 2021)	Cross sectional, 26 villages across 13 States ⁶⁶	TPDS, Beneficiaries, provision	September 2020 Additional food grains- 39.0% (AAY/BPL card holders) No BPL card- no ration- 27.0%	★★
				Sample size: 164 households	
15.	Food Security Response during COVID-19 and PDS Best Practices in some States/UT (WFP, 2021)	Narrative review, India	PMGKAY Beneficiaries, ration distribution	2014-2021 Nationally, under PMGKAY: 74.4 crore beneficiary covered Total distribution: 11.2 million Metric Tonnes (MT) (April-June 2020) 18.6 million MT (July-November 2020)	★★★
16.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross sectional, Chhattisgarh	Respondents: Field functionaries, Accessibility	May-June 2021 Second wave of pandemic- FPS shops were open in 28 districts Adequate ration to households, including free ration to migrant families was provided	★★
17.	Time for Universal Public Distribution System: Food Mountains and Pandemic Hunger in India (Narayan, 2021)	Narrative report, India	TPDS Beneficiaries, Challenges of TPDS	Non ration card holders (42.0% of India's population) have been largely excluded from additional food relief from the central government	★★★
18.	Impact of Lockdown on Public Distribution System with Special Reference to Sonitpur District, Assam (Mody et al., 2021)	Cross sectional, Sonitpur (Assam)	TPDS Beneficiaries, PDS consumption	July 2020-January 2021: Good services- local FPS-45.7% PDS food grain- Own consumption- 71.5% Resold- 23.8% Exchanged- 4.8%	★★★

⁶⁶ West Bengal, Bihar, Uttar Pradesh, Madhya Pradesh, Kerala, Punjab, Maharashtra, Rajasthan, Karnataka, Andhra Pradesh, Tripura, Telangana, Tamil Nadu

				(Reselling and exchange seen more in rural areas)	
				Sample size: 400	
19.	Impacts of Lockdown on Livelihood Conditions of Informal Workers in Bihar, India: A Case Study (Verma, 2022)	Cross sectional, Bihar	Informal workers, Ration provision	February-March 2021: In first wave-less quantity of food grain than mandated from FPS: 84.0%-85.0% workers	★★★
				Sample size: 150	
20.	Effect of COVID-19 pandemic on food systems and determinants of resilience in indigenous communities of Jharkhand state, India: A serial cross-sectional study (Ghosh-Jerath et al., 2022)	Serial cross sectional, Jharkhand	Tribal communities, ration provision	May-June 2020 and September-October 2020 Subsidized grains, sugar salt- 85.5% of HHs from three indigenous communities	★★★
				Sample size: 150 households	
21	Hunger Watch Report 2021 (Right to Food Campaign and Centre for Equity Studies)	Cross sectional, 11 states ⁶⁷	PMGKAY, and TPDS beneficiaries, Provision	April-Aug 2020 <ul style="list-style-type: none"> 70% received their regular PDS entitlements. 60% received these entitlements every month while a further 9.5% got their entitlements but not every month, remaining 30% did not receive anything. 88% of those who had NFSA ration cards benefitted to some extent from the free rations under PMGKAY. Single women headed families, older people without caregivers, transgenders, 	★★

⁶⁷ Chhattisgarh, Delhi, Gujrat, Jharkhand, Maharashtra, Madhya Pradesh, Rajasthan, Telangana, Tamil Nadu, Uttar Pradesh, West Bengal

PVTGs were worse affected.

Sample size: 3994

As presented in Table 17, 21 documents were reviewed to understand impact of COVID-19 on continuity of food security programmes. Pre-existing Public Distribution programme under National Food Security Act (NFSA, 2013) was modified and augmented with additional provision of 5 kg of food grains per person per month under Pradhan Mantri Garib Kalyan Ann Yojana (PMGKAY) to 80 crore (800 million) people that was launched in April 2020 and extended till March 2022 ([Central Government, 2022](#)). 111.6 lakhs (11.2 million) Metric Tonnes (MT) were distributed between April and June 2020 and 185.9 Lakh (18.6 million) MT between July-November 2020 ([WFP, 2021](#)). Additionally, some state governments like Kerala ([Swaminathan, 2020](#)), Delhi ([Agrawal, 2020](#)) and Uttar Pradesh ([Pathak et al., 2020](#)) also made extra allocations for the Below Poverty Line (BPL) families to tide over the exigency.

Different studies throw light on the coverage of PDS and PMGKAY. About 88-90% eligible beneficiaries received the free rations, though there were reports of lower quantities ([World Bank, 2021](#), [Verma, 2022](#)), some reports also suggest that more than 100 million poor people may have been excluded from PDS because of lack of ration cards and other exclusion or implementation problems ([Pathak et al., 2020](#), [Gaon connection, 2020](#), [Dreze et al., 2021](#), [Hunger Watch Report April 2020](#)) An estimated 42% population without ration cards may have been excluded from the food relief measures ([Narayan, 2021](#)). Similarly, PDS coverage in urban areas was only about 50%, leaving out a large section of urban poor ([IFPRI, 2020](#)). Difficulty in accessing food rations were also reported in studies conducted among minority communities ([COLLECT: Community-led Local Entitlements and Claims Tracker, 2020](#)) and among vulnerable nomadic and denotified ([COLLECT: Community-led Local Entitlements and Claims Tracker, 2020](#)) and daily wage labourers ([IFPRI, 2020](#)).

Thus, while Government of India did initiate measures to provide food security through existing public distribution system and enhanced allocation of food grains and pulses through PMGKAY, challenges in access remained due to exclusion errors in PDS and exclusion of a large section of poor community from this system. In times of pandemic, such social safety measures need to be made more responsive and inclusive.

Key highlights on impact of pandemic on immediate determinants of nutrition

- Dietary diversity saw a decline among both children and adults due to non-availability, non-affordability and sometimes myths associated with Covid pandemic. The impact was felt more among the food-insecure families due to economic reasons. There is a paucity of data with respect to nutrient intake of the population amidst the pandemic.
- Overall health and nutrition services were affected in the first lockdown but recovered in the subsequent unlocking phases. Despite AWC not being entirely functional, the THR distribution to children showed minimal variation in trend across various states. Modality for PM-POSHAN (MDM) delivery varied throughout the duration of pandemic, ranging from door-to-door service to cash transfers. While services like PMMVY showed minimal variation in continuity, there is very limited national-level data pertaining to the pandemic duration.

- Food security was affected during the pandemic period. The additional rations allocated by the Government provided succour to the families, but many poor families were left out of the ambit of the food security net due to exclusion errors and systems issues. Urban poor and migrant labourers were particularly affected due to low coverage of PDS.



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CHAPTER 4: Impact of COVID-19 on underlying determinants of nutrition

Nutritional outcomes cannot be solely attributed to dietary, nutritional intakes and diseases. Several underlying factors such as food production, its access and environmental factors have an impact. Therefore, it becomes essential to understand the current status of these underlying determinants and explore the impact of pandemic on these factors.

4.1 Food production and availability dimension of food security amidst the pandemic

In the following sections, impact of COVID-19 on food production is discussed with a focus on dimensions like agricultural production and supply chain. Agriculture is a crucial sector of the Indian economy with a significant percentage of the population dependent on it. Any change in production and the subsequent variation in supply chain influences food availability which in turn affects food access and consumption at the population level. Documents reviewed in this domain are compiled in Table 18.

Table 18: Documents included in this review to understand change in agricultural production and supply chain amidst the pandemic

No	Title (Author/Organization , Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	How India's agri-food supply chains fared during the COVID-19 lockdown, from farm to fork (IFPRI, 2020)	Narrative review, India	Farmers, sale of produce	During the lockdown the food supply system was severely disrupted, consumer prices rose while producer prices crashed, markets were closed, and labour was in short supply. Small scale shops and informal street retailers were able to negotiate lockdown challenges better than modern organized retailers. Government support came through large scale procurement of wheat, local procurement of milk and horticulture products for direct distribution. Food insecurity remained high especially in urban areas. Two months into lockdown retail prices of food increased by more than 20.0% on average in small cities	★★★★
2.	Impact of COVID-19 on agriculture sector: Study of 5 villages in Marathwada region, Maharashtra (Kelkar, 2020)	Cross sectional, Maharashtra	Farmers, challenges in pandemic	June-July 2020 Farmers faced issues like price crash, lack of market access, fall in market demand and halting of investment decisions Reverse migration of family members caused lack of labour force but saved labour cost Sample size: 55	★★
3.	Impact of COVID on agriculture in India (Hari et al., 2020)	Narrative report, India	Farmers, Challenges in pandemic	During pandemic Disruptions in activities like production, storage, transportation and trading of agricultural products	★★★★
4.	COVID-19 and agriculture: A story of resilience (WTO, 2020)	Narrative report, Global	Farmers, Supply chain dynamics	India upgraded its supply chain infrastructure to aid farmers and reduce food waste	★★★★
5.	Impact assessment of COVID-19 on Indian Agriculture (NABARD, 2020)	Cross sectional, 560 districts, 33 States	Agriculture and allied sectors, Production	April-May 2020 Highest declined in poultry (19.6%), fisheries (13.6%), pig/sheep/goat (8.9%) and dairy (6.6%)	★★

		India		Crop production (2.7%) and horticulture (5.7%) least impacted Sample size: 401 DDMs of NABARD	
6.	Impact of COVID-19 on agricultural markets: assessing the roles of commodity characteristics, disease caseload and market reforms (Varshney et al., 2020)	Narrative review, India	Consumers Market availability	In April 2020 Drop of 20.0% in market arrivals of vegetables and fruits After first lockdown Drop of 10.0% in the online availability of various foods	★★★★
7.	COVID-19 Lockdown, Food Systems and Urban–Rural Partnership (Sukhwani et al., 2020)	Cross Sectional, Nagpur (Maharashtra)	Respondents: Municipal corporation employees Food supply chain disruptions	April 2020 Respondents reported that restricted transportation along with closure of wholesale food markets resulted in disruption in supply chain of food grain and grocery Open spaces were created to decentralize the food markets to ensure COVID appropriate selling of goods Sample size: 346	★★★★
8.	Food system disruption: COVID-19 and vegetable producers in India (Harris et al., 2020)	Cross sectional, 4 states ⁶⁸	Women farmers, production	May 2020 About 87.0% of farmers reported disruptions to production 79.0% reported disruptions to sale of produce Sample size: 448	★★★★
9.	COVID-19 and supply chain disruption: evidence from food markets in India (Mahajan et al., 2020)	Narrative, 3 metro cities ⁶⁹	Secondary data, online availability of food items	March-April 2020 Online availability fell for fruits and vegetables (8.0%), edible oils (14.0%) no changes for cereals and pulses Online product availability fell by 10.0% on average	★★★★
10.	An assessment of socioeconomic impact of COVID-19 pandemic in India (Aneja et al., 2020)	Narrative, India	Farmers, Production for Rabi and Kharif season	Post lockdown Rabi harvesting gone smoothly; Minimum support price increase for Kharif crops announced, ensuring farmers a 50.0%–83.0% return on their investment	★★★★

⁶⁸ Assam, Jharkhand, Andhra Pradesh, Karnataka

⁶⁹ Delhi, Mumbai, Kolkata

11.	Crop prices, farm incomes, and food security during the COVID-19 pandemic in India: Phone-based producer survey evidence from Haryana State (Ceballos et al., 2020)	Cross sectional, Haryana	Farmers, Input procurement	March-June 2020 While wheat producers suffered minimal decline in income due to Government support, the income of tomato producers fell by 50% as they shifted from wholesale to retail local markets Sample size: 1767 tomato and wheat producers	★★★
12.	Impacts of a national lockdown on smallholder farmers' income and food security: Empirical evidence from two states in India (Ceballos et al., 2020)	Cross sectional, 2 states ⁷⁰	Farmer, Harvesting wheat and black gram	April-May 2020 In Haryana, pre-existing market infrastructure allowed the state to sustain procurement at stable prices, limiting impacts on smallholder production. As consumers, farmers in Haryana faced more disruptions than those in Odisha, due to reduced availability of foods in the markets, whereas farmers in Odisha benefited from more diverse cropping patterns and increased local supply of foods following transport restrictions. Sample size: 1515 producers	★★
13.	The COVID-19 induced disruptions across groundnut value chain: Empirical Evidence from South India (Nandi et al., 2021)	Cross sectional, Andhra Pradesh	Suppliers and consumers, Food price	COVID-19 pandemic created a double burden on farmers by disrupting farm production on one side and decreased diet diversity on the other. Disruption in farm productions resulted in a decline in household income and increased consumer food prices. 98.5% households reported decrease in income due to COVID-19 restrictions. Sample size: 264	★★★
14.	Economic effects of COVID-19: Rapid surveys of rural households in India (World Bank, 2021)	Serial cross sectional, 6 states ⁷¹	Farmers, Production	June 2020 and August 2020 As compared to baseline, in endline, 20.0% farmers continued cultivating in same crop category, while some shifted to cereals (21.0%) and pulses and oilseeds (9.0%) cultivation	★★★

⁷⁰ Haryana and Odisha

⁷¹ Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh and Andhra Pradesh

Sample size: 2175					
15.	Impact of the COVID-19 pandemic on agricultural production, livelihoods, and food security in India: baseline results of a phone survey (Jaacks et al., 2021)	Cross sectional study, 12 states ⁷²	Agricultural production	May 2020 COVID-19 lockdown in India has primarily impacted farmers' ability to sell their crops and livestock products and decreased daily wages and dietary diversity. Sample size: 1437	★ ★ ★
16.	Impact of crop diversity on dietary diversity among farmers in India during the COVID-19 pandemic (Connor et al., 2021)	Cohort, 12 states ⁷³	Farmers, agricultural production	May 2020 and August 2020 Farmers with more crop diversity were more resilient to market disruptions from the COVID-19 pandemic Sample size: 833	★ ★ ★
17.	Impact of COVID-19 on food security insights from Telangana (Ravula et al., 2021)	Qualitative, Telangana	Farmers, supply chain	July-August 2020 Tribal areas, millets and cereals were procured by the government No losses were incurred by farmers who grew cereals and millets	★
18.	Covid-19, disrupted vegetable supply chain and direct marketing: experiences from India (Tripathi et al., 2021)	Cross sectional, 7 states ⁷⁴	Secondary data analysis, Supply chain	March-May (2019 and 2020) Low quantities of vegetables reaching the mandis (Onion- 91.0% less influx in April, Maharashtra) Potato price doubled in 2020 as compared to 2019 Potato production in Gujrat reduced by 62.0% in April 2019 as compared to 2019	★ ★ ★
19.	India Agri food start-up investment report (Omivore et al., 2021)	Narrative report, India	Consumers and producers, supply chain	Amidst lockdown markets shut, transportation services halted, and agricultural labour wasn't accessible	★ ★ ★
20.	Effects of the COVID-19 pandemic on farmers and their responses: A study of three farming systems in Kerala,	Cross sectional, Kerala	Farmers, selling of produce	40.0% farmers started to sell their produce from home after the pandemic began 89.0% of farmers received adequate support from Krishi Bhawan to navigate the crisis	★ ★

⁷² Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Punjab, Rajasthan, Telangana, Uttar Pradesh, West Bengal, Haryana and Maharashtra

⁷³ Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Telangana, Uttar Pradesh, and West Bengal

⁷⁴ Gujrat, West Bengal, Uttar Pradesh, Maharashtra, Karnataka, Madhya Pradesh, Andhra Pradesh

South India (Menon et al., 2022)					
21.	Impact of COVID-19 on the Agriculture Sector: Survey Analysis of Farmer Responses from Kerala and Tamil Nadu States in India (Habanyati et al., 2022)	Cross sectional, 2 states ⁷⁵	Farmers, Crop loss	March to May 2021 Overall, 20.0% respondents reported crop loss Rice, bananas, vegetables, coconuts, flowers saw maximum crop loss Pulses, groundnuts, cotton, and rubber saw minimum crop loss Sample: 250	★★
22.	Global impact of COVID-19 on agriculture: role of sustainable agriculture and digital farming (Sridhar et al., 2022)	Narrative report, global	General population, Supply chain resilience	Amidst pandemic In India, shortage of truck drivers for transporting goods Fear of infection among workers and migrant labourers led to disruption in supply chain	★★★
23.	COVID-19, India, small scale farmers and indigenous Adivasi communities- the answer to future lies in going back to the basics (Hansda, 2022)	Narrative report, India	General population, Supply chain disruption	During lockdown Agriculturally prosperous states faced labour shortages due to reverse migration led to disruption of supply chain	★★

As presented in Table 18, 23 documents were reviewed to understand the impact of pandemic on agricultural production and supply chain. Farmers in most states reported supply and market disruptions ([IFPRI, 2020](#), [Sridhar et al., 2022](#), [Omivore et al., 2021](#), [Harris et al., 2020](#), [Sukhwani et al., 2020](#)). During the initial phase of pandemic, nationally, agricultural production was only marginally affected (-2.7%) as harvest of Rabi crops like wheat was almost complete by the end of April 2020. Minimum Support Price (MSP) increased for Kharif crops, ensuring farmers a 50.0%–83.0% return on their investment ([Aneja et al., 2020](#)). In case of tribal areas of Telangana, millets and cereals were procured by the government agricultural department at the farm gate and thereby no losses were incurred by farmers who grew cereals and millets ([Ravula et al., 2021](#)). Many studies have reported shortage of agricultural labourers, difficulty in transportation ([Hansda, 2022](#), [Sridhar et al., 2022](#)). Provision of minimum support price by Government helped farmers tide over the crisis in some cases ([Ceballos et al., 2020](#), [Menon et al., 2022](#)). Again, farmers who grew diverse crops were less affected ([Ravula et al., 2021](#), [Ceballos et al., 2020](#)). Food prices fell sharply due to market closure affecting family income and household food security ([Jaacks et al., 2021](#), [Nandi et al., 2021](#)).

However, production in allied sector had declined significantly, especially in poultry sector (-19.5%), followed by fisheries sector (-13.6%) primarily due to drastic decline in demand for these products ([NABARD, 2020](#)). This may be attributed to the widespread fear circulating in the wake of COVID-19 regarding safety of non-vegetarian foods. Similarly, production in dairy (-6.6%) and horticulture (-5.7%) sub-sectors also reduced, owing to reduced

⁷⁵ Kerala and Tamil Nadu

demand for these products and disruption in their supply chain. Owing to the fluctuation in production, availability of agricultural produce in the markets were also affected. Nationally, drop of nearly 20.0% in market arrivals of vegetables and fruits was observed ([Varshney et al., 2020](#)). Although availability reduced for fruits and vegetables (8.0%), and edible oils (14.0%) during lockdown, no changes was observed for cereals and pulses ([Mahajan et al., 2020](#)).

This disrupted food supply chain needs efforts in creating an enabling environment by devising policies for controlling the food prices, the shorter supply chain for local produce, farmers cooperatives for promoting consumption of local produce are need of the hour.

4.2 Food accessibility dimension of food security amidst the pandemic

In the following section, food accessibility is discussed in terms of loss of livelihood and change in food price along with food preparation and handling practices amidst COVID-19.

4.2.1 Loss of livelihood, change in food price and resulting household food security amidst the pandemic

In the wake of COVID-19 pandemic, global economy was disrupted. Similarly, in India, livelihood and income of the general population was affected. Along with this, change in food price was also evident. Table 19 is a compilation of documents reviewed in this domain.

Table 19: Documents included in this review to understand loss of livelihood, change in food price and resulting food insecurity amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, Key variables	Key findings	Evidence strength
1.	COVID-19 livelihoods survey (APU, 2020)	Cross sectional, 12 states ⁷⁶	Informal workers, Job loss	April-May 2020 Job losses was higher among Minority communities (81.0% compared to Hindu 65.0%), women (60.0% compared to men 53.0%) Sample size: 4550	★★
2.	The State of India's Poor: Volume 1 April-June 2020 Social Group: Denotified and Nomadic Tribes (COLLECT: Community-led Local Entitlements	Cross sectional, 5 states ⁷⁷	Beneficiaries of MGNREGA, tribal population, employment	June 2020, Employment guarantee under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): 23.5-31.0% did not receive employment	★★

⁷⁶ 12 states: West Bengal (Rural), Delhi (Urban), Andhra Pradesh (Rural), Gujarat, Maharashtra (Pune), Telangana (Rural), Jharkhand (Rural), Rajasthan, Odisha, Madhya Pradesh (Rural), Karnataka, Bihar (Rural)

⁷⁷ Bihar Gujarat Madhya Pradesh Rajasthan Uttar Pradesh

	and Claims Tracker, 2020)			4.0%-11.0% received full payment of work completed in April, May, June) Sample size: 114 hamlets	
3.	Impact of COVID-19 on Indian villages (Modak et al., 2020)	Qualitative, 10 states ⁷⁸	Farmers, food pricing fluctuations	April 2021 Key challenges highlighted: Low cash availability, price fluctuations of agriculture commodities, and increased indebtedness Sample size: 52 informants, 13 were from landlord households, 23 from peasant households, 16 from manual worker households	★★★
4.	Efficacy of government entitlements for low-income families during COVID-19 (Dalberg, 2020)	Cohort, 15 states ⁷⁹	Job loss, income	April and June 2020 Primary income earners in 52.0% of Household lost job in June as compared to 40.0% Household on May In May, 40.0% household accumulated debt to address this loss	★★★
5.	Workers in the time of Covid-19 (Action Aid, 2020)	Cross sectional, 19 states ⁸⁰	Workers, loss of Income	May 2020 Amidist lockdown, 48.0% respondents did not receive any wages and 17.0% received partial wages Women in agricultural labour lost job (81.0%) as compared to men (74.8%) 52.0% women as compared to 46.0% men did not receive any wages Sample size: 11,530	★★★
6.	Experience of the COVID-19 pandemic in rural Odisha, India: knowledge, preventative actions, and impacts on daily life (Bauza et al., 2020)	Cross sectional, rural Odisha	General population, loss of job	May-July 2020 Challenges reported like 31.0% faced job loss 93.0% faced economic security concerns Sample size: 131 participants, 73 head of household, 21 member of village water and sanitation committee, 37 caregivers	★★★

⁷⁸ Bihar, Karnataka, Kerala, Maharashtra, Punjab, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal, Madhya Pradesh

⁷⁹ Assam, Bihar, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Telangana, Uttar Pradesh and West Bengal

⁸⁰ Andhra Pradesh, Telangana, Delhi, Bihar, Goa, Gujrat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal

7.	A hidden cost: The pandemic's impact on nutrition (Accountability Initiative, 2020)	Narrative report, India	General population, unemployment rate	May 2020, Unemployment had shot up to over 23.0 % as compared to 7.0-8.0% pre-COVID and earnings reduced for those employed	☆☆☆
8.	COVID lockdown, how people managed and impact of welfare schemes on informal sector workers: Evidence from Delhi slums (Das et al., 2020)	Cross sectional, Delhi	Income, informal workers	April-May 2020 Average daily wage rate prior to the lockdown was Rs.426 During lockdown, 98.0% of families did not earn anything but spent an average of Rs.225 per day Sample size: 199 slum households	☆☆☆
9.	Workers in the time of COVID 19 Evidence from a rapid assessment in Bihar (ActionAid, 2020)	Cross sectional, Bihar	Informal workers, change in income	May 2020 60.0% of the respondents reported an average income loss 26.0% returning migrant lost their jobs Sample size: 177 workers	☆☆☆
10.	Women's access to agriculture extension amidst COVID-19: Insights from Gujarat, India and Dang, Nepal (Alvi et al., 2021)	Cohort, Gujrat	Women farmers, income	May-June 2020 and August-September 2020 Economic loss due to lockdown was reported by 78.0% of respondents at base line reduced to 51.0 % at endline Sample size: 228 women farmers	☆☆☆
11.	Understanding labour market disruptions and job losses amidst COVID-19 (Mangain, 2021)	Cross sectional, India (Based on CMIE data)	Labour workers, Job losses, unemployment rate	February-June 2020 Job losses among women increased from 0.2 million to 2.1 million as compared to men (9.9 million to 30 million), 16.6% reduction in employment among urban youth from February to June 2020, 13.3% reduction in employment among scheduled cast from February to June 2020 Sample size: 174,405 households	☆☆☆

12.	Pandemic prices: COVID-19 price shocks and their implications for nutrition security in India (TATA Cornell, 2020)	Cross sectional, 11 cities ⁸¹	Secondary data analysis, Food prices	March-May 2020 Rise in prices across food groups (higher for non-cereals than for cereal) Prices stabilised quickly to pre-lockdown levels for cereals, eggs, and vegetables (potatoes, onions, and tomatoes) after the lockdown The price remained high for nutritionally rich crops (pulses, despite the lifting of lockdown)	★★★
13.	Economic effects of COVID-19: Rapid surveys of rural households in India (World Bank, 2021)	Serial cross sectional, 6 states ⁸²	Farmer, income	March 2020 and May 2020 Rise in reported levels of unemployment (16.0% increase) Sample size: 2175	★★★
14.	Pandemic, informality, and vulnerability: impact of COVID-19 on livelihoods (Kesar et al., 2021)	Cross sectional, 12 states ⁸³	Workers, job loss	April-May 2020 Across employment types and social identities, earnings fell by an enormous margin of 40–50 per cent. Notably, 48 per cent of the regular salaried workers reported either not having received any salary or a reduced salary during the lockdown period. For casual workers who continued to be employed during the lockdown, this drop in earnings is partly a result of decreased availability of work and partly a fall in the wage rate. The median number of days worked per week fell from 3.75–1.8 (mean fell from 3.7–2.3), while the median (daily) wage rate fell by INR 50 (a mean fall of INR 80). Sample: 4942 respondents	★★★
15.	Survey finds severe impact of second wave on nutrition and	Cross-sectional, Tamil Nadu	Workers and small	May 2021 For entire lockdown Rudraprayag and tehri 76.0%	★

⁸¹ Bengaluru, Chennai, Delhi, Hyderabad, Mumbai, Kolkata, Bhubaneswar, Bhopal, Patna, Guwahati, Lucknow

⁸² Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh and Andhra Pradesh

⁸³ 12 states: West Bengal (Rural), Delhi (Urban), Andhra Pradesh (Rural), Gujarat, Maharashtra (Pune), Telangana (Rural), Jharkhand (Rural), Rajasthan, Odisha, Madhya Pradesh (Rural), Karnataka, Bihar (Rural)

	employment (KISLAY, 2021)	and Uttarakhand	farmers, employment	of respondents unemployed, for more than half of lockdown 100% respondents in Tamil Nadu were unemployed 83% of participants in Dehradun, 93.67% of participants Uttarakhand, and 96.75% in Tamil Nadu had had to reduce their consumption of at least one food item between April 1 st and May 15 th because of lack of money. Sample: 1029	
16.	Explaining the income and consumption effects of COVID-19 in India (Gupta et al., 2021)	Narrative, India (Based on CMIE data)	Works, changes in household Income	Income of daily wage workers fell by 75% compared to 35% among salaried people. Relative price of food did not increase during lockdown as compared to price shocks outside food sector.	★★
17.	Assessing impact of the COVID-19 pandemic on socio-economic situation of vulnerable population through community-based monitoring (UNICEF, 2021)	Cohort, 7 states ⁸⁴	Workers, wage loss	June-December 2020 (4 phases) Daily wages in December (phase 4) were less than pre lockdown levels as reported by 75.0% of urban and 60.0% of rural respondents Sample size: 5,000 households in the first phase and 6,000 households in each successive phase	★★★
18.	Impacts of the COVID-19 pandemic on food prices: Evidence from storable and perishable commodities in India (Beragi et al., 2022)	Narrative report, 6 states ⁸⁵	Secondary data, Change in price	May-July 2020 Wheat flour price by 3.0% Rice price increased by 16.0% Onion prices decreased by about 61.0% (due to decreased demand from hotels) Government was the largest cereals buyer	★★
19.	COVID-19, India, small scale farmers and indigenous Adivasi communities-the answer to future lies in	Narrative report, India	Adivasi, Livelihood	During lockdown, Forest dependent Adivasis communities largely affected: Disrupted forest-based livelihoods	★★

⁸⁴ Uttar Pradesh, Tamil Nadu, Rajasthan, Maharashtra, Andhra Pradesh, Telangana, Gujarat

⁸⁵ Andhra Pradesh, Bihar, Jharkhand, Madhya Pradesh, Rajasthan, and Uttar Pradesh

	going back to the basics (Hansda, 2022)				
20.	Effect of COVID-19 pandemic on Food systems and determinants of resilience in indigenous communities of Jharkhand state, India: A serial cross-sectional study (Ghosh-Jerath et al., 2022)	Serial cross sectional, Jharkhand	Tribal population, Income and livelihood	May-June 2020 and September-October 2020 Reduction in household income in lockdown was reported by 77.0% household which reduced to 42.4% household in unlock (p<0.307)	★★★
21.	Impacts of Lockdown on Livelihood Conditions of Informal Workers in Bihar, India: A Case Study (Verma, 2022)	Cross sectional, Bihar	informal workers, Income	February-March 2021 No employment under MNREGA reported by 96.0% informal workers	★★★
22.	India Consumer Price Index (CPI) (Trading economics, accessed on 07.05.22)	Data visualization portal, India	General population, price inflation	Consumer Price Index CPI in India increased to 167.70 points in March from 166.10 points in February of 2022	NR
23.	Evaluation of the Utilization of Food Support Schemes in Urban Poor Population in Rishikesh, Uttarakhand (Sharma et al., 2021)	Cross sectional, Rishikesh (Uttarakhand)	Urban slums, household food security	During pandemic Food insecure household – 52.0% Out of this 20.0% household were severely food insecure and 4.0% household were mildly insecure	★★★
24.	Food system disruption: initial livelihood and dietary effects of COVID-19 on vegetable producers in India (Harris et al., 2020)	Cross sectional, 4 states ⁸⁶	Farming household, dietary disruption	May 2020 17.0% of households reported a fall in ability to procure staple foods Disruption in daily diets: 62.0%. Sample: 448	★★★
25.	Workers in the time of COVID-19 (ActionAid, 2020)	Cross sectional, 19 states ⁸⁷	Migrant workers, household dietary intake	May 2020 18.5% household -sufficient consumption 63.0% household -two meals per day 34.0% household -1 meal per day 3.0% household – 1 meal per 2days	★★★

⁸⁶ Assam, Jharkhand, Andhra Pradesh, Karnataka

⁸⁷ Andhra Pradesh, Telangana, Delhi, Bihar, Goa, Gujrat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal

Studies and analysis of Centre for Monitoring Indian Economy (CMIE) data in Table 19 show widespread loss of livelihood and income during the pandemic period ([World Bank, 2021](#), [Mangain, 2021](#), [Dalberg, 2020](#), [Kesar et al., 2021](#), [Accountability Initiative, 2020](#)). Many studies reported that workers did not get their wages during this period ([Action Aid, 2020](#)). Household income reduced significantly ([Ghosh-Jerath et al., 2022](#), [UNICEF, 2021](#), [Bauza et al., 2020](#)) and one study showed that forest based livelihood was disrupted for tribal households who also faced encroachment on their land ([Hansda, 2022](#)). The job losses were higher for women, migrant and daily wage labourers ([Mangain, 2021](#), [APU, 2020](#), [Kesar et al., 2021](#), [Action Aid, 2020](#)). As shown in Figure 14, food price inflation was very high during the pandemic period. All these factors affected the accessibility to good quality diet at the household level ([Sharma et al., 2021](#)) ([Harris et al., 2020](#)). Pandemic greatly impacted household food intake and dietary diversity. In the first year of pandemic, across 19 states in India, about 34.0% of the families had access to only one meal per day ([Action Aid, 2020](#)). Overall, the low Socio-economic status (SES) communities experienced food insecurity subsequently affecting their diet diversity. About 17.0% of households reported a fall in ability to procure staple foods (Assam, Andhra Pradesh, Karnataka, Jharkhand) ([Harris et al., 2020](#)). Government of India and different state governments increased allocation under MNREGA to provide social safety to daily wage workers ([PIB release, 26.3.2020](#)). However some studies show that a large section of informal workers could not access the employment programme ([Verma, 2022](#)) ([COLLECT: Community-led Local Entitlements and Claims Tracker, 2020](#)).

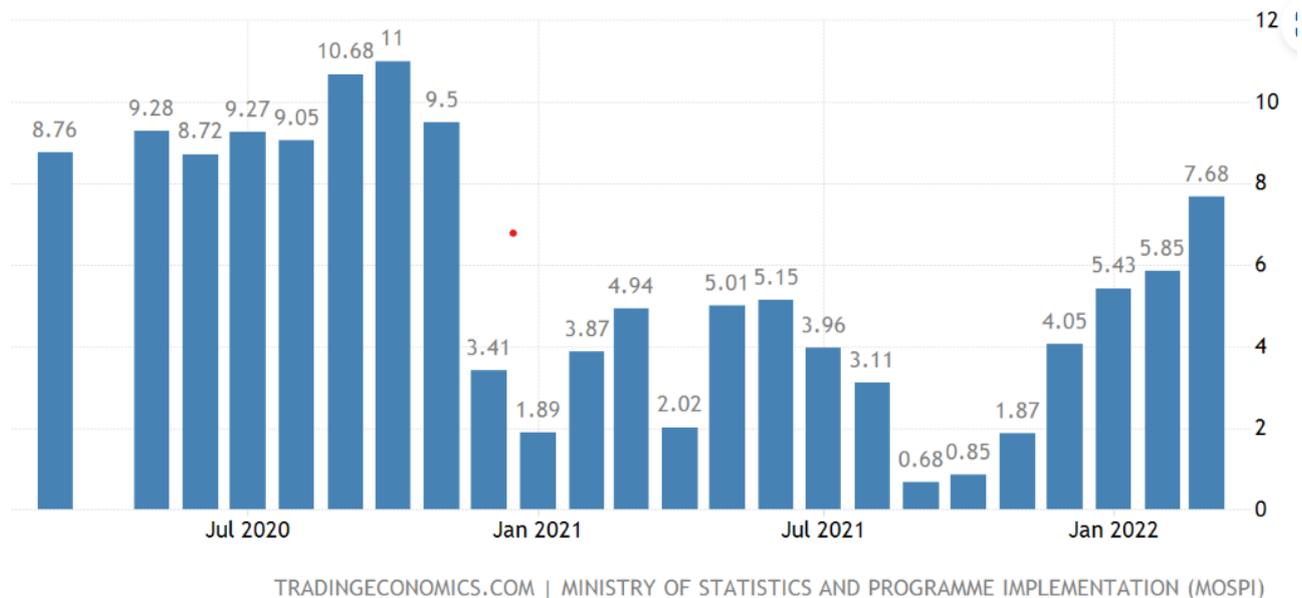


Figure 14: Food Price Inflation from March 2020 to Mar 2022 [MOSPI](#)

4.2.2 Safe food preparation and handling practices during COVID-19

Given the human-to-human transmission of COVID-19, safe food preparation and care practices were considered crucial for containing the virus. During the pandemic, some observations were documented and recommendations given on COVID-19 appropriate food preparation, handling and care practices. One such document is reviewed and tabulated in Table 20.

Table 20: Documents included in this review to understand safe food preparation and handling practices during COVID-19

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, Key variables	Key findings	Evidence strength
1.	Food consumption pattern and food handlers hygienic practices during COVID-19 outbreak among South Indian population (Devagappanavar et.al, 2020)	Cross sectional, Gadag (Karnataka)	Adults (20-60 years), Change in food preparation	February-March 2020 Proper hand washing before food preparation (86.3%), cleaning of utensils using hot water along with dish wash bar increased from 0.8% pre-COVID to 46.0% during	★★

As shown in table 20, one study shows that food handling practices improved significantly during the entire course of the pandemic. Usage of hot water for cleaning utensils with dishwash bar increased to 46.0%. Handwashing before eating food was practiced by majority in the southern states of India (83.0%) (Devagappanavar et.al, 2020).

4.3 Environmental factors affecting nutritional status during COVID-19

A healthy environment that prevents infections and facilitates health promotion during the pandemic with appropriate nutrition-sensitive practices is an essential underlying determinant for nutritional outcomes. An environment that facilitates access to optimal health and nutrition services, optimal Water Sanitation and Hygiene (WASH) practices and enabling social and behavioural change communication strategies for health promotion is highly desirable amidst the pandemic.

4.3.1 Continuity of nutrition sensitive services to address underlying determinants of nutrition during the pandemic

Nutrition sensitive services like ANC and PMMVY (Pradhan Mantri Matru Vandana Yojana) indirectly affect the nutritional status. Continuity of these services amidst the pandemic are discussed in the following sections.

A. Antenatal and Post-natal care (ANC and PNC) practices

Antenatal care (ANC) can reduce health risks for mothers and their infants by monitoring pregnancies and screening for complications. With the onset of pandemic, delivery of ANC service was affected. Table 21 provides a compilation of documents reviewed under this domain.

Table 21: Documents included in this review on status of ANC and PNC practices amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, Key variables	Key findings	Evidence Strength
1.	Rapid assessment	Cross sectional,	Pregnant women, ANC visit	April-May 2020	★★

	social protection and relief measures COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF, 2020)	Andhra Pradesh		Majority received ANC throughout the lockdown in 76.0% of Gram Panchayats. Sample: 26 Gram Panchayats from 13 districts	
2.	Rights of Vulnerable Families and Children of India under COVID-19: Implications for effective response and mitigation strategies (Save The Children, 2020)	Cohort, 16 states and UTs ⁸⁸	Pregnant women, ANC utilization Vulnerable population	June 2020 (or baseline) ANC low utilization (10.0%), service utilization was higher in rural areas (13.0%) as compared to urban (7.0%) Sample size: Sample: 7239	★★★
3.	RMNCAH-N Services During COVID-19: A spotlight on India's policy responses to maintain and adapt essential health services (PATH, 2021)	Narrative Report, India	Pregnant women, ANC	Amidst lockdown, reduced antenatal care (ANC) visits. Began to recover in May 2020 when lockdown measures slightly relaxed.	★★★
4.	Continuity of antenatal care services in Chhattisgarh during COVID-19 (Singh et al., 2021)	Cross sectional, Chhattisgarh	Pregnant women, ANC coverage	July 2020 Overall excellent coverage (96.7%) 3.3% women: No ANC visit Sharp reduction 1 st (86.1%) to 4 th (50.7%) ANC visit Sample size: 1483	★★
5.	Strategic policy adaptations to mitigate the effect of COVID-19 on maternal and child health services, Rajasthan (IPE Global, 2021)	Qualitative study, Rajasthan	Pregnant women, ANC	2020 MNCHN days/Meetings declined in April-June 2020. Follow ups were done over phone or home visits	★★
6.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children, 2021)	Cross sectional, Delhi	Pregnant women, ANC	November 2020 94.0% of pregnant women received at least 1 ANC Sample size: 23 pregnant women and 15 lactating women	★★★
7.	Estimating the impact of COVID-19 pandemic related lockdown on utilization of maternal and perinatal health services in an urban neighbourhood in Delhi, India (Sinha et al., 2022)	Cross sectional, Delhi	Pregnant women, ANC and PNC	August- November 2020 As compared to women who delivered pre-lockdown, 84.3% women who delivered post lockdown received 4 or more ANC as compared to 97.3% who delivered pre lockdown (aOR 0.3 95% CI 0.1,0.5)	★★★

⁸⁸ Assam, West Bengal, Bihar, Jharkhand, Odisha, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Himachal Pradesh, Andhra Pradesh, Telangana, Tamil Nadu, Jammu Kashmir and Delhi

				97.1% institutional delivery before lockdown as compared to 93.5% institutional delivery after lockdown (aOR 0.5 95% CI 0.1, 2.3) Sample size: 199 women	
8.	Evidence based response to early childhood development during the COVID-19 crisis (Dalberg, 2022)	Cross sectional, 11 states ⁸⁹	Pregnant women, ANC	September 2020-February 65.0% pregnant women ANC in 1 st trimester; only 27.0% in 2 nd trimester. Sample size: 10112	★★★
9.	Anaemia Mukht Bharat (accessed on 6.04.22)	Dashboard	ANC	Reduction in ANC utilization over the last 3 years Pregnant women registered for ANC reduced from 95.0% to 85.3% from June 2019 to June 2021	NR
10.	ICDS system strengthening and community mobilization Gadchiroli (Maharashtra) endline report on key indicators (TATA Trusts, Gadchiroli, 2021)	Cross sectional, Gadchiroli (Maharashtra)	Pregnant women, Immunization	Pre-COVID (2019): 67.5 %; During-COVID (2021): 6.9% Utilization of counselling services Pre-pandemic (2019): Below 3 years: 59.0% Above 3 years: 41.5% Pregnant women: 45.2% During pandemic (2021): Below 3 years: 52.3% Above 3 years: 14.2% Pregnant women: 21.2% (Intervention data, CI for the pre-post comparison not available) Sample: 450	★★★
11.	Effect of COVID-19 on programs aimed at improving health and nutrition status of women and children in Rajasthan (Development Solutions Inc, 2021)	Qualitative study, Rajasthan	Pregnant women, Immunization coverage	No immunization services – between March to May 2020	★★
12.	ICDS system strengthening and community mobilization Chandrapur (Maharashtra)	Serial cross sectional, Chandrapur	Pregnant women, Immunization	Pre-COVID (2019): 90.5%; During-COVID (2020): 3.5% Utilization of counselling services Pre-pandemic (2019):	★★★

⁸⁹ Andhra Pradesh, Assam, Bihar, Haryana, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh

Endline report on key indicators (TATA Trusts, Chandrapur, 2021)		(Maharashtra)		Below 3 years- 37.9% Above 3 years- 59.5% Pregnant women- 66.5%	
				During pandemic (2020): Below 3 years- 23.7% Above 3 years- 16.8% Pregnant women:32.8% (Intervention data, CI for the pre-post comparison not available)	
				Sample: 450	
13.	Managing High Risk Pregnancy in Himachal Pradesh, SEWA – Systems E-Approach for Women at Risk (IPE Global, 2020)	Cross sectional study, Himachal Pradesh	HRP tracking	September 2019- October 2020 High Risk Pregnancy (HRP) identified via app tracking App registered- 374 HRP case in COVID Text message reminders- improved engagement	★★★

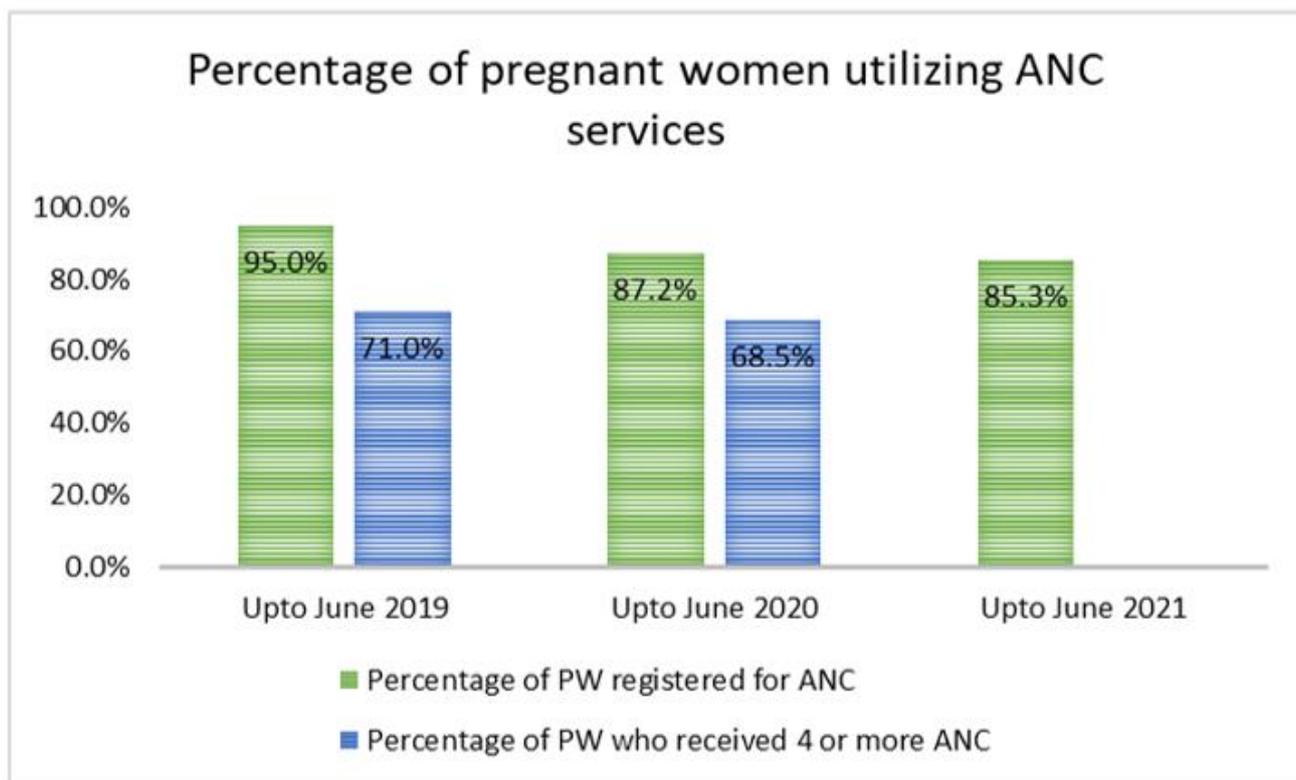
As presented in Table 21, 12 documents and a data dashboard were reviewed to understand the impact of pandemic on continuity of ANC services. With the onset of COVID-19 pandemic in India, efficient delivery of healthcare services for pregnant women became a major challenge. As shown in figure 15, according to Anaemia Mukht Bharat portal, ANC utilization at the national level has reduced over the last 3 years. Prior to the pandemic, ANC registration was more than 90.0% (June 2019), and utilization of more than 4 ANC was about 70.0% ([AMB dashboard](#)). Latest data since June 2020 for 4 or more ANC and since June 2021 for registered pregnant women is not available in public domain to see whether there has been any recovery. Overall, across 16 states and Union Territories⁹⁰ only 10.0% of vulnerable population used ANC including 13.0% in rural and 7.0% in urban areas ([Save The Children, 2020](#)). Another study from 11 states⁹¹ highlighted that in 2020, 65.0% of then currently pregnant women accessed 1st ANC and 27.0% accessed the 2nd ANC ([Dalberg, 2022](#)). On the other hand, some states showed encouraging trends. Pregnant women receiving ANC check-ups during lockdown was as high as 88.0% and 97.0% respectively for the states of Andhra Pradesh and Chhattisgarh ([Singh et al., 2021, UNICEF, 2020](#)). Although, coverage of ANC decreases from 1st to 4th visits, more than 95.0% of ANC visits were completed in most critical times of early pandemic, when many other services were hampered (Chhattisgarh) ([Singh et al., 2021](#)). Similarly in Delhi, 83.0% of pregnant women received ANC check-up during 1st trimester and the number dropped to 44.0% during 2nd and 3rd trimester ([Save The Children, 2021](#)). Very limited data is available to understand the status of immunization among pregnant women amidst the pandemic. Following the substantial disruption of the delivery of essential health services, such as, routine immunization across the country due to COVID-19 pandemic, immunization services were suspended completely, especially during the initial phases of lockdown (e.g. in Rajasthan) ([Development Solutions Inc, 2021](#)). Project data from the tribal districts of Gadchiroli and Chandrapur of Maharashtra, highlighted that immunization coverage for pregnant women

⁹⁰ Assam, West Bengal, Bihar, Jharkhand, Odisha, Uttar Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Himachal Pradesh, Andhra Pradesh, Telangana, Tamil Nadu, Jammu Kashmir and Delhi

⁹¹ Andhra Pradesh, Assam, Bihar, Haryana, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh

witnessed a sharp decline as compared to pre-COVID uptake ([TATA Trusts, Gadchiroli, 2021](#)) ([TATA trusts, Chandrapur, 2021](#)).

Overall, ANC services saw a reduced uptake during the peak phases of the pandemic, which resumed in the subsequent unlocking phases. However, there is a limitation of data to understand the overall coverage of ANC services amidst the pandemic.



Data source: AMB dashboard

Figure 15: Percentage of pregnant women utilizing ANC in last three years

B. Continuity of Pradhan Mantri Matru Vandana Yojana (PMMVY)

PMMVY is the direct benefit transfer (DBT) scheme, targeted towards pregnant and lactating women to encourage improved health seeking behaviour ([MoWCD, n.d.](#)). Table 22 provides compilation of documents reviewed under this domain.

Table 22: Documents included in this review on provision of maternity benefits under PMMVY amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, Key variables	Key findings	Evidence strength
1.	Rapid assessment social protection and relief measures COVID-19 response Andhra Pradesh Round 1: 24 April – 8 May, 2020 (UNICEF, 2020)	Cross sectional, Andhra Pradesh	PMMVY beneficiaries, service provision	April-May 2020 Rural Andhra Pradesh- 56.0% GPs reported providing benefits of PMMVY Sample size: 26 Gram Panchayats from 13	★★

				districts	
2.	Monitoring POSHAN Abhiyaan during the COVID-19 pandemic in Rajasthan – 2020 (IdInsight, 2021)	Cohort, Rajasthan	PMMVY, Rajasthan	May 2020 16.0% received- PMMVY benefits Sample size: 1140	★★★
3.	Report on assessment of essential nutrition services in Chhattisgarh during second wave of COVID-19 pandemic (UNICEF, 2021)	Cross sectional, Chhattisgarh	Respondents: Field functionaries, growth monitoring provision	May-June 2021 89.0% of respondents confirmed providing PMMVY cash benefits Sample: 14 DPOs, 30 CDPOs and 45 Lady Supervisors	★★
4.	Continuity of service tracking, UNICEF (PoshanCovid19.in)	Dashboard, India	PMMVY	Dec 2021 Functional in all 14 UNICEF Monitored states. ⁹²	NR

As documented in Table 22, 3 documents and one dashboard were reviewed to understand the impact of pandemic on continuity of PMMVY services. After initial disruptions in May-June 2020, PPMMY had resumed in all 14 UNICEF monitored states ([PoshanCovid19.in](#)). As of May 2020, during the initial phase of pandemic, only 56.0% GPs from the state of Andhra Pradesh ([UNICEF, 2020](#)) and 16.0% beneficiaries from Rajasthan availed the benefits ([IdInsight, 2021](#)). During the months of May-June 2021, up to 89.0% of field functionaries in the state of Chhattisgarh reported providing the PMMVY benefits to the beneficiaries. However, there is paucity of national level data in public domain on the coverage of PMMVY.

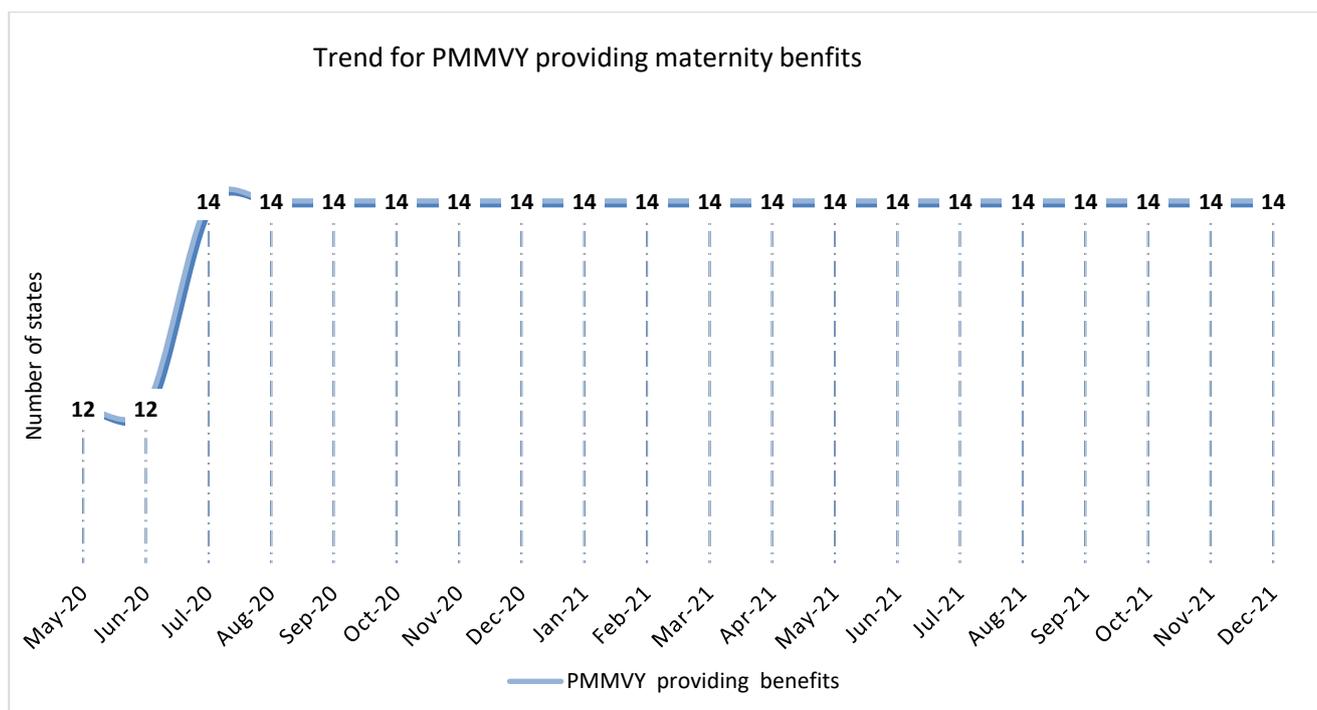


Figure 16: Trend for PMMVY providing maternity benefits

⁹² Assam, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Telangana, Odisha, Uttar Pradesh and West Bengal

4.3.2 WASH (water, sanitation and hygiene) scenario amidst COVID-19

WASH is a key nutrition sensitive intervention that can have an impact on health and nutritional wellbeing. Poor WASH practices may increase the incidence of communicable diseases and thus affect the nutritional status of the population. Good WASH practices, that are consistently applied, serve as barriers against human-to-human transmission of the COVID-19 virus. Table 23 provides compilation of documents reviewed under this domain.

Table 23: Documents included in this review on WASH scenario amidst COVID-19

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, Key variables	Key findings	Evidence strength
1.	Water, Sanitation, and Hygiene Practices and Challenges during the COVID-19 Pandemic: A Cross-Sectional Study in Rural Odisha, India (Vauza et al., 2021)	Qualitative study, Odisha	General population, WASH during COVID	May-July 2020 Positive change in hand washing, challenge in buying soap, and/or getting water for handwashing	★★★
2.	COVID-19 response and WASH lessons learned in India (UNICEF, 2021)	Narrative Report, India	General population, WASH interventions by UNICEF	It took time to integrate COVID appropriate WASH practices into Covid response protocol led by Ministry of Health and Family Welfare. Reaching people with disabilities proved a challenge. Also, closure of schools and Anganwadi Centres was a challenge to promote WASH awareness.	★★★
3.	WASH during COVID-19 pandemic in India (Kalpana et al., 2021)	Narrative report, India	General population, Water availability	Repeated handwashing was difficult to practice due to water scarcity.	★★
4.	Baseline study for vision healthy India project: fight against the silent emergency in Delhi (Save The Children, 2021)	Cross sectional, Delhi	General population, WASH, Hygiene	November 2020 70 percent women used soap and water to wash hands at four or more critical times. Sample size: 23 pregnant women and 15 lactating women	★★★

As discussed in Table 23, 4 documents were reviewed to understand the WASH practices amidst the pandemic. Sporadic data from Odisha highlighted that positive handwashing practices including increase in frequency, use of soap/ sanitizer, improved handwashing technique were witnessed amidst the pandemic. Along with this, changes in household cleaning practices like cleaning the house more frequently, use of detergent/ disinfectants were also evident. However, in order to engage in such positive and essential behaviour, the access to water and soap should be prioritized. But small-scale data highlighted pre-existing challenges with access to water, as

water scarcity was recorded in study districts of Chhattisgarh ([UNICEF, 2021](#)) and other reviews ([Kalpana et al., 2021](#)).

Similarly, in urban slum settlements of Delhi, only 60.0% of population had access to safe drinking water and 50.0% faced water quality issues. However 70% women reported to using soap and water for handwashing at critical times, though this was not enumerated specifically in COVID context ([Save The Children, 2021](#)). Though the pandemic may have induced some positive WASH behaviour but the inequities with respect to water access needs to be addressed even more amidst the pandemic. Sustaining this positive behaviour may have the potential to reduce many communicable diseases and thus also prevent future health emergencies.

4.3.3 Social and behaviour change communication (SBCC) and technological innovation for health and nutrition promotion during the pandemic

SBCC is an important strategy to improve nutrition and health outcomes across the continuum of care. Community engagement is an essential component of SBCC services, which was impacted due to COVID-19 pandemic. Table 24 provides compilation of documents reviewed under this domain.

Table 24: Documents included in this review on SBCC for health/ nutrition promotion during the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, Key variables	Key findings	Evidence strength
1.	A hidden cost: The pandemic's impact on nutrition (Accountability Initiative, 2020)	Narrative report, India	General population Health check-ups, counselling	In lockdown- Health check-ups and counselling, VHSNDs and Community-based events no longer functional due to AWC closure, leading to disruption in face-to-face individual and group counselling	★★★
2.	COVID-19 disrupted provision and utilization of health and nutrition services in Uttar Pradesh, India: Insights from service providers, household phone surveys, and administrative data (Nyugen et al., 2021)	Cohort, Uttar Pradesh	FLW, VHSND	December 2019 and July 2020 FLWs conducting VHSND reduced by 7.0% from December 2019 (96.2%) to July 2020 (89.1%) (p value <0.001)	★★
3.	Innovation and adaptation (UNICEF, n.d)	Newsletter, India	Nutritional status tracking	Using RapidPro for tracking of nutritional status of pregnant women, lactating women and malnourished children	NR
4.	Response to COVID-19 by the Anganwadi ecosystem in India (KPMG, 2020)	Narrative report, India	Technology: IEC and education	Continuing education in lockdown AWW -educational exercises recorded on smartphones	★★

As discussed in Table 24, 3 documents and a data dashboard were reviewed to understand the SBCC strategy amidst the pandemic. During initial phase of the lockdown, AWC were not functional, Village Health, Sanitation and Nutrition Days (VHSND), counselling and community events were not conducted. Initiatives were undertaken to utilize the digital platforms for sharing information in the absence of community events. Government of Maharashtra launched Tarang Suposhit ([Tarang Suposhit Maharashtra, n.d.](#)), a digital platform equipped with facilities like a helpline number, a broadcast call and a WhatsApp chatbot. The helpline number (8080809063) answered questions about breastfeeding, nutrition and childcare. The platform also shared information through photos, videos, short films and recipes for healthy and nutritious dishes. The content from this platform complemented the efforts of the Anganwadi workers in reaching out to community members through telephone calls and WhatsApp. Similarly, Government of Odisha used Tiki Mausi for generating awareness on COVID appropriate behaviour and nutrition. A remote sensitisation and supportive supervision mechanism was established by the Department of Social Welfare, Government of Assam. The aim was (i) to build capacities of AWWs on service delivery in COVID context; (ii) to intensify supportive supervision and (iii) to streamline reporting on essential nutrition services including MIYCN counselling; growth monitoring; CMAM; IFA supplementation among out-of-school adolescent girls. The state had conducted numerous state level capacity building sessions. Services prioritised as 'essential services' were in line with the numerous state directives issued in context of COVID. These included monthly growth monitoring and screening for malnutrition; care for children with SAM; weekly Iron and Folic acid supplementation among adolescent girls; and MIYCN counselling for pregnant women, lactating mothers, and mothers of children below 2 years. Similarly, tracking of nutritional status of pregnant and lactating women along with malnourished children via RapidPro, in Odisha amidst the double burden of cyclone and COVID pandemic was noteworthy.

Government of Gujarat similarly used multiple digital platforms and Umbare Anganwadi digital platform to reach out to field level functionaries and last mile stakeholders by virtually celebrating community-based events during COVID-19 lockdown and after ([UNICEF Innovations and Adaptations](#)).

Key highlights on impact of pandemic on underlying determinants

- Profound loss of livelihood, reduction in income added with price fluctuations during pandemic affected the food consumption patterns.
- Government and developmental organizations took initiatives to provide WASH services at various institutional facilities.
- Community events disrupted during the pandemic, however multiple digital and social media platforms were used for behaviour change communication pertaining to nutrition and COVID appropriate behaviour. But lack of empirical evidence to understand use of digital platforms to provide SBCC amidst the pandemic.
- Only limited data was available with respect to safe food preparation and handling practices amidst the pandemic.

- Paucity of latest national-level data to understand the ANC/PNC coverage during pandemic. Paucity of data in public platform on PMMVY coverage during COVID.



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CHAPTER 5: Impact of COVID-19 on enabling determinants of nutrition

The enabling determinants of nutritional outcomes include policy environment, resource allocation towards interventions and strategies that have direct and indirect impact on nutrition. The socio-cultural norms that affect community's nutrition behaviour is also a crucial determinant of nutritional outcomes. Thus, it is essential to understand how these determinants have been impacted by the COVID-19 pandemic.

5.1 Governance and policy environment

In this section, new initiatives amidst the pandemic that were rolled out to cope with the population level nutritional challenges are discussed.

5.1.1 Initiatives/ programmes launched amidst the COVID-19 pandemic

New initiatives were launched during the COVID-19 pandemic to adapt with the changing health and nutrition scenario as well to address to the emerging concerns. Table 25 provides compilation of documents reviewed under this domain.

Table 25: Documents included in this review on initiatives/ programmes launched amidst the COVID-19 pandemic

No	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings
1.	Local food systems and COVID-19; A glimpse on India's responses (FAO, 2020)	Narrative report, India	General population, food distribution	During pandemic 17 item food kits distributed to all (Kerala); Community kitchen set up-district administration; Distribution via local administrations
2.	Rice fortification-Pilot project (Ministry of Consumer Affairs, Food & Public Distribution, 2021)	Press Release	Rice fortification	August 2021 247 thousand MT of fortified rice: distributed in 7 states
3.	Millet Mission, (Government of India, 2021)	Press release, India	NFSA beneficiaries, millet inclusion	Incorporating millet in food basket for NFSA beneficiaries. NITI Aayog signed a Statement of Intent with United Nations World Food Program (WFP) to mainstream millets and support India to take lead globally in knowledge exchange using the opportunity of 2023 as an International Year of Millets. The partnership will further aim at building resilient livelihoods for small-holder farmers and adaptation capacities to climate change and transforming food systems.
4.	Food Security Response during COVID-19 and PDS Best Practices in some States/UT (WFP, 2021)	Narrative review, India	TPDS beneficiaries, One Nation One Ration Card (ONORC) and rice fortification	ONORC: to aid access of PDS from any FPS: accelerated amidst pandemic for migrant workers, active in 32 states/UT Distribution of fortified rice through food safety schemes to 15 states ⁹³ (1 district each): ongoing pilot project

As presented in Table 25, 3 new initiatives related to nutrition were launched by the Government of India or the State Governments. During the first phase of lockdown a large section of migrant workers were devoid of their TPDS benefits, so, in order to tackle this problem, One Nation One Ration Card (ONORC), (first launched in 2018), was given a major push amidst the pandemic thus helping the PDS beneficiaries to avail ration at subsidised price from any FPS across the county ([WFP, 2021](#)). Also, amidst the pandemic, under the National Millet Mission, millet was introduced in food baskets to improve the dietary diversity of NFSA beneficiaries and build resilient

⁹³ Andhra Pradesh, Kerala, Karnataka, Maharashtra, Odisha, Gujarat, Uttar Pradesh, Assam, Tamil Nadu, Telangana, Punjab, Chhattisgarh, Jharkhand, Uttarakhand & Madhya Pradesh

livelihoods for small-holder farmers and adaptation capacities to climate change and transforming food systems ([Government of India, 2021](#)). The pandemic period witnessed, at the state level, some new initiatives to address food security among the population.

Also, food kits were distributed in Kerala to all people irrespective of their income status. An increased focus at the central level on distribution of micronutrient fortified rice through all food safety nets was a key initiative during the pandemic ([Ministry of Consumer Affairs, Food & Public Distribution, 2021](#)). Systematic documentation and implementation of these initiatives, strengthening them and integrating them with the ongoing interventions have the potential to address nutritional needs of the population and could be key to preparedness for future nutritional emergencies.

5.1.2 Transition from POSHAN Abhiyaan to POSHAN 2.0

Taking lessons from POSHAN Abhiyaan, POSHAN 2.0 was announced in February 2021. The objective of this initiative was to implement a comprehensive, unified strategy to strengthen nutritional service delivery and outreach. The aim was to address malnutrition in the country, with renewed focus on developing practices that nurture health, wellness and immunity ([PoshanAbhiyan.gov, n.d.](#)). Streamlined guidelines for implementation of POSHAN 2.0 and Saksham Anganwadi Karyakram were issued in January 2022 ([MoWCD, 2022](#)) ([detailed guidelines](#) were released on 1st Aug 2022). This centrally sponsored scheme seeks to address the challenges of malnutrition in children, adolescent girls, pregnant women and lactating mothers through a strategic shift in nutrition content and delivery. By creation of a convergent eco-system, the goal is to develop and promote practices that nurture health ([MoWCD, 2022](#)). Also, digital infrastructure under the “Poshan Tracker” was rolled out by Ministry of Women and Child Development (MoWCD) on 1st March 2021 ([Poshan Tracker, n.d.](#)). Poshan tracker is aimed to provide last mile tracking for service delivery, malnutrition detection; better convergence. This is expected to strengthen and bring about transparency in nutrition delivery support systems. However, guidelines are not yet available in public domain.

5.2 Resource allocation towards nutrition services during the pandemic

Resource mobilization is an essential component of dealing with any emergencies. This section discusses how, financial allocations, human resources and technology adapted to the changing nutrition scenario and service delivery during the pandemic.

5.2.1 Financial allocation to nutritional interventions and services during COVID-19

Adequate financing is one of the fundamental blocks of health and nutrition system. There has been a variation in fund estimation and allocation for different nutrition programs in past two years of the pandemic ([Kapur et al., 2022](#)) ([Accountability initiative, 2021-22](#)). Table 26 provides compilation of documents reviewed in this domain.

Table 26: Documents included in this review on financial allocation to nutritional interventions and services during COVID-19

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Key variables	Key findings
1.	Public expenditure review for nutrition In Jharkhand (Save The Children, 2020)	Jharkhand, Narrative report	Expenditure across nutrition programs	Underutilisation of allocated funds (SNP-ICDS, PMMVY, IFA for children) resulted in a decline in the budgetary allocation in recent years
2.	Impact of COVID-19 on child nutrition in India: What are the budgetary Implications? (CRY, 2021)	Narrative report, India	Financial allocation, fortification	FY 2020-21, recommended additional grants of ₹7735 crore to states for increased spending under on fortification under SNP
3.	ICDS (pre budget) Budget brief (Accountability Initiative, 2021-22)	Narrative report, India	Budgetary allocations in ICDS	In FY – 2020-21 Revised Estimate (RE), funds allocated to ICDS lower Res for FY 2019-20; Funds released for SNP higher FY 2020-21
4.	India under spends on nutrition, new nutrition programme yet to be implemented (Kapur et al., 2022)	Narrative report, India	Budget for nutrition programs	Stagnant allocations for nutrition programs over the years; budgetary allocation significantly lower than requirement; fund approved for SNP 2021-22 less than estimated
5.	Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) (Pre-Budget) (Accountability Initiative, 2022)	Narrative report, India	Pre-budget analysis	FY 2021-22, funds allocated for PM POSHAN: lower than previous year and demand; Fund for food procurement was less than previous year
6.	Budget brief: Saksham Anganwadi and POSHAN 2.0 (Accountability Initiative 2022)	Narrative report	Pre-budget analysis	ICDS, POSHAN Abhiyaan allocation (2021-22) less than 2019-20; For FY 2022-23 Budget Estimates (BEs), allocations for Saksham Anganwadi and POSHAN 2.0- higher than FY 2021-22 Revised Estimates.
7.	Budget brief: Food Subsidy and National Food Security Allowance (Accountability Initiative, 2022)	Narrative report	Financial allocation, NFSA	Allocations for the food subsidy scheme in FY 2022-23 Bes less than previous RE; Despite allocation for additional food grain under PMGKAY
8.	Improving nutrition budgeting in health sector plans: Evidence from India's anaemia control strategy (Saini et al., 2022)	Narrative report	Financial allocation, AMB	Allocation for AMB increased in last three years but still not up to the requirement; 2021-22: low allocation (4.0%) for BCC and capacity building

As presented in Table 26, 8 documents were reviewed to understand the financial allocation to nutrition programmes amidst the pandemic. When compared to pre-COVID times (Financial Year 2019-20), funds allocated for ICDS reduced by 3.0% but for initiatives like Supplementary Nutrition Programs (SNP), allocation increased by 3.0% in 2020-21 ([Accountability Initiative, 2021-22](#)). For FY 2021-22 funds allocated for PM-POSHAN (11.0% less), ICDS (3.0% less) were lower than previous year. In 2021-22, for SNP, funds approved were

lower than estimated (41.0% allotted) than previous year. For AMB, allotment was 18.0% higher than year's (2020-21) allotment.

Estimates of 2022-23, were higher for Saksham Anganwadi and POSHAN2.0 but lower for National Food Security Act than previous year's estimate ([Accountability Initiative 2022](#)). At state level, budget cuts were evident as a result of poor spending. In Jharkhand, underutilization of funds for FY 2020-21 was reported for SNP-ICDS, PMMVY and IFA for children resulting in lower allocation for subsequent years. However, an overall stagnant trend in allocation for nutrition programs has been observed for the last few years at the national level. Also, to ensure efficient budget utilisation, transparency in budget data, avoiding delays in financial flow and addressing staff shortages were recommended. The allocation towards critical components like capacity building, IEC/ SBCC, research, and strengthening of services need to be strengthened.

5.2.2 Enabling human resources for COVID-19 appropriate service delivery

Frontline workers were real warriors during the unprecedented times of COVID-19. Despite the fear of contracting the virus, they adapted to the changing pandemic environment. They faced many challenges but, managed to maintain the service provision for the beneficiaries. Table 27 provides compilation of documents reviewed under this domain.

Table 27: Documents included in this review on enabling human resources for COVID-19 appropriate service delivery

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	FLW during COVID-19 pandemic (Accountability Initiative, 2020)	Data dashboard, National	Front Line Worker (FLW), COVID reporting	March 2020 FLW: door-to-door screening Monitoring of positive cases and reporting of new arrivals	NR
2.	RMNCAH-N Services During COVID-19: A spotlight on India's policy responses to maintain and adapt essential health services (PATH, 2021)	Narrative Report, India	FLW adaptation to pandemic	Healthcare service- via tele-consultation Essential commodities such as Calcium, Zinc -home deliveries	★★★
3.	Effect of COVID-19 on programs aimed at improving health and nutrition status of women and children in Rajasthan (Development Solutions Inc, 2021)	Qualitative study, Rajasthan	FLW, HBYC program	Lockdown Fear of transmission-households did not permit ASHAs to enter their homes	★★
4.	COVID-19 disrupted provision and utilization of health	Cohort, Uttar Pradesh	FLW, COVID appropriate behaviours	December 2019-July 2020 Providing service at doorstep (40.0%-90.0%)	★★

	and nutrition services in Uttar Pradesh, India: Insights from service providers, household phone surveys, and administrative data (Nyugen et al., 2021)			Maintaining social distance (80.0%) Using of PPE (40%-50%) Tele-communication (20.0%) Sample: 313 FLWs	
5.	Evidence based response to early childhood development during the COVID-19 crisis (Dalberg, 2022)	Cross sectional, 11 states ⁹⁴	Frontline workers (FLWs),	September 2020-February 2021 Parents: highlight importance of AWWs in enabling positive caregiving outcomes in both children and parent's lives FLW: 90.0% more tired, higher levels of stress Sample size: 10112	★★★

As documented in Table 27, 5 documents were reviewed to understand the human resource adaptation amidst the pandemic. Enabling human resources for COVID appropriate behaviour was essential during the pandemic and thereafter. Initially there was a lot of apprehension and fear of virus transmission among the beneficiaries pertaining to home visits of ASHAs while they were providing door to door delivery of zinc, Oral Rehydration Solution (ORS), calcium [\(PATH, 2021\)](#). The frontline workers (FLWs) adopted the recommended precautions to prevent the spread of the virus. COVID appropriate practices like maintaining social distance, minimising contact and wearing Personal Protective Equipment (PPE) kits were followed during service delivery [\(Nyugen et al., 2021\)](#). However, due to constant fear of virus transmission and increased workload FLWs reported higher level of tiredness and stress [\(Dalberg, 2022\)](#). Owing to mobility restrictions, novel innovative technology like telecommunication was also used for the purpose of health consultation and counselling [\(PATH, 2021\)](#). Thus, the learnings from the pandemic can help in developing protocols for disaster preparedness, so that essential health and nutrition services could promptly adapt during the time of crisis.

5.2.3 Data monitoring amidst the COVID-19 pandemic

This report highlights the lack of available data to properly assess the impact of the COVID-19 pandemic on the nutritional status of children, adolescents and adults. There is a need for a robust, real-time surveillance mechanism to enable the detection of changes in the nutrition status of children, adolescents and adults during such health emergencies. With respect to specific programs there is a paucity of data available to monitor and track the most recent developments in delivery of MDM, facility-based management of SAM, along with micronutrient supplementation services like (IFA, vitamin A and calcium supplementation). Also, availability of real time data for the status of fortification services is limited. To assess and fully understand the long-term impact of COVID-19 on nutrition in India there is a need for more granular and longitudinal assessments on dietary intakes, nutritional status and health and nutrition service provisions.

⁹⁴ Andhra Pradesh, Assam, Bihar, Haryana, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh

5.3 Norms (gender and equality) that may impact nutritional scenario during the COVID-19 pandemic

Gender and social inequalities in childhood may hinder a child in achieving its full potential. These become more acute during crisis and disasters. Disparities in terms of diet intake, education, access to health care, are all exacerbated in vulnerable sections of the population. Table 28 provides compilation of documents reviewed to understand the impact of pandemic on social norms.

Table 28: Documents included in this review on norms that may impact nutritional scenario during the COVID-19 pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Impact of COVID-19 pandemic on adolescent health in India (Kumar et al., 2020)	Narrative review, India	School dropout, gender gap in education	Increase in school dropouts; interrupted learning; worsening gender gap in education	★★★
2.	Workers in the time of COVID-19 (ActionAid, 2020)	Cross sectional, 19 states ⁹⁹	Food insecurity, women	May 2020 Decreased access to food; Women in agricultural labour lost job (81.0%) as compared to men (74.8%) Sample size: 11,530	★★★
3.	How is the hinterland unlocking? Findings from 2 nd round of survey (Aga Khan Rural Support Program, 2020)	Cross sectional, 11 states ¹⁰⁰	Women, workload	June-July 2020 Post lockdown: increase in household work for women Sample size: 4835 Households	★★
4.	Impact of COVID-19 pandemic on adolescent health in India (Kumar et al., 2020)	Narrative review, India	Adolescent, Education, violence, mental health	Vulnerable population: loss of education and services affected; socially isolated people were prone to violence and mental distress; Risk of child labour increased	★★★
5.	Learning in times of lockdown: how COVID-19 is affecting education and food security in India (Alvi et al., 2020)	Narrative report, India	Women, Social and gender vulnerabilities	Increased food insecurity among urban and rural poor: School closure resulting in more dropouts among girls Threat of early and falling into cycle of malnutrition	★★★
6.	State of working India 2021 (APU, 2021)	Cross-sectional, India	Women, Gender and social gap in employment	March-December 2020 Women faced employment loss, more likely to not return to work; Lower caste workers	★★

				faced increased job loss, more likely to return to work.	
7.	An assessment of socioeconomic impact of COVID-19 pandemic in India (Aneja et al., 2020)	Narrative report, India	Women, Domestic abuse	Post lockdown increase in domestic abuse against women	★ ★ ★
8.	Impact of COVID-19 on women in low-income households India (Dalberg, 2021)	Cross sectional, 10 states ¹⁰²	Women, household chore, unpaid care work	November 2020 Increase in household chores: Women (47.0%) > men (43.0%) Increase in unpaid care work: women (41.0%) > men (37.0%) Loss of work rural men (32.0%) < rural women (41.0%) Sample size: 14910 women, 2340 men	★ ★ ★
9.	Inequality kills India Supplement 2022 (OXFAM India, 2022)	Narrative report, India	Girl child, marriage	During pandemic Increase in child marriages	★ ★ ★
10.	Women's well-being during a pandemic and its containment (Bau et al., 2022)	Cross sectional, 6 states ¹⁰³	Women, Food security	August 2020 Containment correlates with reductions in food security (p<0.10) and female mental health (p<0.05) Sample Size: 1500 households	★ ★ ★
11.	Impact of COVID-19 on household food insecurity and interlinkages with child feeding practices and coping strategies in Uttar Pradesh, India: a longitudinal community-based study (Nyugen, 2021)	Cohort, Uttar Pradesh	General population, household food security	December 2019- August 2020 21.0% household were not food secure before pandemic which increased to 80.0% during the pandemic (p<0.001) Non-availability of funds to buy food was reported in 59.0% of household 78.4% household reported unemployment/loss of income.	★ ★
12.	The State of India's Poor: Volume 1, April – June 2020, Social Group: Dalit (COLLECT: Community-led Local Entitlements)	Cross sectional, 10 states ⁹⁵	Schedule Caste children and women, social inequality	April-June 2020: Limited access to online education.	★ ★

⁹⁵ Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, NCT of Delhi, Odisha, Rajasthan, Tamil Nadu, Uttar Pradesh

[and Claims Tracker, 2020](#))

Increase in child abuse and domestic violence against women.

As documented in Table 28, 12 documents were reviewed to understand how gender issues and inequality might have exacerbated the impact of COVID-19 on nutritionally vulnerable sections of the population. Women were disproportionately affected during the pandemic. While women had a higher risk of losing their livelihood ([ActionAid, 2020](#)) ([APU, 2021](#)), some studies have shown increase in household and unpaid work for women ([Aga Khan Rural Support Program, 2020](#), [Dalberg, 2021](#)). Different studies reported higher school dropout among girls and increased risk of child marriage during the pandemic ([OXFAM India, 2022](#), [Alvi et al., 2020](#), [Kumar et al., 2020](#)). The pandemic period also saw increased social isolation and domestic violence against women ([Aneja et al., 2020](#), [Bau et al., 2022](#), [COLLECT: Community-led Local Entitlements and Claims Tracker, 2020](#)).

Key highlights on impact of pandemic on enabling determinants

- New initiatives were launched both at state and national level amidst pandemics. One the national level, taking lessons from POSHAN Abhiyaan, POSHAN 2.0 was announced in February 2021. Along with this, ONORC was given a major push and National Millet Mission was also launched to enhance the diet diversity of NFSA beneficiary. At the state level, many smaller initiatives like setting up of community kitchen, providing free meals bought some respite from the pandemic-induced food insecurity among the vulnerable communities.
- Financial allocations to nutrition programs remained almost stagnant despite the added load of pandemic and changes in modality of service provision. However, despite the availability of data on fund allocation, there is a lack of data in public domain with respect to fund utilization under different nutrition programs.
- Women were disproportionately affected by the pandemic with higher risk of job loss along with the added burden of unpaid care work and household chores.
- Adapting to the pandemic situation, technology helped in better delivery of essential health and nutrition services. The adaptation of human resource (FLW) to provide COVID appropriate service delivery was commendable.



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CHAPTER 6: Key global highlights

Improving nutrition is essential to global progress and integral to achieving the sustainable development goals. One of the biggest global challenges is to tackle the malnutrition in all its forms. Poor diets and resulting malnutrition are unacceptably high across the world, creating one of the world’s greatest current societal challenges. The pandemic has brought to light, the need for bolder, sustained and better coordinated action through inter-sectoral approach. Global reviews covered in Table 29 elaborates upon the potential increasing impact of pandemic on various domains and factors affecting the nutrition scenario.

Table 29: Documents included in this review on key global highlights amidst the pandemic

No.	Title (Author/Organization, Year of Publication) hyperlinked	Type of study and locale	Population, key variables	Key findings	Evidence strength
1.	Child malnutrition and COVID-19: The time to act is now (Fore et al., 2020)	Opinion piece children, LMIC	Children, food security	Pandemic likely to impact nutritional status of children, due to deteriorating quality of diets, disruptions in nutrition and other essential services, socioeconomic shocks.	NR
2.	Combatting COVID-19's effect on children	Narrative review,	Children, Poverty	Children in poverty-25.0% Children without access to fresh	★★★

	(OECD, 2020)	Organisation for Economic Co-operation and Development (OECD) countries ⁹⁶	and dietary intake	fruits and vegetables and/or at least one meal per day that includes beef, poultry, fish, or a vegetarian equivalent- 10.0%. Overall- 89.0% internet access. But Low-income countries – 78.0% World children- affected by school cancellations-90.0%.	
3.	COVID-19: Missing more than a classroom: the impact of school closures on children’s nutrition (UNICEF, 2021)	Narrative review, Global	General population, Poverty and food security	COVID-19- lost income and remittances- major driver of food insecurity- 135 million individuals becoming food insecure including 74 million children Ethiopia, in April-May 2020, 23.0% households ran out of food (30.0% of the poorest quintile’s household as compared to 15.0% of the wealthiest quintile’s HH).	★ ★ ★
4.	Impact of COVID-19 on snacking habits, fast food and alcohol consumption: A systematic review of evidence (Bakaloudi et.al, 2021)	Systematic review, global	General population, consumption pattern	Decrease in fast food consumption, food ordering Increase in snacking and alcohol consumption.	★ ★ ★
5.	Food Insecurity, Safety Nets, and Coping Strategies during the COVID-19 Pandemic: Multi-Country Evidence from Sub-Saharan Africa (Dasgupta et al., 2021)	Narrative review, sub-Saharan countries	General population, Income and nutrition	In Ethiopia job loss in pandemic- 13.0% (urban more than rural) also 55.0% either a decline/loss of income as a result of the outbreak In Kenya job loss reported by 5.4% respondents. Overall, Governments and international organisations providing financial and food assistance.	★ ★ ★
6.	Food security and COVID-19 (World Bank, 2021)	Narrative report, global	General population, food price	Domestic food price inflation in most countries Poorest countries witnessed a sharp increase in food prices in September 2021, reaching the highest level since start of pandemic.	★ ★
7.	Global monitoring report on financial protection on health	Narrative review, global	General population expenditure	8.0%-18.0% people undergoing COVID-19 tests reported lowering their expenditure on household	★ ★ ★

⁹⁶ The OECD’s 38 members are: Austria, Australia, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States

	2021 (WHO, 2021)		e	needs (such as food, housing, and utilities) in order to cope with connected expenses.	
8.	The state of food security and nutrition in the world (FAO, 2021)	Narrative report, global	General population, Hunger and food security	In the first year of pandemic: hunger affected the population: Africa (21.0%), Asia (9.0%), Latin America and the Caribbean (9.1%).	★ ★ ★
9.	Variations in the financial impact of the COVID-19 pandemic across 5 continents: A cross-sectional, individual level analysis (Ketan et al., 2022)	Cross sectional study, 5 continents ⁹⁷	Adults (37-70 years), Financial impact of pandemic	August 2020- September 2021 Financial impact on Low- and Middle-Income Countries (LMICs) was 3 times more than High Income Countries.	★ ★ ★
10.	Global insights of consumer experiences during the COVID-19 (Meara et al., 2022)	Cross sectional, global	Adults, Food environments, food security	April 2020 Decrease in the following food-related behaviours: Less eating out -91.3%, Leaving the house for grocery shopping-78.9% Increase in cooking at home-75.8%	★ ★ ★
11.	The FAO Food Price Index all-time high in March (FAO, 2022)	Data dashboard, global	Food price	2022 12.6% increase in food price, highest since 1990.	NR

As shown in Table 28, 10 documents and a data dashboard were reviewed to understand the impact of COVID-19 pandemic on the nutrition scenario globally. Global trends show changes in consumption patterns of population across different countries ([OECD, 2020](#)). On one side, increased consumption of alcohol (France, Australia, Poland, China, New Zealand) and frequency of snacking (France, Poland, Brazil, Spain) was reported ([Bakaloudi et.al, 2021](#)). On the other side, food security continued to be a major concern for some African countries (highest in Chad, Ethiopia, and Uganda) ([UNICEF, 2021](#)). With the loss of jobs and livelihood at the global level, low-income countries were financially impacted three times more than the high-income countries ([Ketan et al., 2022](#)). Consequently, expenditure on household needs witnessed a decline during pandemic ([WHO, 2021](#)), the education was also hampered as result of school closure ([OECD, 2020](#)). Loss of income combined with systemic disruption of classroom education has the potential to increase school drop-out, induce food and nutritional insecurity among children, especially from the low-income settings. The pandemic and its impact on different facets of nutrition may overturn the years of progress on poverty, nutrition and education.

⁹⁷ Asia, Africa, Europe, South America, North America, and the Middle East



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CHAPTER 7: Recommendations

Recommendations for a resilient health and nutrition environment to cope with existing and future emergencies have been elaborated below. These recommendations are developed on the basis of the key observations presented in the preceding chapters of the document and are a compilation of all the documents reviewed as part of this project.

1. The pandemic called for quick decision making with inter-departmental coordination, so the need to sustain leadership for food and nutrition security within the Prime Ministerial and Chief Ministerial Offices and District Magistrates and Panchayats to ensure coordination, monitoring and adequate financing of nutrition specific and nutrition sensitive interventions.
 - a) High powered leadership to look into any signs of worsening nutrition situation post pandemic through regular review of administrative data.
 - b) Enhance multisectoral interventions, with focus on ensuring food security, coverage and continuity of essential health and nutrition services.
 - c) Ensure prioritization and adequate financing for nutrition in post-Covid scenario, with aim to increase outreach among vulnerable communities.
2. Since the paucity of data to completely understand the pandemic was a major concern, strengthening the data systems available in the country to quickly (real-time) and effectively (quality) capture changes of nutritional status amidst any new possible disaster or crisis to be prioritised.

- a) Improving the quality and routine update of regular administrative data along with focus on national nutrition surveys (season specific data collection) for better policy and program decisions.
 - b) Real-time nutrition data collection and setting up of a nutrition surveillance system.
 - c) Monitoring and data driven decision making using various national level data trackers like HMIS, Poshan Tracker.
 - d) Integration of data collected under different departments to reduce duplication.
 - e) Regular data reviews to study the trends in coverage, continuity, and quality of interventions. This would help in identifying areas requiring corrective actions with respect to quality of services and tracking their last mile delivery.
3. As the pandemic caused some disruption in services, there is a need to facilitate and support uninterrupted, universal, timely and high-quality implementation and coverage of all essential nutrition specific services (affected due to pandemic) in all parts of the country.
- a) Ensuring continuity and coverage of the nutrition services at the anganwadi centres, schools, nutrition rehabilitation centres, and optimally operationalizing village health sanitation and nutrition days (VHSND).
 - b) Ensuring timely distribution, improving the quality of supplementary nutrition programs as well as take-home rations.
 - c) Universal coverage of essential micronutrient supplementation programmes- IFA supplementation, calcium supplementation, deworming and biannual vitamin A supplementation program
 - d) Setting up and/or strengthening of effective logistic management information system for continuity of all nutrition services.
 - e) Due considerations to be given to reaching out to the most vulnerable (women, children and socio-economically impoverished population) and last mile delivery of these services.
4. To ensure recovery from the disruptions caused due to the pandemic, it is imperative to accelerate efforts to address food security, including dietary diversity and access to adequate micronutrients, primary health care, safe drinking water, environmental, household sanitation and address gender issues pertaining to women's education and delaying age of conception.
- a) Promoting the use of diverse, indigenous, nutrient rich foods in the supplementary feeding programs
 - b) Counselling and promotion of alternative recipes and nutrient dense local food items to meet the nutritional requirement during emergencies.
 - c) Promoting home and institution-based (school and anganwadi centre) kitchen gardens to promote dietary diversity.
 - d) Actively incorporating coarse cereals and pulses along with wheat and rice in TDPS to encourage dietary diversity and enhance nutritional quality of foods distributed under food safety nets
 - e) Due consideration to be given to gender sensitivity and equitable distribution and outreach of these interventions.
 - f) Exclusion errors in NFSA to be addressed to cover the vulnerable population especially during crisis situations.
5. To strengthen multisectoral approach and effective delivery of interventions under health, WASH, livelihood, agriculture, other social sectors along with their integration with mainstream nutrition programs amidst the COVID-19 pandemic.

- a) Aid in creating a supportive environment by devising policies for controlling the food prices in such emergencies, the shorter supply chain for local produce and farmers' cooperatives for promoting production and consumption of local produce.
- b) Role and importance of Krishi Vigyan Kendra (KVK) in ensuring supply and support for agricultural inputs has been reiterated in the pandemic. Lessons from these may be useful to strengthen farmer support organization at sub-district level to adapt to a similar situation of crisis.
- c) "Direct sale of produce to the consumer" model adapted in the pandemic may be promoted and supported so to be used in case of other emergencies.
- d) To ensure social safety nets and financial empowerment among the community, effective delivery of programs for livelihood generation or employment guarantee schemes like MGNREGA need to be strengthened and universalized to include migrant workers.
- e) The gender aspect of these programs need special attention, so is the outreach of these livelihood generation schemes to the vulnerable strata of the population.
- f) Close coordination between different sectors to be ensured through high level leadership.

6. The need for community participation and engagement in addressing the factors contributing to health and nutritional concerns has been highlighted in the pandemic.

- a) Risk Communication and Community Engagement (RCCE) to promote uptake of antenatal, postnatal, and early-childhood nutrition services and to promote positive practices by pregnant and postpartum women and caregivers of children under two years (e.g., maternal micronutrient supplementation, dietary diversity, breastfeeding, and overall maternal infant and young child nutrition (MIYCN) practices) during pandemic and emergencies.
- b) Special emphasis on BCC strategy for optimal food handling practices, WASH practices and issues of social and gender inequality will ensure holistic recovery from increased burden of malnutrition and COVID-19.
- c) Creating awareness among population to ensure uptake of catch-up immunization sessions may help in recovering from the missed doses of vaccines.

7. Devising strategies for adapting to COVID-19 guidelines and innovations in the service delivery mechanism.

- a) Developing innovative methods and protocols for disaster preparedness so that human resources can be better utilized during the times of crisis. For example, use of telecommunication for real time data entry for monitoring purposes and interpersonal counselling.
- b) Skill-building of the frontline workers on efficient interpersonal communication to address nutrition concerns across different population groups.
- c) Incentivising and protection of the human resources to quickly adapt to health and nutrition emergencies.
- d) Improving health infrastructure to cater to the growing needs to the population in case of health emergencies (e.g., PPE kits for FLWs).

8. Adequate financial allocations and better utilization of available funds to ensure delivery of high impact interventions to address the additional burden and accounting for change in service delivery modality due to the COVID-19 pandemic

- a) Ensuring adequate budgeting and utilization of funds allocated for nutrition programs.
- b) Provision of additional funds in to address additional load on health and nutrition services in case of similar health emergencies.

9. Promoting public private partnerships and engaging with community-based organization in addressing gaps in monitoring of nutrition scenario and nutrition service provisions especially during the pandemic.
- a) Role of private sector and community-based organizations in supporting the data collection and monitoring of key nutrition indicators was crucial. This may facilitate community mobilisation, and last mile service outreach during emergencies.
 - b) Handholding and capacity building of FLW while partnering with the private sector should be encouraged and is vital to efficiently deal with emergencies like the current COVID-19 pandemic.
 - c) Effectively mobilizing other community resources such as Panchayati Raj Institutions, Urban Local Bodies and community organisations like SHGs to support Government initiatives for nutrition during pandemic.

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