



NOURISHING WOMBS

Delivering an integrated package of maternal nutrition interventions in Andhra Pradesh and Telangana (India)

The study was carried out in partnership with the following organizations:



Amaltas Consulting Private Ltd.



Centre for Economic and Social Studies



National Institute of Nutrition

Nourishing wombs: Delivering an integrated package of maternal nutrition interventions in Andhra Pradesh and Telangana (India)

©United Nations Children's Fund (UNICEF),
New Delhi, India, 2017

Cover photo: ©UNICEF/UNI90466/Khemka

UNICEF
UNICEF House
73, Lodi Estate
New Delhi 110003
www.unicef.in
November 2017

Suggested citation: United Nations Children's Fund (UNICEF), 'Nourishing wombs: Delivering an integrated package of maternal nutrition interventions in Andhra Pradesh and Telangana (India)', *Nutrition Reports*, issue 10, UNICEF, New Delhi, India, 2017.

NOURISHING WOMBS

Delivering an integrated package of maternal nutrition interventions in Andhra Pradesh and Telangana (India)

Nutrition Reports, Issue 10, 2017

Disclaimer: This is a working document. It has been prepared to facilitate the exchange of knowledge and to stimulate discussion. The statements in this publication are the views of the author(s) and do not necessarily reflect the policies or the views of UNICEF. The designations employed in this publication and the presentation of the material do not imply on the part of the United Nations Children's Fund (UNICEF) the expression of any opinion whatsoever concerning the legal status of any country or area, or of its authorities or the delimitations of its frontiers. The text has not been edited or fact-checked to official publications standards and UNICEF accepts no responsibility for error.

CONTENTS

EXECUTIVE SUMMARY.....	1
REPORT.....	5
Introduction.....	6
Methodology.....	9
Results.....	12
Discussion.....	16
Conclusion.....	21
Literature cited.....	22
TABLES.....	25
APPENDICES.....	45
ACKNOWLEDGEMENTS.....	49





EXECUTIVE SUMMARY

INTRODUCTION

Maternal undernutrition is a major cause of poor maternal and fetal outcomes in India. The World Health Organization 2016 guidelines recommend balanced energy and protein supplementation, iron folic acid and calcium supplementation, deworming, weight gain monitoring and counselling on nutrition, family planning, and breastfeeding coupled with efforts to prevent and treat maternal infections as core nutrition interventions for pregnant women.

In India, the Integrated Child Development Services (ICDS) programme under the Ministry of Women and Child Development provisions for supplementary food as micronutrient-fortified food and/or energy dense take home ration for pregnant women and breastfeeding mothers at a unit cost of 9.5 Indian rupees in 2017 per women per day for 25 days a month. The supplementary food is intended to provide 600 kcal, 18–20 grams protein and half the recommended dietary allowance of nine essential micronutrients (MWCD, 2010, 2017).

The Ministry of Health and Family Welfare delivers iron and folic acid, calcium and deworming tablets, weight gain monitoring, bed nets (malaria-prone areas) and counselling to pregnant women as part of antenatal care services on monthly outreach and facility based antenatal contact points (MOHFW, 2010, 2013, 2014a, 2014b). However, uptake of these services has remained traditionally low.

In view of this situation, the state government of erstwhile Andhra Pradesh launched an integrated maternal on-the-spot feeding and counselling programme in 102 high-risk blocks in 2013, which replaced the dry ration with a hot cooked meal, 'One Full Meal', to be eaten daily at the anganwadi centre (AWC) for six

days a week throughout pregnancy and for six months after delivery over 25 days a month.

This platform was tapped for providing supervised micronutrient supplementation (iron and folic acid and calcium) and two counselling sessions per month. Based on the positive experiential evidence, the scheme was universalized in Telangana (Arogya Lakshmi scheme) in 2015 and in Andhra Pradesh (Anna Amrutha Hastham scheme) in 2017. In 2017, it was replicated in specific geographies in four other states – Chhattisgarh, Gujarat, Karnataka and Maharashtra.

Given the interest generated by the One Full Meal scheme, as it provides a platform to bundle various nutrition interventions, the State Governments of Andhra Pradesh and Telangana commissioned a study supported by UNICEF. The study objectives were to (i) evaluate on-ground implementation of components of this scheme (meal, health services and counselling) and the recorded Management Information Systems (MIS) data; (ii) seek stakeholder perspectives on what's working and what's not; and (iii) explore the potential of this scheme in improving the nutritional profile of the enrolled women.

METHODOLOGY

The study was cross sectional and entailed primary data collection and review of the scheme's MIS records for three years (2014, 2015 and 2016) and April–August 2017. Primary data collection was done through a randomized selection process and conducted between July 2016 and November 2016 on 360 pregnant and lactating women (of infants aged 0–6 months) per state, covering both rural and tribal ICDS projects.

The women were interviewed about their socio-demographics, receipt of services and

food insecurity experiences. Anthropometry (height, mid-upper arm circumference and weight) was measured using standard methods and equipment and maternal dietary diversity and 24-hour dietary recall evaluated on a subset of randomly selected 90 pregnant and 90 lactating women per state.

In addition, qualitative methods were used to gain insights into programme functioning from various stakeholders.

MIS system variables analysed included days of meal consumption of beneficiaries, pregnancy weight gain and haemoglobin change, birthweight and nutrition and health day sessions conducted. Primary and secondary (MIS) data were entered in CS-Pro version 4.1. Descriptive statistics were generated using SPSS version 12.

The study was conducted by UNICEF in collaboration with three agencies, Amaltas, Centre for Economic and Social Studies and National Institute of Nutrition, Hyderabad, and with oversight of a technical advisory group.

SUMMARY OF MAIN FINDINGS

The socio-demographic characteristics, from both rural and tribal regions, were reflective of underprivileged populations. The average age of respondents was ~23 years with slightly more pregnant (Andhra Pradesh 57 per cent, Telangana 51 per cent,) than lactating women. Nearly 45 per cent belonged to scheduled castes or tribes and 30–45 per cent reported being pregnant during their adolescence. The prevalence of maternal stunting was 8 per cent, wasting 15–22 per cent and severe wasting 4–12 per cent.

Only 25–40 per cent beneficiaries had enrolled on their own initiative, while

the majority were motivated by self-help groups or family members. Nearly all the beneficiaries perceived the meal to be adequate in quantity and taste.

Minimum dietary diversity (≥ 5 food groups) was documented in the vast majority of respondents (78–95 per cent), as also consumption of high quality foods, like eggs and milk (69–93 per cent). In comparison with Sundays when the meal was not provided, the computed dietary energy and protein intake was mostly higher on days when the scheme's meal was consumed. On-the-spot iron folic acid pill consumption was poor (14–23 per cent).

Nutritional counselling had been imparted to nearly all but only 40 per cent had received family planning counselling. Severe (Andhra Pradesh 2.5 per cent, Telangana 3.9 per cent) and moderate (Andhra Pradesh 10 per cent, Telangana 8.3 per cent) household food insecurity was uncommon, as assessed by raw scores. In general, socio-demographic characteristics, maternal nutrition, diet diversity, on-the-spot consumption of iron and folic acid, and counselling were poorer in tribal projects.

Data retrieved from the Management Information System of the three years indicated that the average days of consumption of the scheme's meal in a month ranged from 17 to 22.6 days, against the targeted 25 days. The estimated mean weight gain between the second and ninth month of pregnancy ranged from 8.3–9.7 kg. The mean haemoglobin level was low. The vast majority ($\geq 90\%$) of the anganwadi centres had organized at least one Nutrition and Health Day session during the past one month.

The resounding consensus from the qualitative survey of various stakeholders was that this is a useful programme, which

is well accepted by beneficiaries, with several aspects making it attractive, but some areas requiring improvements to enhance performance.

Some important suggestions for improvement included increased ownership of local groups for community audit/review of quality of services; ensuring basic cooking, water and sanitation infrastructure; availability of proper weighing scales; motivating beneficiaries who attend irregularly and women in high-risk pregnancy to avail themselves of the scheme; greater and functional linkage with health services, including counselling, and strengthening Nutrition and Health Day counselling sessions through mass and mid-media, with one dedicated session for newly wed women.

CONCLUSION

This study is one of very few formal operational evaluations of a large scale maternal nutrition programme, One Full Meal, employing mixed quantitative and qualitative techniques with due diligence for sampling methodology and quality assurance. The sample included functioning rural and tribal projects to enhance representativeness.

The primary objective was implementation research, namely to gain insights into ground realities of the functional scheme and stakeholder perspectives to provide relevant input for improving programme performance. The socio-demographic and maternal nutrition profile setting was similar to rural and tribal populations of several states of India; these findings may therefore be relevant for such states, if they are contemplating adopting and adapting the One Full Meal Scheme.

Stakeholders agreed that the One Full Meal Scheme is a useful programme,

which is well accepted by beneficiaries. Several aspects make it attractive but some areas require early improvement to enhance performance.

Social inequity is partially addressed through participation of some deprived and vulnerable beneficiaries, including those from scheduled castes and tribes. However, more efforts are required to reach the unreached and minimize default rates of recruited beneficiaries through counselling, peers, families and self-help groups.

It is likely that the scheme's meal enhanced maternal dietary quality and quantity; minimum dietary diversity was evident for the vast majority, as also consumption of high quality foods like eggs and milk.

The non-food components, particularly on-the-spot micronutrient consumption and family planning counselling, are functioning suboptimally at ground level and urgent, relevant and perseverant efforts are necessary to ensure efficient convergence with the health system and functionaries.

Efforts should also be considered to bundle other non-food components, such as malaria and fluorosis prevention, which are missing yet have indirect linkage with anaemia control. Newly wed young women out of the gamut of the programme may be considered for inclusion in high burden geographies.

Further, while plausible and consonant data can be retrieved from the Management Information System, its full potential for managerial aspects and individual beneficiary use needs further exploration. Stakeholders provided valuable insights and their suggestions merit action for improving programme performance.



© UNICEF/UNI162433/Biswas

REPORT

INTRODUCTION

Poor nutritional status of a woman before and during pregnancy is an important cause of child stunting. At least 25 per cent of child stunting is attributed to foetal growth restriction, defined as being term but small for gestational age (Danaei et al, 2016). Early studies (WHO, 1995) establish that pre-pregnancy weight (Odds Ratio 2.5) and attained weight at mid-pregnancy, i.e., week 20, (Odds Ratio 2.77) have independent and additive effects on foetal growth restriction. Other studies reconfirm that low maternal weight gain in first trimester of pregnancy has determinant effects on both length of gestation and on fetal length (Neufeld et al, 2004). These studies indicate the criticality of preconception nutrition and nutrition during pregnancy (especially first trimester) in nutrition programmes, which have traditionally remained child-centric.

In India, stunting affects ~47 million (38 per cent) children aged under five years (NFHS-4, 2015–2016). An estimated 5 million Indian children (19 per cent) are born with low birthweight, ~4.4 million of whom are born small for gestational age (NFHS-4, 2015-2016). Most Indian women enter pregnancy with poor nutrition – 23 per cent of women in reproductive age are too thin for their height with a body mass index less than 18.5kg/m² and 53 per cent women are anaemic, increasing to 58 per cent among pregnant women. Moreover, 8 per cent of pregnant women (~4.5 million) are adolescents (NFHS-4, 2015–2016). Diets of 71 per cent of pregnant women in rural India are deficient in protein, while diets of 90 per cent are deficient in iron (NNMB, 2012). The average weight gain in pregnancy is only 7 kg (Coffey, 2015).

Schemes in India to improve maternal nutrition are largely delivered through flagship programmes of two ministries – Women and Child Development, and Health and Family Welfare. The Integrated Child Development

Services (ICDS) under the Ministry of Women and Child Development provisions for supplementary food as micronutrient-fortified food and/or energy dense take-home ration for pregnant women and breastfeeding mothers at a unit cost of 9.5 Indian rupees (INR) per women per day for 25 days a month. The supplementary food is intended to provide 600 kilocalories (kcal), 18–20 grams (g) protein and 50 per cent of the recommended dietary allowance of nine essential micronutrients (MWCD, 2010, 2017).

The Ministry of Health and Family Welfare delivers micronutrient supplements (iron and folic acid and calcium), deworming, weight gain monitoring, medicated mosquito nets (in malaria-prone areas) and counselling to pregnant women as part of antenatal care services on monthly outreach and facility based antenatal contact points (MOHFW, 2010, 2013, 2014a, 2014b).

World Health Organization (WHO) 2016 antenatal care guidelines have placed substantially greater emphasis on maternal nutrition assessment and interventions during antenatal care. These guidelines specify balanced energy protein supplementation, micronutrient supplementation (iron folic acid, calcium, deworming), weight gain monitoring and counselling on nutrition and family planning, breastfeeding coupled with efforts to prevent and treat maternal infections and anaemia as core antenatal nutrition-related interventions to reduce risk of stillbirths and small-for-gestational-age newborns.

Importantly, India has the schemes and delivery platforms to implement all of the WHO (2016) guidelines to each pregnant woman. However, the issue has been to ensure the quality and coverage of these schemes to an estimated 30 million pregnancies annually (MoHFW, 2017) and integrating them on one platform to ensure a compound effect of these interventions. For example, receipt of balanced energy and protein supplementation from ICDS and

consumption of iron and folic acid tablets in pregnancy have remained traditionally low at 41 per cent (RSOC, 2014) and 30 per cent (NFHS-4, 2015–2016), respectively.

‘One full meal’ scheme

In order to address these challenges, the state government of erstwhile Andhra Pradesh launched Indiramma Amrutha Hastham in 2013, a maternal on-the-spot feeding and counselling programme, in 102 high-risk blocks to improve maternal nutrient intake and reduce the prevalence and severity of maternal anaemia.

Under this self-selective scheme, open to all pregnant and lactating women in its geographical paradigm, the dry ration was replaced with a hot cooked meal, ‘one full meal’, to be consumed daily at a fixed time, normally between 11 am and 2 pm, at the anganwadi centre (AWC) for 25 days a month throughout pregnancy and in the six months after delivery. The meal’s unit cost per day per beneficiary when the scheme was launched was INR15, out of which the state share was INR11.50 (76 per cent).

The anganwadi worker (AWW) kept a record of the women who enrolled in the programme, services they received, weight they gained during pregnancy and the weight of their children at birth. Districts were given the autonomy to partner with women self-help group (SHG) federations, which could purchase eggs, vegetables and condiments locally. The Civil Supplies Corporation provided cereals, pulses and cooking oil (see Figure 1).

In each anganwadi centre, a five-member committee was constituted to supervise the implementation of the programme, with local community and beneficiaries as representatives. The committee designed the menus, mobilized women to come for the meal each day, supervised meal consumption, administered the iron and folic acid (IFA) supplements, ensured that the women’s weight was monitored, maintained

participation records, reviewed programme progress and submitted monthly accounts to the ICDS project officer.

The scheme was reviewed monthly at the state level, with exclusive telephone lines to address grievances. Dashboards were created for aiding online reporting and monitoring of each beneficiary on critical service uptake indicators, such as attendance, on-the-spot consumption of meal and iron folic acid supplement, receipt of counselling, gestational weight gain and haemoglobin measurement, done by the health worker as part of an outreach antenatal session.

The One Full Meal (OFM) scheme was geographically scaled up in 2015 based on the August 2013 programme data that showed that 96 per cent of eligible women were receiving a meal and iron and folic acid tablets at least 21 days per month and a 2014 independent assessment of 60 anganwadi centres in three districts, which showed remarkable achievements in the health and nutrition practices of women.

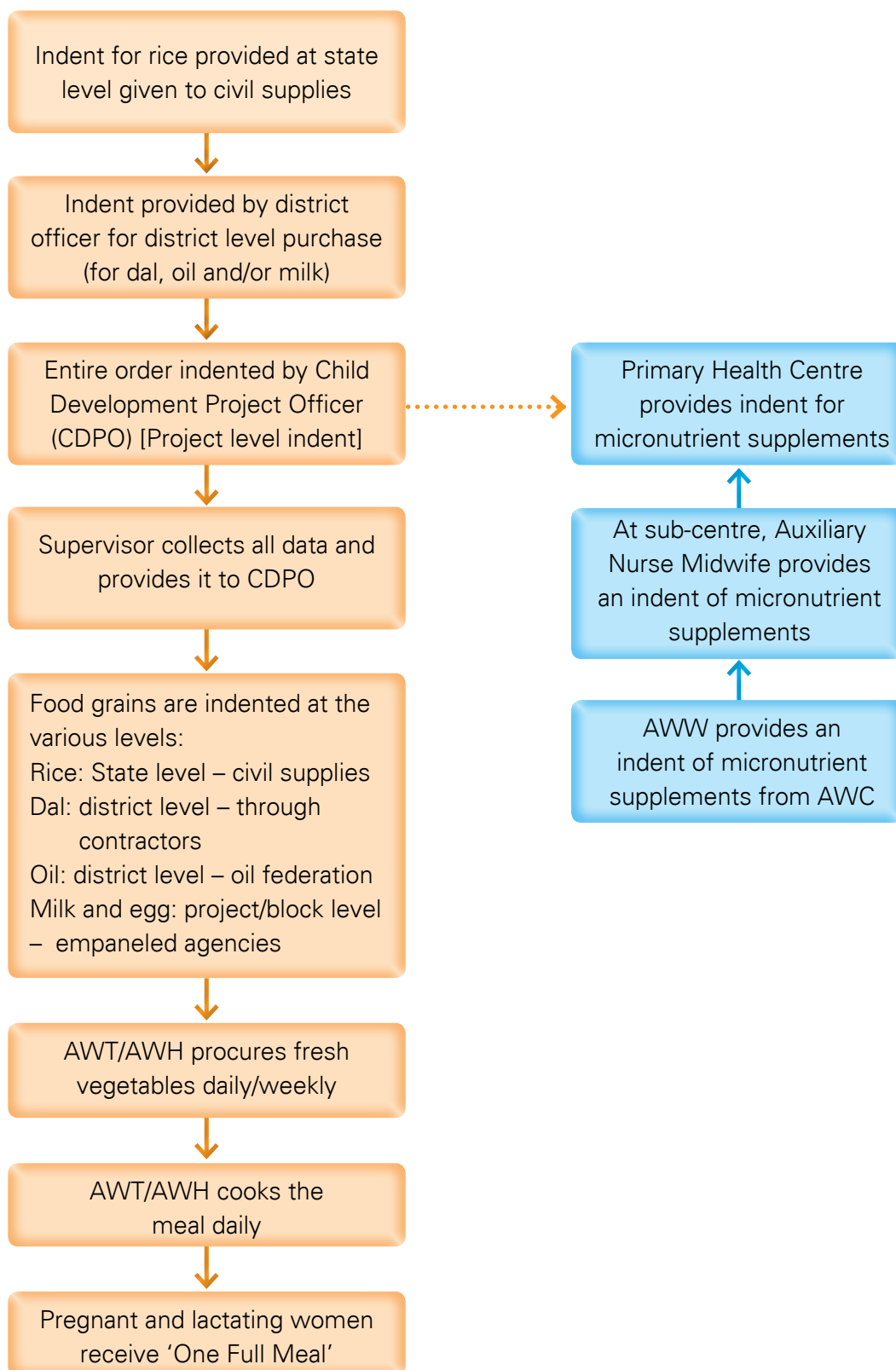
Individual beneficiary tracking was linked to their AADHAAR (Unique Identification Details) and phone number, which also enabled short message service messaging, receiving feedback and preventing duplication of reporting. More recently, indicators such as receipt of maternal calcium, maternal deworming and recording of mid-upper arm circumference (MUAC) have been included and the meal unit cost was increased to INR21, which meant an additional unit cost of INR17.50 borne by the state government.

Based on the positive experiential evidence, the One Full Meal scheme was universalized in Telangana (Arogya Lakshmi scheme) in 2015 and in Andhra Pradesh (Anna Amrutha Hastham scheme) in 2017. The scheme covers over 660,000 beneficiaries across Andhra Pradesh and almost 360,000 beneficiaries across Telangana. It is being implemented with the collaboration of

three Departments – Women and Child Development; Health and Family Welfare; and Tribal Welfare – with a total annual budgetary allocation of INR6 billion (Andhra Pradesh) and INR2.56 billion (Telangana), according to programme records.

In 2017, the scheme was replicated in specific geographies in four other states – Chhattisgarh, Gujarat, Karnataka and Maharashtra.

Figure 1 Flow chart of the One Full Meal scheme



AWC: anganwadi centre; AWH: anganwadi worker helper; AWW: anganwadi worker; AWT: anganwadi teacher

Review of the scheme

Given the interest generated by this scheme and its adaptation across several states in the country, as it provides a platform to bundle various nutrition interventions under one roof, UNICEF India was commissioned by the State Governments of Andhra Pradesh and Telangana to carry out a study with the following objectives:

1. To evaluate on-ground implementation of components of this scheme (meal, health services and counselling) and recorded Management Information System (MIS) data.
2. To seek stakeholder perspectives on what's working and what's not.
3. To explore the potential of this scheme in improving the nutritional profile of the enrolled women.

METHODOLOGY

The study was conducted by UNICEF India in collaboration with three agencies, Amaltas Consulting Private Limited, Centre Economic and Social Studies and National Institute of Nutrition, Hyderabad, and with oversight of a technical advisory group, including the state government departments.

The study design was cross sectional, used mixed methods comprising community-based survey (July and November 2016) and secondary review of programme MIS records for three years (2014, 2015 and 2016) and April–August 2017.

Primary data were collected to assess uptake of various components of the scheme by eligible beneficiaries. Analyses of MIS helped assess effect of the scheme on pregnancy weight gain, birthweight and haemoglobin levels. Using a participatory open space technology workshop method, views of diverse state stakeholders implementing the schemes were sought on barriers and enabling factors influencing the implementation of

the scheme (in December 2015), which was complemented with open-ended interviews of state, district and frontline stakeholders (in July–November 2016).

Primary data collection

Data was collected in the months of July 2016 (in Telangana) and September 2016 (in Andhra Pradesh) by a trained team of six postgraduate nutritionists cum researchers, who were supervised by a team of three senior researchers.

In each state, the districts, blocks and sectors considered the oldest geographies where the scheme was first introduced in 2015 were selected for the survey. In Andhra Pradesh, the study was conducted in four districts (Kadapa, Krishna, West Godavari and Vishakhapatnam) across five ICDS projects (three rural and two tribal), encapsulating 29 ICDS supervisory areas and 60 anganwadi centres (see Appendix 1).

In Telangana, the districts of Karimnagar, Khammam and Warangal were selected, covering five ICDS projects (three rural and two tribal), 30 ICDS supervisory areas and 60 anganwadi centres (see Appendix 2).

A computer-generated random system was used to select blocks, sectors and 12 AWCs per project per state. In each state, 360 pregnant and lactating women who were enrolled in the scheme from the selected 60 anganwadi centres were covered. These women were interviewed for their socio-demographic information, receipt of scheme's services and experience of food insecurity conditions in last 12 months and coping mechanisms during that time. Anthropometry and maternal dietary diversity were ascertained on half the sample (N=180), while 24-hour dietary recall was done on 15 per cent of the sample (N=59).

The interview was done using a pre-tested semi-structured bilingual (English and Telugu)

questionnaire. Questions included age of the woman, status (pregnant/lactating), age at marriage, age at first pregnancy, religion, caste, women who never attended school, practised open defecation, unprotected drinking water source and self-help group membership.

Services received by the women from the Anna Amrutha Hastham scheme/Arogya Lakshmi scheme were also recorded, such as mother and child protection card, antenatal check-ups, deworming, iron and folic acid tablets and calcium tablets, medicated mosquito net and counselling on family planning and nutrition.

Household food insecurity experiences were captured using the standard 8-item Food and Agriculture Organization scale (Ballard, Kepple & Cafiero, 2013). The questions in the Food Insecurity Experience Scale (FIES) included: During the last 12 months, was there a time when, because of lack of money or other resources (job/access to subsidized grains/land/entitlements), you or any other adult member of the household:

1. Were worried that you might not be able to get enough food to eat?
2. Were unable to eat food that you considered nutritious?
3. Replaced nutritious/staple foods with cheaper varieties.
4. Cut the meal size or ate less per meal than normal days.
5. Skip a meal.
6. Was there a time when there was no food in the household?
7. Slept hungry because of lack of food.
8. Went without eating whole day and night because of lack of food.

Household food security responses were categorized as follows: (i) Never: not even once in past year; (ii) Rarely: only once or twice in past year; (iii) Sometimes: in some months but not every month; and (iv) Often: almost every month. 'Sometimes' and

'often' were treated as affirmative responses and the household food insecurity score was calculated based on that. Summed affirmative responses were calculated for each household based on the household food insecurity score (0–7). Households with 0–3 affirmative responses were classified as 'food secure households', those with 4–6 affirmative responses were classified as 'moderately food insecure' and those with 7 affirmative responses were classified as 'severely food insecure households'.

Anthropometric measures included height and mid-upper arm circumference. Height was measured using the UNICEF SECA microtoise (model 216, range 20–205 cm, records variation up to 0.1 cm). MUAC was measured using a MUAC tape with measurement range of 0–59 cm to the nearest 0.1 cm. Women were considered stunted when their height was below 145 cm. MUAC <23 cm and MUAC <21 cm was used as cut-offs for wasting and severe wasting, respectively (Sphere Project, 2011; Verves et al, 2013).

Minimum diet diversity of diet consumed by the respondents was ascertained using the Minimum Dietary Diversity–Women (MDD–W) list-based method (FAO, 2016). This is a simple proxy indicator for global use, which has been shown to reflect one key dimension of diet quality: micronutrient adequacy in the diet of women of reproductive age. The diet diversity score consists of a simple count of 10 food groups: (i) grains, roots, and tubers; (ii) pulses; (iii) nuts and seeds; (iv) dairy; (v) meat, poultry, and fish; (vi) eggs; (vii) dark leafy green vegetables; (viii) other vitamin A-rich fruits and vegetables; (ix) other vegetables; and (x) other fruits.

The individual dietary score reflected nutrient adequacy. Increase in the dietary score was considered to be directly proportional to the nutrient adequacy of the diet. The

score ranged from 0–9, wherein a score less than 3 indicated low diet diversity, 4–5 as medium diet diversity and more than 6 as high diet diversity. According to the MDD-W, women who consumed at least 5 out of the 10 possible food groups over a 24-hour recall period are classified as having minimally adequate diet diversity.

Additionally, dietary intake was assessed using the 24-hour dietary recall method on the subset of 59 beneficiaries. The amount of raw food used for cooking the family meal, the total volume of food cooked and volume of cooked food consumed by the subject (beneficiary) was recorded using standard tools (utensils). The volume of cooked food consumed by the subject was recorded and the raw weight of the food ingredients was calculated by using standard tools (utensils).

The data so obtained were utilized for calculating the approximate amount of raw food consumed by the subject. Data collection for dietary recall was assisted by showing models, pictures or standardized utensils (bowls, glass, spoon, clay models) to the subject. Subsequently, the nutrient intake of each subject was calculated. The nutritive value of food was obtained from the food composition data published in the *Indian Food Composition Table*, Indian Council of Medical Research (Longvah et al., 2017), New Delhi. Recommended dietary allowances suggested by the Indian Council of Medical Research (ICMR, 2010) was utilized to assess the calorie intake of the subject manually.

Data triangulation from programme MIS

The programme MIS captures information on the following maternal variables of each beneficiary of the scheme: (i) identification details; (ii) beneficiary profile (name, age, date of registration, migrant, caste and religion); (iii) last menstrual period; (iv)

gravida; (v) weight, month of pregnancy and haemoglobin at the time of registration in AWC; (vi) weight gain by month of pregnancy; (vii) haemoglobin level by month of pregnancy; (viii) iron folic acid consumption by month of pregnancy; (ix) number of antenatal check-ups; (x) days of attendance (number of days attended for OFM by month); (xi) weight of child at birth and first two years (1st, 2nd, 3rd, 4th, 5th, 6th and 18th and 24th month); (xii) overall attendance of the OFM scheme and for Nutrition and Health Days.

Data from the three years (2014, 2015 and 2016) were collected from the programme MIS. Data for 520 beneficiaries were reviewed for each financial year from the same 60 anganwadi centres where the primary data were collected. The sample size calculated to be representative for each year was estimated to be 384; taking a design effect of 1.35 for clustering effect, a total sample size of n=518 (rounded to n=520) per state per year was arrived at. Additionally, MIS data for April–August 2017 were also collected.

Open space workshop and informal interviews

Views of different stakeholders (n=252) were sought using a participatory approach workshop methodology, Open Space Technology (Owen, 2008), in which the central question addressed the factors constraining and enabling the functioning of the scheme and how best the barriers could be overcome. In addition, one to one open-ended interviews were conducted with stakeholders (consultant (n=2), state (n=3), district (n=5) and field level (n=242)) to find out what worked, what did not and recommendations for the future.

Data entry and analysis

Primary and secondary (MIS) data were entered in CS-Pro version 4.1. Double data entry was done at the end of day by

teams, verified by supervisors. Logs of indicators with errors were generated. Descriptive statistics were generated using SPSS version 12. Qualitative data were triangulated thematically.

Ethical clearance

Ethical approval was obtained from the Amaltas Ethics Board and permission to conduct the research was obtained from the state governments. Verbal consent was obtained from each respondent before administering the questionnaire. Utmost confidentiality of information obtained was ensured by anonymizing the questionnaires and data to prevent linking to any individual.

RESULTS

Andhra Pradesh

In Andhra Pradesh, a total of 360 respondents were interviewed; 57 per cent were pregnant women and 43 per cent lactating while 44 per cent belonged to scheduled castes or scheduled tribes. The average age of the respondents was 22.7 (± 3.3) years, 43 per cent respondents reported being pregnant during adolescence and 21 per cent had never attended school. One third of respondents practised open defecation while 22 per cent had an unprotected drinking water source. Slightly more than a quarter of respondents were members of a self-help group. Overall, maternal stunting, wasting and severe wasting was seen in 8 per cent, 15 per cent and 4 per cent of the women, respectively. The mean MUAC was 25.5 cm (± 3.4) (see Table 1).

All the respondents were those who had enrolled and availed themselves of the scheme's services. While 39 per cent mentioned that they had decided themselves to avail of the services of the scheme, the remaining 61 per cent said it was self-help group members or their family that motivated them to seek the services.

Nearly all respondents perceived the meal to be adequate in quantity and taste. The percentage of respondents who reported consuming DOT micronutrient supplements, such as iron folic acid, calcium, and deworming at the meal site were 23 per cent, 82 per cent and 57 per cent, respectively. Over 90 per cent of respondents mentioned attending a nutrition counselling session in past month and 36 per cent reported attending a session on family planning (see Table 2).

Maternal diet

As high as 93 per cent of pregnant women and 78 per cent of lactating women consumed ≥ 5 food groups. About one third of the pregnant and lactating women consumed dark green leafy vegetables, while about one quarter of pregnant women consumed vitamin A-rich fruit/vegetables. Other fruit was consumed by 66 per cent pregnant women and 29 per cent lactating women. Eggs were consumed by 86 per cent pregnant women and 69 per cent lactating women (see Table 3). Respondents consumed grains, milk, pulses and eggs as they were part of the scheme's meal (see Appendix 3) and 93 per cent of respondents mentioned using iodized salt at home.

The dietary survey was carried out on a subset of 34 pregnant women and 25 lactating women who were beneficiaries of the scheme and had said that they consumed the scheme's meal the previous day.

For the pregnant women, the mean (SD) energy intake was 2,669 kcal (± 866.6) and mean (SD) protein intake was 79 g (± 26.6) based on the meal eaten at site and at home. Thus, 48 per cent and 30 per cent of the pregnant women met their recommended dietary allowance for energy and protein, respectively. Fifteen of the 34 pregnant women were interviewed on a Sunday, when there was no meal provided at the AWC. On

Sunday, the mean (SD) energy intake was 2,244 kcal (± 964.7) and mean (SD) protein intake was 72 g (± 43.1). Only 5 out of the 15 pregnant women met their recommended dietary allowance for energy and protein.

For the lactating women, the mean (SD) energy intake was 2,690 kcal (± 631.0) and mean (SD) protein intake was 78 g (± 17.6). Thus, 12 per cent and 25 per cent of the lactating women met their recommended dietary allowance for energy and protein, respectively. Out of the 25 lactating women, 15 were interviewed on a Sunday, when there was no meal provided at the AWC. On Sunday, the mean (SD) energy intake was 1,946 kcal (± 493.7) and mean (SD) protein intake was 53 g (± 25.1) (see Table 4).

Household food insecurity situation and coping mechanisms

Among other benefits, the availability of a daily meal can pre-empt severe food insecurity conditions. The 360 beneficiaries of the scheme were asked about food insecurity experiences faced by them and their family in the past 12 months. Almost 1 in 10 responded affirmatively to having faced severe food insecurity conditions (in six or more months in the past 12 months), in which they did not eat anything for a whole day and night (see Table 5). Coping mechanisms adopted by the families included household head working overtime (50 per cent), females starting to work outside home (39 per cent) and migration of a family member (19 per cent).

Comparison of tribal and rural sites

Socio-demographically, while other factors were comparable, open defecation and women not attending schools were three times higher in tribal sites than in rural sites (see Table 6). Overall, maternal nutrition and diet diversity were poorer in tribal projects. For example, 19 per cent of women in tribal

project sites were wasted compared with 12 per cent in rural project sites.

Pregnant women consuming minimum diet diversity was lower in tribal sites (79 per cent) than in rural (96 per cent). Similarly, consumption of eggs, green leafy vegetables and vitamin A-rich fruits/vegetables and nuts or seeds differed in tribal sites to rural sites (for example, in pregnancy, eggs: 91 per cent tribal vs. 83 per cent rural; green leafy vegetables: 9 per cent tribal vs. 45 per cent rural; nuts/seeds: 26 per cent tribal vs. 46 per cent rural).

The nutrition composition of the meal consumed at the site or at home was better in tribal sites than in rural sites. Self-help group members played a larger role in influencing women in tribal sites compared with rural sites to avail themselves of the scheme's meal and related services (62 per cent vs. 26 per cent, not in Table). However, DOT consumption of iron folic acid on site was lower in tribal than rural sites (16 per cent vs. 27 per cent) and a similar trend was seen in receipt of nutrition counselling (81 per cent tribal vs. 96 per cent rural) and family planning counselling (29 per cent tribal vs. 41 per cent rural). Tribal areas are also co-locations for malaria, where 53 per cent of respondents in tribal study sites received medicated mosquito nets.

Programme monitoring data

The programme monitoring data from the three years showed that the average number of days (SD) beneficiaries received a meal in a month, out of the mandated 25 days, was 17 (± 6.7) in 2014–2015, 17.8 (± 7.9) in 2015–2016 and 20 (± 6.5) in 2016–2017. It was 19 (± 6.7) in April–August 2017. Average weight gain (kg) between the second and ninth month of pregnancy was 8.3 (± 2.7), 9.7 (± 2.2), 8.9 (± 2.9) and 9.1 (± 1.9) in the same periods, respectively.

Less than 5 per cent of the children whose birthweights were recorded were born with low birthweight. But haemoglobin levels of mothers recorded at the time of entry and at the time of last reading were low. The number of Nutrition and Health Day sessions that were organized were 85 and 78 in 2014–2015 and 2015–2016, respectively (see Table 7).

Telangana

In Telangana, a total of 360 respondents were interviewed, 51 per cent were pregnant and 49 per cent were lactating, and 46 per cent belonged to scheduled castes or scheduled tribes. The average age of the respondents was 22.8 years (± 3.0), with 29 per cent respondents reported to be pregnant during their adolescent period and 9 per cent reported never attending school.

Over 40 per cent respondents practised open defecation. One in three respondents was a member of a self-help group. Overall, maternal stunting, wasting and severe wasting was seen in 8 per cent, 22 per cent and 12 per cent of women, respectively. The mean MUAC was 24.5 cm (± 3.4) (see Table 8).

All the respondents were those who had enrolled and availed themselves of the scheme's services. While 24 per cent mentioned that they had decided themselves to avail of the services, the remaining 76 per cent said it was self-help group members (65 per cent) or their family (11 per cent) that motivated them to seek the scheme's services.

Nearly all respondents perceived the meal to be adequate in quantity and taste. The percentage of respondents who reported consuming DOT micronutrient supplements, such as iron folic acid and calcium, and deworming at the meal site were 14 per cent, 92 per cent and 55 per cent, respectively. About 98 per cent respondents mentioned

attending at least one counselling session the past month and 42 per cent reported attending a session on family planning (see Table 9).

Maternal diet

As high as 95 per cent of pregnant women and 91 per cent of lactating women consumed ≥ 5 food groups. About two thirds of the pregnant and lactating women consumed dark green leafy vegetables and more than one third consumed vitamin A-rich fruit/vegetables. Other fruit was consumed by 44 per cent pregnant women and 32 per cent lactating women. Eggs were consumed by 88 per cent pregnant women and 78 per cent lactating women (see Table 10). Respondents consumed grains, milk, pulses and eggs as they were part of the scheme's meal (see Appendix 4), and 89 per cent mentioned using iodized salt at home.

The dietary survey was carried out on a subset of 28 pregnant women and 32 lactating women who were beneficiaries of the scheme and said that they consumed the scheme's meal the previous day.

For pregnant women, the mean (SD) energy intake was 2,650 kcal (± 810.9) and mean (SD) protein intake was 78 g (± 26.7). Thus, 53 per cent and 38 per cent of the pregnant women met their recommended dietary allowance for energy and protein, respectively. Out of the 28 pregnant women, 17 were interviewed on a Sunday, when there was no meal provided at the AWC. On Sunday, the mean (SD) energy intake was 2,464 kcal (± 778.5) and mean (SD) protein intake was 82 g (± 38.1). This meant that only 7 out of the 17 pregnant women met their recommended dietary allowance for energy and protein.

For lactating women, the mean (SD) energy intake was 2,816 kcal (± 658.8) and mean (SD) protein intake was 84 g (± 21.3). Thus, 19 per cent and 72 per cent lactating women

met their recommended dietary allowance for energy and protein, respectively. Out of the 32 lactating women, 13 were interviewed on a Sunday, when there was no meal provided at the AWC. On Sunday, the mean (SD) energy intake was 2,546 kcal (± 797.7) and mean (SD) protein intake was 72 g (± 28.2). This meant that only 2 out of the 13 lactating women met their recommended dietary allowance for energy and protein (see Table 11).

Household food insecurity situation and coping mechanisms

Among other benefits, the availability of a daily meal can pre-empt severe food insecurity conditions. The 360 beneficiaries of the scheme were asked about food insecurity experiences faced by them and their family in the past 12 months. Over 5 per cent responded affirmatively to having faced severe food insecurity conditions (in 6 or more months in the past 12 months), in which they did not eat anything for a whole day and night (see Table 12). Coping mechanisms adopted by the families included household head working overtime (46 per cent), females starting to work outside home (45 per cent), children of household working outside home (6 per cent) and migration of a family member (11 per cent).

Comparison of tribal and rural sites

Socio-demographically, while other factors were comparable, 37 per cent of women in tribal sites practised open defecation and 10 per cent did not attend school compared with 43 per cent and 8 per cent of women in rural sites, respectively (see Table 13).

Overall, maternal nutrition and diet diversity were poorer in tribal projects. For example, 24 per cent of women in the tribal project sites were wasted compared with 21 per cent in rural project sites. The consumption of eggs, green leafy vegetables and vitamin A-rich fruits/vegetables and nuts or seeds differed in tribal sites to rural sites (for

example, in pregnancy, eggs: 97 per cent tribal vs. 82 per cent rural; green leafy vegetables: 59 per cent tribal vs. 62 per cent rural; nuts/seeds: 30 per cent tribal vs. 37 per cent rural).

Nutrition composition of the meal consumed at the site or at home was better in tribal sites compared with rural sites. Self-help group members played a larger role in influencing women in tribal sites than in rural sites to avail themselves of the meal and related services (75 per cent vs. 51 per cent, not in Table). However, DOT consumption of iron folic acid on site was lower in tribal than in rural sites (8 per cent vs. 17 per cent) and a similar trend was seen in receipt of nutrition counselling (97 per cent tribal vs. 98 per cent rural) and family planning counselling (26 per cent tribal vs. 53 per cent rural). Tribal areas are also co-locations for malaria, where 28 per cent of respondents in tribal study sites received medicated mosquito nets.

Programme monitoring data

The programme monitoring data from the three years showed that the average number of days beneficiaries received the meal in a month, out of the mandated 25 days, was 21 (± 3.6) in 2014–2015, 21 (± 3.8) in 2015–2016 and 22 (± 4.3) in 2016–2017. It was 23 (± 1.2) in April–August 2017.

The average weight gain between the second and ninth month of pregnancy was 9 kg (± 2.4), 9.5 (± 3.4), 8.7 (± 3.8) and 9.6 (± 3.9) for the same periods, respectively.

Less than 5 per cent of the children whose birthweights were recorded were born with low birthweight. But haemoglobin levels of mothers recorded in the last reading still showed that all beneficiaries were anaemic.

The percentage of anganwadi centres that organized the minimum of one Nutrition and Health Day session were 86 per cent, 92 per cent and 98 per cent in the last

three years, respectively. It was 96 per cent in April–August 2017 (see Table 14).

Programme implementers identify priority areas

The general consensus of stakeholders, whose views were garnered through qualitative methods, was that the OFM scheme is a useful programme, with several aspects making it attractive but some areas requiring improvement to enhance performance. Some important areas where the stakeholders felt that improvements are warranted include:

- (i) increased ownership of local bodies for community audit/review of quality of services;
- (ii) ensuring basic cooking, water and sanitation infrastructure at/near meal site (e.g., drinking water, toilet and dustbin) and motivating those who do not come regularly;
- (iii) weighing scales and accuracy should be checked periodically and broken ones replaced;
- (iv) nutrition and health education session to be increased and dedicated to non-nutrition issues, such as family planning and malaria, and newly wed women should be invited to this session;
- (v) women who are not gaining sufficient weight should be tag-tracked and supported; and
- (vi) counselling sessions should be made more interesting by introducing before and after video stories of the beneficiaries, video communication and folk media.

DISCUSSION

Summary of main findings

The socio-demographic characteristics, from both rural and tribal regions, were reflective of underprivileged populations. The average age of respondents was ~23 years, with slightly more pregnant (Andhra Pradesh 57 per cent, Telangana

51 per cent) than lactating women. Nearly 45 per cent belonged to scheduled castes or tribes and 30–43 per cent reported being pregnant during their adolescence. The prevalence of maternal stunting was 8 per cent, wasting 15–22 per cent and severe wasting 4–12 per cent.

Only 25–40 per cent beneficiaries had enrolled on their own initiative while the majority were motivated by self-help groups or family members. Nearly all the beneficiaries perceived the meal to be adequate in quantity and taste. Minimum dietary diversity (≥ 5 food groups) was documented in the vast majority (78–95 per cent), as also consumption of high quality foods, like eggs and milk (69–99 per cent).

In comparison with Sundays, when the scheme's meal was not served, the computed dietary energy and protein intake was mostly higher on days when the meal was consumed. On-the-spot iron folic acid consumption was poor (14–23 per cent). Nutritional counselling had been imparted to nearly all, but only 40 per cent had received family planning counselling. Severe (Andhra Pradesh 2.5 per cent, Telangana 3.9 per cent) and moderate (Andhra Pradesh 10 per cent, Telangana 8.3 per cent) household food insecurity was uncommon, as assessed by raw scores.

In general, socio-demographic characteristics, maternal nutrition, diet diversity, on-the-spot consumption of iron and folic acid, and counselling were poorer in tribal projects.

Data retrieved from the Management Information System of the three years and April–August 2017 indicated that average days of food consumption during a month ranged from 17 to 22.6 days, against the targeted 25 days. The estimated mean weight gain between the second and ninth month of pregnancy ranged from 8.3–9.7 kg. The mean haemoglobin level was low. The

vast majority (≥ 90 per cent) of the AWCs had organized at least one Nutrition and Health Day session during the past one month.

The resounding consensus from the qualitative survey of various stakeholders was that the OFM scheme is a useful programme, which is well accepted by beneficiaries, with several aspects making it attractive, but some areas requiring early improvement to enhance performance. Some important suggestions included increased ownership of local bodies for community audit/review of quality of services; ensuring basic cooking, water and sanitation infrastructure; motivating beneficiaries who attend irregularly; availability of proper weighing scales; and greater and functional linkage with health services, including counselling.

Strengths and limitations

This study is one of very few formal operational evaluations on a large scale on the maternal nutrition programme, One Full Meal, employing mixed quantitative and qualitative techniques with due diligence for sampling methodology and quality assurance. The sample included functioning rural and tribal projects to enhance representativeness.

The primary objective was implementation research, namely to gain insights into ground realities of the functional scheme and stakeholder perspectives to provide relevant input for improving programme performance. The socio-demographic and maternal nutrition profile setting was similar to rural and tribal populations of several states of India; these findings may therefore be relevant for such states, if they are contemplating adopting and adapting the One Full Meal Scheme.

However, the following limitations of the study merit consideration. The study was focused on a functional programme, which precluded the conduct of an experimental

randomized controlled design or evaluation of the entire population covered by the feeding centre. Thus, the observational study design around a functional programme in conjunction with the secondary analysis from the Management Information System does not permit robust causal inferences due to potential biases. A relatively small sample size is a further limitation. Nevertheless, some inferences, particularly from a programme strengthening perspective, seem plausible.

The sampling framework was based on the ICDS classification of rural and tribal projects. However, this may not be concordant with the demographic classifications of rural and tribal populations. The ability to draw conclusions on marginalized groups, like scheduled caste and scheduled tribe populations, may therefore have been compromised.

Logistic considerations resulted in a modification of the 24-hour diet recall protocol according to the context. Diet recall studies are typically conducted at home to make use of similar cooking ingredients and utensils, allowing for better accuracy. However, as the primary focus was documentation of programme functioning in relation to the diet of pregnant and lactating women, accurate capture of food consumption at the anganwadi centre was prioritized and 24-hour dietary recall done with utensils brought by data collection teams.

Key inferences with programme implications

1. Not all vulnerable groups may be covered by the scheme and greater efforts are needed to include them

The study design does not permit an estimate of the proportion of eligible beneficiaries from the region participating in this facility based maternal nutrition programme. Often, the marginalized and vulnerable segments

(extremely poor, illiterate, lower castes or tribes, diseased) remain divorced from such schemes. In this data set, although scheduled castes and tribes comprised ~45 per cent of beneficiaries, a smaller proportion could be classified as vulnerable (stunted, wasted or households with moderate or severe food insecurity).

The scheme is therefore partially addressing social inequity through participation of some deprived beneficiaries. However, the proportion of such vulnerable pregnant women is substantially lower than that documented in recent large population-based surveys from Bihar, Chhattisgarh and Odisha – stunted 9.8–13.4 per cent, wasted 35.8–53.9 per cent, households with moderate food insecurity 21.0–44.4 per cent and households with severe food insecurity 6.3–20.1 per cent (UNICEF, 2016a, 2016b, 2017). It is therefore entirely conceivable that not all marginalized and deprived beneficiaries are reaping the benefits of this programme. There is thus an urgent need for dedicated efforts to search for and enroll such beneficiaries through multiple channels, including health workers, self-help groups and local leaders.

On average, the enrolled beneficiaries availed themselves of the scheme's meal between 70 per cent and 85 per cent of the targeted 25 days. Thus, they need constant education and motivation for continued attendance to reap maximal benefit. Real-time MIS use could prove helpful in tracking and reminding defaulters. Stakeholders' suggestion to allow home delivery of food packets to physically disabled or ill beneficiaries and those residing in remote or inaccessible areas needs careful evaluation to prevent potential misuse and leakages.

The majority (60–75 per cent) of the beneficiaries were motivated to enroll by self-help groups or family members, suggesting the crucial persuasive role of

peers and family members. Constant efforts through these and similar channels, including media and mobile phones, may be required to increase attendance and prevent default. Obviously greater efforts and intensity would be required for the relatively underprivileged, illiterate and those in inaccessible tribal regions.

2. Maternal diet may have been enhanced but ground-level management is needed to improve benefits

In this setting, the One Full Meal scheme is operationalizing an important recommendation from the recent WHO guidelines for a positive pregnancy experience (WHO, 2016): “In undernourished populations, balanced energy and protein dietary supplementation is recommended for pregnant women to reduce the risk of stillbirths and small-for-gestational-age neonates (context-specific recommendation)”.

Nearly all the beneficiaries perceived the meal to be adequate in quantity and taste. Although causal inferences are suspect with this study design, it is likely that the meal enhanced maternal dietary quality and quantity. First, minimum dietary diversity (≥ 5 food groups) was evident for the vast majority (78–95 per cent), as also consumption of high quality foods like eggs and milk (69–99 per cent). This dietary diversity is substantially better than that documented in recent large population-based surveys on pregnant women from Bihar, Chhattisgarh and Odisha, where the minimum dietary diversity was 33.5–57.3 per cent, egg consumption 8.7–10.7 per cent, and milk consumption 12.8–32.5 per cent (UNICEF, 2016a, 2016b, 2017).

Second, in comparison with Sundays when the scheme's meal was not served, the computed dietary energy and protein intake was mostly higher on days when the scheme's meal was consumed, which

helps in bridging the gap in the beneficiaries' recommended dietary allowance. Third, nutritional counselling had been imparted to nearly all beneficiaries, which may have translated into better utilization of household dietary resources.

Fourth, severe (Andhra Pradesh 2.5 per cent, Telangana 3.9 per cent) and moderate (Andhra Pradesh 10 per cent, Telangana 8.3 per cent,) household food insecurity was uncommon, which could either be an effect of additional food availability through the scheme or a reflection of participant bias.

Qualitative data suggested that apart from the sufficient quantity of a tasty meal, providing eggs and milk added substantial value to the acceptability by beneficiaries. At some centres, there was interruption in the regular supply of eggs due to contractor problem. Moreover, beneficiaries preferred polished rice to the unpolished rice they were served. Regular managerial problem solving at micro-level would be important to address these issues to ensure regular supply of high quality foods in conformity with local food preferences.

3. OFM scheme has potential to be platform for integrating nutrition and health interventions to ensure positive maternal health outcomes

This scheme represents a unique opportunity to amalgamate nutrition and other health-related preventive and promotive activities to ensure a positive pregnancy outcome, especially through daily interaction with health functionaries and peers. Among several potential inputs, frequency of nutritional counselling seems reasonable, with almost all beneficiaries receiving counselling within the past month; however, the quality cannot be commented upon with this study design. Conversely, only 40 per cent were counselled on the crucial aspects of family planning, which needs to be addressed on a priority basis.

The poor on-the-spot consumption of iron folic acid tablets (Andhra Pradesh 23 per cent, Telangana 14 per cent) was disappointing and may be partially contributing to low haemoglobin levels, even at near term. Stakeholders blamed infrequent and incomplete drug supplies for this situation. Urgent remedial steps are necessary if maternal anaemia and its consequences are to be addressed. Apart from ensuring regular and adequate supplies, providing storage facilities for IFA tablets at the AWC, monitoring and reporting on IFA administration post-meal and IFA-focused counselling need attention.

In the absence of storage facilities at the AWC, pregnant and lactating women can be encouraged to carry a blister pack of their tablets daily to the AWC. The IFA tablet consumption post-meal can then be monitored and recorded in the register by the AWW/AWT. It was reassuring that on-the-spot consumption of calcium tablets (Andhra Pradesh 82 per cent, Telangana 92 per cent) and periodic deworming (Andhra Pradesh 57 per cent, Telangana 55 per cent,) were much better but still inadequate.

The OFM scheme has the potential to become an efficient and cost-effective platform to deliver amalgamated nutrition and non-nutrition interventions outlined in the recent WHO guidelines for a positive pregnancy outcome (WHO, 2016). It could also serve as a workable mechanism for identifying high-risk pregnancies (for example, malnutrition, inadequate pregnancy weight gain, pregnancy-related disease) and facilitating priority referral to the next level of health care. However, it is evident that the non-food component is functioning poorly at ground level and urgent, relevant and perseverant efforts are necessary to ensure efficient convergence with the health system and functionaries.

4. Potential of Management Information System is not fully utilized and should be explored

Plausible and consonant data were retrieved from the Management Information System for three years and April–August 2017 for almost all the variables (meal consumption days, pregnancy weight gain, haemoglobin, nutrition and health days), which suggests reasonable programmatic quality. However, the low birthweight prevalence from MIS indicating below 5 per cent is implausible and may be biased as the data pertain to the subset with birthweight records. The study design does not permit inferences about the practical use of this data set, which could be used for action to improve programme outcomes.

The opportunity presented through the daily presence of pregnant and lactating women at AWCs can be utilized to create an effective integrated health and nutrition monitoring system. A robust monitoring and reporting framework can quantify programmatic progress and provide input for remedial actions. The monitoring matrix should include indicators to track maternal and child health and nutrition.

It seems likely that the potential of MIS is not being fully exploited for logistical aspects and for individual beneficiary use (for example, identifying high-risk individuals on basis of pregnancy weight gain, low haemoglobin level, tracking and reminding

defaulters, referral). Implementation research is desirable to examine the validity of the MIS data and its potential utility for individual beneficiaries in real time.

5. Insights from stakeholders can improve programme efficiency

The study's qualitative methods yielded valuable insights from stakeholders into factors that are working, those that are not working and recommendations for future. The resounding consensus was that this is a useful programme, which is well accepted by beneficiaries, and several aspects are making it attractive, but some areas require early improvement to enhance performance.

Some important suggestions included increased ownership of local bodies for community audit/review of quality of services; ensuring basic cooking, water and sanitation infrastructure; motivating beneficiaries who attend irregularly; availability of proper weighing scales; and greater and functional linkage with health services, including counselling.

Moreover, tribal projects need sustained efforts because these populations have poorer socio-demographic and health indices, are more marginalized, illiterate and difficult to reach. It would be vital to hold similar probes at periodic intervals and act on stakeholder suggestions to enhance efficiency.

CONCLUSION

The One Full Meal Scheme is a useful programme, which is well accepted by beneficiaries, with several aspects making it attractive, but some areas requiring early improvement to enhance performance. Social inequity is being partially addressed through participation of some deprived and vulnerable beneficiaries, including those from scheduled castes and tribes. However, more efforts are required to reach the unreached and minimize default rates of recruited beneficiaries through counselling, peers, families and self-help groups.

It is likely that the meal enhanced maternal dietary quality and quantity; minimum dietary

diversity was evident for the vast majority, as also consumption of high quality foods, like eggs and milk. The non-food components, particularly on-the-spot iron folic acid consumption and family planning counselling, are functioning poorly at ground level and urgent, relevant and perseverant efforts are necessary to ensure efficient convergence with the health system and functionaries.

Plausible and consonant data were retrieved from the Management Information System; however, its full potential for managerial aspects and individual beneficiary use needs exploration. Stakeholders provided valuable insights and their suggestions merit action for improving programme performance.

LITERATURE CITED

Ballard, T.J., A.W. Kepple and C. Cafiero, 'The food insecurity experience scale: development of a global standard for monitoring hunger worldwide', Food and Agriculture Organization, Rome, 2013, www.fao.org/fileadmin/templates/ess/voh/FIES_Technical_Paper_v1.1.pdf, accessed 25 September 2017.

Coffey, D., 'Pre-pregnancy body mass and weight gain during pregnancy in India and sub-Saharan Africa', *Proceedings of the National Academy Science*, vol. 112, no.11, 2015, pp. 3302–3307.

Danaei, G., et al., 'Risk Factors for Childhood Stunting in 137 Developing Countries: A Comparative Risk Assessment Analysis at Global, Regional, and Country Levels', *PLOS Medicine*, vol. 13, no. 11, 2016, pp. e1002164.

Food and Agriculture Organization (FAO) and FHI, *Minimum dietary diversity for women: a guide for measurement?*, FAO, Rome, 2016.

Ministry of Health and Family Welfare, 'Health Management Information System (HMIS)', 2017, <https://nrhm-mis.nic.in/SitePages/Home.aspx>.

International Institute for Population Sciences (IIPS) and Macro International, *National Family Health Survey (NFHS-4) 2015–16*, International Institute of Population Sciences, Mumbai, India, www.rchiips.org/nfhs/nfhs4.shtml.

Indian Council of Medical Research (ICMR), 'Nutrient requirements and recommended dietary allowances for Indians', A report of the expert group of the Indian Council of Medical Research, NIN, Indian Council of Medical Research, 2010.

Longvah T., et al., *Indian Food Composition Table*, National Institute of Nutrition, Hyderabad, Indian Council of Medical Research, 2017.

Ministry of Health and Family Welfare, 'Guidelines for Antenatal Care and Skilled Attendance at Birth by ANMs/LHVs/SNs', Government of India, New Delhi, India, 2010, https://www.nhp.gov.in/sites/default/files/anm_guidelines.pdf.

Ministry of Health and Family Welfare, 'Guidelines for control of anaemia: national iron plus initiative', Government of India, New Delhi, India, 2013, www.unicef.org/india/10._National_Iron_Plus_Initiative_Guidelines_for_Control_of_IDA.pdf.

Ministry of Health and Family Welfare, Maternal Health Division, 'National guidelines for Calcium supplementation during pregnancy and Lactation', 2014a, Government of India, New Delhi, India, www.nrhmhp.gov.in/sites/default/files/files/NG_calcium.pdf.

Ministry of Health and Family Welfare, 'National guidelines for deworming in Pregnancy', 2014b, Government of India, New Delhi, India, http://rmncha.in/wp-content/uploads/guidelines_img/1475124659.pdf.

Ministry of Women and Child Development, *Annual Report 2009-2010*, Government of India, New Delhi, India, 2010, www.wcd.nic.in/sites/default/files/AR2009-10.pdf.

Ministry of Women and Child Development, *Annual Report 2016-2017*, Government of India, New Delhi, India, 2017, www.wcd.nic.in/sites/default/files/FINAL%20WCD_AR_English%202016-17.pdf.

National Nutrition Monitoring Bureau (NNMB), 'Diet and Nutritional Status of Rural Population, Prevalence of Hypertension & Diabetes among Adults and Infant & Young Child Feeding Practices - Report of Third Repeat Survey', NNMB Technical Report No. 26, 2012.

Neufeld, L.M., et al., 'Changes in maternal weight from the first to second trimester of pregnancy are associated with fetal growth and infant length at birth', *American Journal of Clinical Nutrition*, vol. 79, no. 4, 2004, pp.646–652.

Owen, H., *Open Space Technology*, 3rd Edition, Berrett-Koehler, San Francisco, 2008.

Rapid Survey on Children (RSOC) (2013–2014), Ministry of Women and Child Development, 'National Report', Government of India, India, 2014, <http://wcd.nic.in/sites/default/files/RSOC%20National%20Report%202013-14%20Final.pdf>.

Sphere Project, *Sphere Handbook: Humanitarian Charter and Minimum Standards in Disaster Response, 2011*, 2011, www.refworld.org/docid/4ed8ae592.html, accessed 30 October 2017.

United Nations Children's Fund (UNICEF), 'Swabhimaan programme, Baseline Survey in Bihar, India', 2016a, (unpublished).

United Nations Children's Fund (UNICEF), 'Swabhimaan programme, Baseline Survey in Odisha, India', UNICEF 2016b, (unpublished).

United Nations Children's Fund (UNICEF), 'Swabhimaan programme, Baseline Survey in Chhattisgarh, India', UNICEF 2017, (unpublished).

Ververs, M. et al., 'Which anthropometric indicators identify a pregnant woman as acutely malnourished and predict adverse birth outcomes in the Humanitarian context?', *PLOS Currents: Disasters*, 2013.

World Health Organization (WHO), 'Maternal anthropometry and pregnancy outcomes: A WHO collaborative study', *Bulletin of the World Health Organization*, WHO, Geneva, Switzerland, vol. 73 (suppl.), 1995.

World Health Organization (WHO), *WHO recommendations on antenatal care for a positive pregnancy experience*, WHO, Geneva, Switzerland, 2016, <http://apps.who.int/iris/bitstream/10665/250796/1/9789241549912-eng.pdf>.





TABLES

ANDHRA PRADESH

Table 1 Sample characteristics, Andhra Pradesh (N=360)

Sample characteristic	
Age in years (mean \pm SD)	22.7 (\pm 3.3)
Pregnant (%)	57.2
Lactating (%)	42.8
Age (years) at first pregnancy (mean \pm SD)	19.1 (\pm 2.5)
Age (years) at first pregnancy less than 20 years (%)	42.9
Religion (%)	
Hindu	70.8
Muslim	7.5
Others*	21.7
Caste (%)	
Scheduled caste	26.7
Scheduled tribe	17.5
Other backward class	30.3
Others	25.5
Has never attended school (%)	21.4
Practice open defecation (%)	31.7
Unprotected drinking water source (%)**	22.2
Member of a self-help group (%)	28.9
Anthropometry	N = 180
Height less than 145 cm (%)	8.3
Mid-upper arm circumference less than 23 cm (%)	15.0
Mid-upper arm circumference less than 21 cm (%)	3.9
Mid-upper arm circumference (cm) (mean \pm SD)	25.5 (\pm 3.4)

* Jainism, Sikhism and Buddhism.

** Tube well or borehole, unprotected dug well, rainwater collection, tanker/truck, cart with small tank, surface water (river, dam, lake, pond, stream, canal, irrigation canal).

Table 2 Receipt of services from Anna Amrutha Hastham scheme, Andhra Pradesh (N=360)

As reported by the beneficiaries	%
Decision to take Anna Amrutha Hastham scheme meal	
Self	39.4
Self-help group member	40.6
Family member	20.0
Perception – meal is sufficient in quantity	94.4
Perception – meal is adequate in taste	97.2
Place of iron folic acid tablet consumption	
At anganwadi centre	22.6
At home	77.4
Did not take	0.0
Have mother child protection card	82.5
Received deworming tablets	56.9
Received calcium tablets	82.2
Received medicated mosquito net	22.8
Received advice on family planning	36.4
Consumed alcohol and/or tobacco while pregnant	2.5
Use iodized salt at home	92.8
Received at least one nutrition counselling session in last month	90.0

Table 3 Maternal dietary diversity, Andhra Pradesh

	Pregnant N=112 %	Lactating N=68 %
Type of food groups consumed		
Grains/white tubers	100.0	100.0
Pulses, beans or peas	95.5	91.2
Nuts or seeds	38.4	19.1
Milk or milk products	92.0	92.7
Meat, poultry, seafood or animal product	17.9	17.7
Eggs	85.7	69.1
Dark green vegetables	31.3	32.4
Yellow fruits/vegetables (vitamin A rich)	27.8	16.1
Other vegetables	76.8	75.0
Other fruits	66.1	29.4
No. of food groups consumed		
1	1.8	2.9
2	5.3	2.9
3	10.7	16.2
4	29.5	26.5
5	28.6	17.6
6	20.5	26.5
7	2.8	5.9
8 or more	0.9	1.5
Minimum dietary diversity*	92.9	77.9

* A diverse diet is one in which five or more food groups are represented as per FAO (2016) criteria.

Table 4 Protein and energy consumption of women based on 24-hour dietary recall method, Andhra Pradesh

	Pregnant	Lactating
Recommended daily dietary allowance (moderate worker)	Energy: 2580 kcal Protein: 78 g	Energy: 2830 kcal Protein: 74 g
Consumption		
Based on meal eaten at site and at home	N=34	N=25
Energy, kcal, Mean (SD)	2668.9 (\pm 866.6)	2690.0 (\pm 631.0)
Protein, g, Mean (SD)	78.7 (\pm 26.6)	78.3 (\pm 17.6)
Based on meal eaten at home	N=34	N=25
Energy, kcal, Mean (SD)	1762.8 (\pm 737.9)	1853.8 (\pm 573.8)
Protein, g, Mean (SD)	49.6 (\pm 23.3)	50.8 (\pm 15.1)
Based on meal eaten at site	N=34	N=25
Energy, kcal, Mean (SD)	906.1 (\pm 195.9)	836.2 (\pm 234.3)
Protein, g, Mean (SD)	29.2 (\pm 5.9)	27.4 (\pm 7.4)
Based on Sunday meal	N=15	N=15
Energy, kcal, Mean (SD)	2244.0 (\pm 964.7)	1945.8 (\pm 493.7)
Protein, g, Mean (SD)	72.2 (\pm 43.1)	53.0 (\pm 25.1)

Table 5 Food security and coping mechanisms, Andhra Pradesh (N=360)

Indicator	%
Affirmative responses, prefixed with 'within last 12 months'	
Worried about getting enough food to eat (sometimes/always)	4.7
Unable to eat nutritious food due to lack of money	18.9
Ate only few foods due to lack of money	33.1
Had to skip a meal due to lack of money	21.1
Ate less than should due to lack of money	16.7
Household ran out of food due to lack of money	7.5
Were hungry but did not eat	16.9
Did not eat for a whole day and night	8.6
Raw score (affirmative response)	
0	47.5
1	21.7
2	12.8
3	5.6
4	5.8
5	3.1
6	1.1
7	1.7
8	0.8
Food security	
Food secure (raw score 0–3)	87.5
Moderately food insecure (raw score 4–6)	10.0
Severely food insecure (raw score 7–8)	2.5
Coping behaviours, prefixed with 'unlike earlier'	
Household head works overtime	50.3
Female(s) of household work outside the home	38.9
Children of household work outside home	2.2
Family member has had to migrate to earn money	19.2
Borrowed money to meet household expenses	63.1
Used low-cost food grains/items	64.6
Borrowed grains to meet food requirements	44.0
Household articles or possessions sold	10.9

'Money' as used in this Table paraphrases 'money and resources'.

Table 6 Comparison of selected indicators of tribal and rural sites, Andhra Pradesh

Indicator	Rural sites	Tribal sites
Demographic characteristics	N = 216	N = 144
Age in years (mean SD)	22.6 (\pm 3.1)	22.8 (\pm 3.5)
Pregnant (%)	59.3	55.6
Lactating (%)	40.7	44.4
Age at first pregnancy (mean SD)	20.2 (\pm 2.7)	20.4 (\pm 2.7)
Has never attended school (%)	10.2	38.2
Practice open defecation (%)	17.6	52.8
Member of a self-help group (%)	25.0	34.7
Anthropometry	N = 108	N = 72
Height less than 145 cm (%)	6.5	11.1
Mid-upper arm circumference less than 23 cm (%)	12.0	19.4
Mid-upper arm circumference less than 21 cm (%)	3.7	4.2
Services uptake	N = 216	N = 144
Perception – meal is sufficient in quantity	94.0	95.1
Perception – meal is adequate in taste	97.2	97.2
Place of iron folic acid tablet consumption		
At anganwadi centre	26.5	16.3
At home	73.5	83.7
Received deworming tablets	43.5	77.1
Received calcium tablets	83.8	79.9
Received medicated mosquito net	2.3	53.5
Received advice on family planning	41.2	29.2
Consumed alcohol and/or tobacco while pregnant	0.5	5.6
Use iodized salt at home	93.1	92.4
Received at least one counselling session in last month	95.8	81.3
Diet diversity (\geq 5 food groups)	95.6	79.2
Food security	N = 216	N = 144
Moderately food insecure (raw score 4–6)	11.6	7.6

Table 6 (contd.)

Indicator	Rural sites	Tribal sites
Protein and energy consumption by pregnant women		
Based on meal eaten at site and at home	N = 17	N = 17
Energy, kcal, Mean (SD)	2280.8 (\pm 791.8)	3034.1 (\pm 788.6)
Protein, g, Mean (SD)	70.6 (\pm 23.5)	86.5 (\pm 27.6)
Based on meal eaten at home	N = 17	N = 17
Energy, kcal, Mean (SD)	1441.6 (\pm 689.4)	2065.1 (\pm 665.8)
Protein, g, Mean (SD)	42.5 (\pm 21.4)	56.3 (\pm 23.5)
Protein and energy consumption by lactating mothers		
Based on meal eaten at site and at home	N = 12	N = 13
Energy, kcal, Mean (SD)	2474.6 (\pm 473.2)	2888.9 (\pm 708.4)
Protein, g, Mean (SD)	73.1 (\pm 17.0)	83.1 (\pm 17.4)
Based on meal eaten at home	N = 12	N = 13
Energy, kcal, Mean (SD)	1635.7 (\pm 449.8)	2055.2 (\pm 617.6)
Protein, g, Mean (SD)	45.7 (\pm 15.8)	55.6 (\pm 13.4)

Table 7 Secondary data on programme performance indicators, Andhra Pradesh

Indicator	April 2014– March 2015	April 2015– March 2016	April 2016– March 2017	April 2017– August 2017
Number of days women ate the meal in a month				
N	543	520	583	211
Mean (SD)	17.0 (±6.7)	17.8 (±7.9)	20 (±6.5)	19 (±6.7)
Weight gain (kg) during pregnancy (2nd to 9th month)				
N	44	71	230	140
Mean (SD)	8.3 (±2.7)	9.7 (±2.2)	8.9 (±2.9)	9.1 (±1.9)
<10 kg (%)	72.7	43.7	48.2	43.4
Birthweight (kg)				
N	450	458	437	185
Mean (SD)	2.8 (±0.6)	2.8 (±0.6)	3.0 (±0.2)	3.0 (±0.3)
Low birthweight (<2.5 kg)	4.0	3.3	1.6	2.1
Improvement in haemoglobin level by months of participation in the programme				
3 months	N = 67	N = 14	N = 16	N = 17
Haemoglobin at time of entry (mean SD)	8.6 (±1.3)	9.1 (±0.7)	9.0 (±1.4)	8.0 (±1.0)
Haemoglobin at last reading (mean SD)	8.7 (±1.6)	9.7 (±0.6)	9.7 (±2.0)	9.1 (±1.4)
4–5 months	N = 309	N = 322	N = 74	N = 46
Haemoglobin at time of entry (mean SD)	8.9 (±1.2)	8.8 (±1.3)	8.2 (±1.8)	8.8 (±1.1)
Haemoglobin at last reading (mean SD)	9.1 (±1.2)	9.0 (±1.3)	9.0 (±1.8)	9.4 (±2.5)
6 or more months	N = 263	N = 278	N = 242	N = 221
Haemoglobin at time of entry (mean SD)	9.4 (±1.1)	9.2 (±1.4)	8.9 (±1.1)	8.9 (±1.2)
Haemoglobin at last reading (mean SD)	9.9 (±1.3)	9.8 (±1.5)	10.1 (±1.7)	9.9 (±2.2)
Nutrition and Health Days held in last month at anganwadi centre				
Anganwadi centre (N)	85	78	*	*
One (%)	89.4	89.7	*	*
Two (%)	61.2	65.4	*	*
None (%)	10.6	10.3	*	*

*disaggregated data not available

TELANGANA

Table 8 Sample characteristics, Telangana (N=360)

Sample characteristics	
Age in years (mean SD)	22.8 (\pm 3.0)
Pregnant (%)	51.1
Lactating (%)	48.9
Age (years) at first pregnancy (mean SD)	20.6 (\pm 2.6)
Age (years) at first pregnancy less than 20 years (%)	29.5
Religion (%)	
Hindu	89.2
Muslim	3.6
Others*	7.2
Caste (%)	
Scheduled caste	19.4
Scheduled tribe	26.4
Other backward class	47.5
Others	6.7
Has never attended school (%)	8.6
Practice open defecation (%)	40.3
Unprotected drinking water source (%)**	22.2
Member of a self-help group (%)	31.4
Anthropometry	N = 180
Height less than 145 cm (%)	8.3
Mid-upper arm circumference less than 23 cm (%)	22.2
Mid-upper arm circumference less than 21 cm (%)	11.7
Mid-upper arm circumference (cm) (mean \pm SD)	24.5 (\pm 3.4)

* Jainism, Sikhism and Buddhism.

** Tube well or borehole, unprotected dug well, rainwater collection, tanker/truck, cart with small tank, surface water (river, dam, lake, pond, stream, canal, irrigation canal).

Table 9 Receipt of services from Arogya Lakshmi scheme, Telangana (N=360)

As reported by the beneficiaries	%
Decision to take Arogya Lakshmi meal	
Self	24.2
Self-help group member	65.3
Family member	10.6
Perception – meal is sufficient in quantity	96.7
Perception – meal is adequate in taste	97.8
Place of iron folic tablet consumption	
At anganwadi centre	13.8
At home	86.0
Did not take	0.3
Have mother child protection card	90.3
Received deworming tablets	55.0
Received calcium tablets	92.5
Received medicated mosquito net	20.0
Received advice on family planning	42.2
Consumed alcohol and/or tobacco while pregnant	10.3
Use iodized salt at home	89.2
Received at least one nutrition counselling session in last month	97.8

Table 10 Maternal dietary diversity, Telangana

	Pregnant N=93 %	Lactating N=87 %
Type of food groups consumed		
Grains/white tubers	98.9	100.0
Pulses, beans or peas	91.4	77.0
Nuts or seeds	34.4	24.1
Milk or milk products	94.6	98.9
Meat, poultry, seafood or animal product	25.8	14.9
Eggs	88.2	78.2
Dark green vegetables	61.3	57.5
Yellow fruits/vegetables (vitamin A rich)	35.1	40.7
Other vegetables	96.8	92.0
Other fruits	44.1	32.2
No. of food groups consumed		
1	0	0
2	0	1.2
3	0	3.4
4	5.4	4.6
5	0	11.5
6	24.7	28.7
7	31.2	25.3
8 or more	38.7	25.3
Minimum dietary diversity*	94.9	90.8

* A diverse diet is one in which five or more food groups are represented as per FAO (2016) criteria.

Table 11 Protein and energy consumption of women based on 24-hour dietary recall method, Telangana

	Pregnant	Lactating
Recommended daily dietary allowance (moderate worker)	Energy: 2580 kcal Protein: 78 g	Energy: 2830 kcal Protein: 74 g
Consumption		
Based on meal eaten at site and at home	N = 28	N = 32
Energy, kcal, Mean (SD)	2649.7 (\pm 810.9)	2816.5 (\pm 658.8)
Protein, g, Mean (SD)	77.8 (\pm 26.7)	84.0 (\pm 21.3)
Based on meal eaten at home	N = 28	N = 32
Energy, kcal, Mean (SD)	1870.6 (\pm 747.9)	1969.3 (\pm 562.4)
Protein, g, Mean (SD)	50.9 (\pm 24.0)	55.2 (\pm 18.6)
Based on meal eaten at site	N = 28	N = 32
Energy, kcal, Mean (SD)	784.1 (\pm 324.6)	854.6 (\pm 350.3)
Protein, g, Mean (SD)	31.8 (\pm 19.1)	31.8 (\pm 44.7)
Based on Sunday meal	N = 17	N = 13
Energy, kcal, Mean (SD)	2464.4 (\pm 778.5)	2546.6 (\pm 797.7)
Protein, g, Mean (SD)	82.4 (\pm 38.1)	72.2 (\pm 28.2)

Table 12 Food security and coping mechanisms, Telangana (N=360)

Indicator	%
Affirmative responses, prefixed with 'within last 12 months'	
Worried about getting enough food to eat (sometimes/always)	18.1
Unable to eat nutritious food due to lack of money	28.1
Ate only few foods due to lack of money	44.2
Had to skip a meal due to lack of money	8.1
Ate less than should due to lack of money	31.1
Household ran out of food due to lack of money	11.7
Were hungry but did not eat	9.2
Did not eat for a whole day and night	5.6
Raw score (affirmative response)	
0	41.2
1	17.5
2	13.6
3	13.9
4	4.2
5	1.9
6	2.2
7	1.4
8	2.5
Food security	
Food secure (raw score 0–3)	87.8
Moderately food insecure (raw score 4–6)	8.3
Severely food insecure (raw score 7–8)	3.9
Coping behaviours, prefixed with 'unlike earlier'	
Household head works overtime	45.8
Female(s) of household work outside the home	45.3
Children of household work outside home	6.4
Family member has had to migrate to earn money	10.6
Borrowed money to meet household expenses	63.6
Used low-cost food grains/items	69.4
Borrowed grains to meet food requirements	44.0
Household articles or possessions sold	20.9

'Money' as used in this Table paraphrases 'money and resources'.

Table 13 Comparison of selected indicators of tribal and rural sites, Telangana

Indicator	Rural sites	Tribal sites
Demographic characteristics	N = 216	N = 144
Age in years (mean SD)	23.2 (±3.2)	22.4 (±2.7)
Pregnant (%)	50.9	50.0
Lactating (%)	49.1	50.0
Age at first pregnancy (mean SD)	20.6 (±2.7)	20.8 (±2.3)
Has never attended school (%)	7.9	9.7
Practice open defecation (%)	42.6	36.8
Member of a self-help group (%)	33.3	28.5
Anthropometry	N = 108	N = 72
Height less than 145 cm (%)	12.0	2.8
Mid-upper arm circumference less than 23 cm (%)	21.3	23.6
Mid-upper arm circumference less than 21 cm (%)	6.5	19.4
Services uptake	N = 216	N = 144
Perception – meal is sufficient in quantity	99.1	93.1
Perception – meal is adequate in taste	99.1	95.8
Place of iron folic acid tablet consumption		
At anganwadi centre	17.5	8.7
At home	82.5	91.3
Received deworming tablets	53.7	56.9
Received calcium tablets	95.4	88.2
Received medicated mosquito net	14.4	28.5
Received advice on family planning	52.8	26.4
Consumed alcohol and/or tobacco while pregnant	15.7	0.7
Use iodized salt at home	99.5	73.6
Received at least one or two counselling sessions in last month	98.1	97.2
Diet diversity (≥ 5 food groups)	88.8	98.5
Food security	N = 216	N = 144
Moderately food insecure (raw score 4–6)	6.9	10.4
Protein energy consumption by pregnant women		
Based on meal eaten at site and at home	N = 15	N = 13
Energy, kcal, Mean (SD)	2641.4 (±700.2)	2659.3 (±952.6)
Protein, g, Mean (SD)	72.9 (±23.1)	83.3 (±30.4)

Table 13 (contd.)

Indicator	Rural sites	Tribal sites
Based on meal eaten at home	N = 15	N = 13
Energy, kcal, Mean (SD)	1801.6 (\pm 634.2)	1950.2 (\pm 881.2)
Protein, g, Mean (SD)	45.5 (\pm 19.8)	57.2 (\pm 27.6)
Protein energy consumption by lactating mothers		
Based on meal eaten at site and at home	N = 15	N = 17
Energy, kcal, Mean (SD)	2459.9 (\pm 614.0)	3131.2 (\pm 535.3)
Protein, g, Mean (SD)	69.0 (\pm 15.8)	97.2 (\pm 16.3)
Based on meal eaten at home	N = 15	N = 17
Energy, kcal, Mean (SD)	1577.5 (\pm 392.9)	2314.9 (\pm 454.9)
Protein, g, Mean (SD)	41.0 (\pm 9.8)	67.8 (\pm 15.1)

Table 14 Secondary data on programme performance indicators, Telangana

Indicator	April 2014– March 2015	April 2015– March 2016	April 2016– March 2017	April 2017– August 2017
Number of days women ate the meal in a month				
N	520	519	526	355
Mean (SD)	21.1 (±3.6)	20.8 (±3.8)	21.6 (±4.3)	22.6 (±1.2)
Weight gain (kg) during pregnancy (2nd to 9th month)				
N	65	74	79	71
Mean (SD)	8.9 (±2.4)	9.5 (±3.4)	8.7 (±3.8)	9.6 (±3.9)
<10 kg (%)	63.1	50.0	61.0	48.0
Birthweight (kg)				
N	470	485	613	276
Mean (SD)	2.9 (±0.5)	2.9 (±0.5)	3 (±0.2)	3 (±0.2)
Low birthweight (<2.5 kg) (%)	2.6	4.7	2.0	3.0
Improvement in haemoglobin level by months of participation in the programme				
3 months	N = 37	N = 48	N = 28	N = 21
Haemoglobin at time of entry (mean SD)	8.6 (±0.9)	9.4 (±2.0)	9.2 (±1.0)	9.0 (±0.4)
Haemoglobin at last reading (mean SD)	8.7 (±0.9)	9.6 (±2.1)	9.6 (±0.2)	10.7 (±1.0)
4–5 months	N = 167	N = 158	N = 287	N = 186
Haemoglobin at time of entry (mean SD)	9.0 (±1.0)	9.3 (±1.5)	9.1 (±1.8)	9.0 (±0.3)
Haemoglobin at last reading (mean SD)	9.1 (±1.0)	9.5 (±1.6)	10.0 (±1.4)	10.7 (±1.0)
6 or more months	N = 157	N = 144	N = 288	N = 186
Haemoglobin at time of entry (mean SD)	9.3 (±1.0)	9.8 (±1.6)	9.1 (±1.5)	9.0 (±0.3)
Haemoglobin at last reading (mean SD)	10.0 (±1.1)	10.5 (±1.7)	10.1 (±1.6)	10.7 (±1.0)
Nutrition and Health Days held in last month at anganwadi centre				
Anganwadi centre (N)	70	67	60	60
One (%)	85.7	92.5	98.1	96.2
Two (%)	62.9	65.7	84.2	80.0
None (%)	14.3	7.5	6.0	6.0

Table 15 Summary of stakeholder views

Consultant	<p>What’s working</p> <ul style="list-style-type: none"> ● Providing daily egg and milk has improved attractability of programme. ● Providing DOT iron and folic acid has increased its consumption.
	<p>What’s not working</p> <ul style="list-style-type: none"> ● For a few women, distance, timings and locality of the anganwadi centre are preventing them from coming and taking the meal. ● Initially, milk and vegetables were being supplied by village organizations. Due to some administrative problems, this function was later transferred to the anganwadi worker, making it difficult for her to manage it alone. ● Additionally, providing the meal and also counselling becomes a challenge as timing is limited. ● In some sites, there is no weekly supply of eggs (which is to be supplied by contractors). ● Given that IFA supply has to be provided by health department, the DOT supplementation becomes a challenge if the supplies are not in place. ● Provision of non-polished rice is not well received.
	<p>Recommendations for future</p> <ul style="list-style-type: none"> ● Introduce fine rice. ● Increase number of computers at project site for data entry. ● Provide a two-way feedback based online for improvement. ● Train supervisors and workers on data management along with thematic trainings. ● Collect data routinely on missing pregnant mothers on qualitative aspects, which is presently not being done. ● Integrate different online applications to simplify and reduce workload of online data entry.

Table 15 (contd.)

State-level functionaries	<p>What’s working</p> <ul style="list-style-type: none"> ● Improvement in nutrition content – the state share has added eggs and milk in addition to the central share. Apart from the Government of India’s share of INR7 [before the increase in 2017], the state government incurs INR13 per beneficiary, which is helping with the supply of eggs and milk every day, increasing the protein intake and improvements in iron deficiency. ● Improvement in supply chain – Linking ration with the ADHAAR card and introducing the online system have improved the supplies with timeliness.
	<p>What’s not working</p> <ul style="list-style-type: none"> ● Involvement of contractors: Due to contractors there are bottlenecks in the supply. Efforts have been made to supply directly to fair price shops and reach AWCs through the Public Distribution System. Even this supply of commodities will be taken care of by the civil supplies corporation, which is also a government agency. Procurement of eggs through contractor and CDPOs was an issue.
	<p>Recommendations for future</p> <ul style="list-style-type: none"> ● Implement the scheme in other districts as well. ● Procure dairy products from dairy development corporation. ● Introduce biometric attendance system in all the anganwadi centres to reduce malpractices. ● Introduce review and monitoring mechanism of frontline workers in the system. ● Set up grievance and complaint redressal system and review monthly/quarterly. ● Recruit supervisors to guide the mothers and anganwadi workers. ● Introduce double fortified salt in the scheme to deal with double burden of iron deficiency anaemia and iodine deficiency. ● Implement regular refresher training of CDPOs.
District-level functionaries	<p>What’s working</p> <ul style="list-style-type: none"> ● Due to provision of meals, the antenatal care and supplementation has improved. ● The knowledge of families regarding care during pregnancy and lactation has improved as it has generated a lot of interest amongst the community.
	<p>What’s not working</p> <ul style="list-style-type: none"> ● The supply of food items to the remote tribal villages is challenging due to bad roads and transportation problems. ● Due to poor internet connectivity in tribal project areas/mandals, e-pass system access poses problems. ● The tracking of beneficiary is very challenging.
	<p>Recommendations for future</p> <ul style="list-style-type: none"> ● Strengthen AWCs, along with providing meals, and provide proper seating, electricity, fan and toilets since the women spend a few hours in preparing and having meals. ● Clarify role of self-help groups as their involvement in the programme is weak.

Table 15 (contd.)

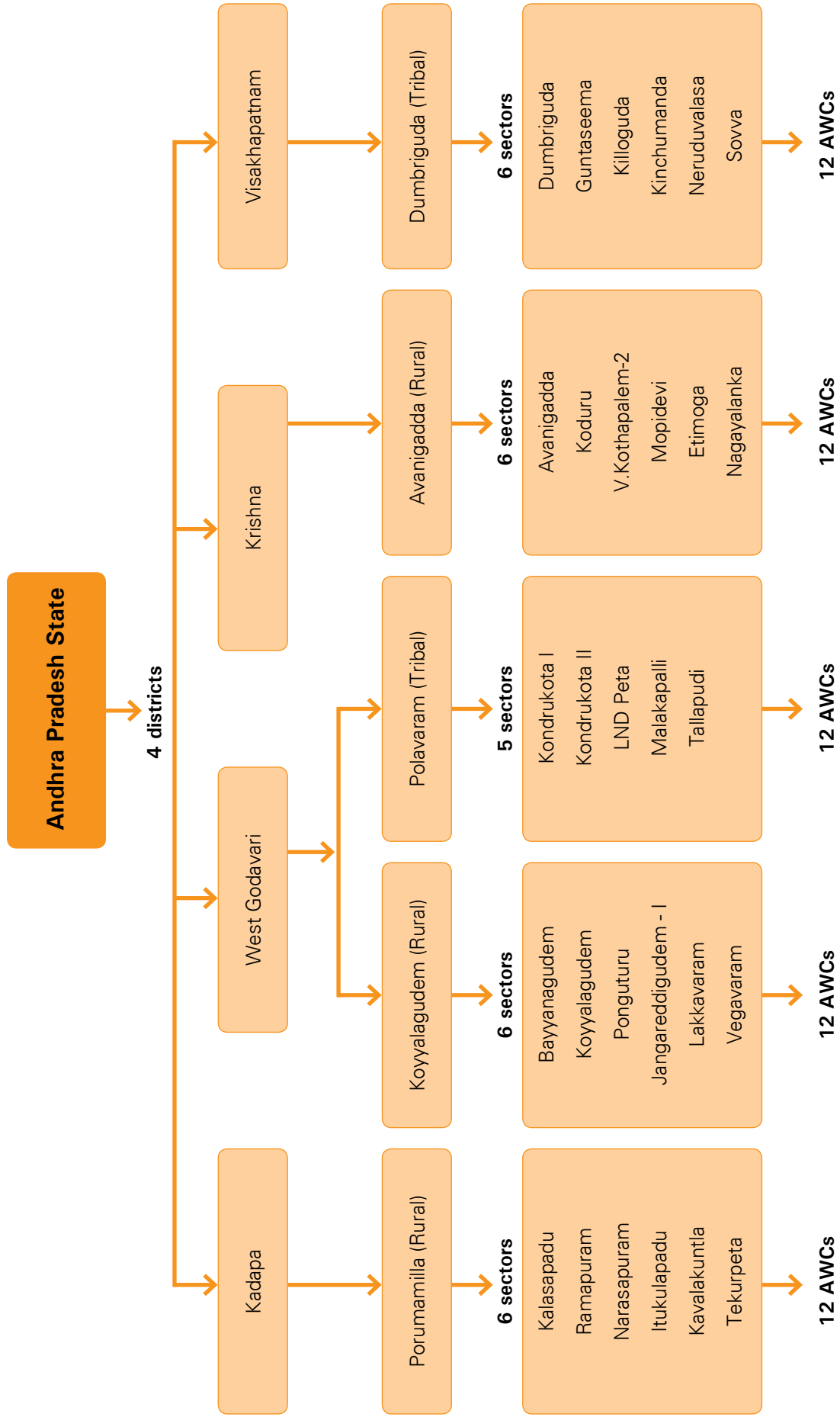
Frontline workers	<p>What's working</p> <ul style="list-style-type: none"> ● In special cases, if the pregnant woman is not in a position to attend (sick or any other personal reason), provision of the meal to her home is a good initiative. ● Due to One Full Meal, the supply procurement responsibilities have been made clear. ● The attendance to the scheme has improved due to counselling and additional activities, like rallies, baby shower, birthday celebrations, as they are attractive to the beneficiaries. The meetings/programmes conducted by AWWs and supervisors motivate the beneficiaries.
	<p>What's not working</p> <ul style="list-style-type: none"> ● Timeliness and inadequacy of funds and supplies is a major problem faced. ● Quality of the rice and egg is also poor.
	<p>Recommendations for future</p> <ul style="list-style-type: none"> ● Provide home augmented food to pregnant women and lactating mothers. ● Provide drinking water and toilet facility in anganwadi centres. ● Provide adequate quantity and improve quality of food (fruits, eggs and milk) to the anganwadi centres. ● Improve the infrastructure of anganwadi centres. ● Train frontline workers and other staff regularly on One Full Meal scheme.



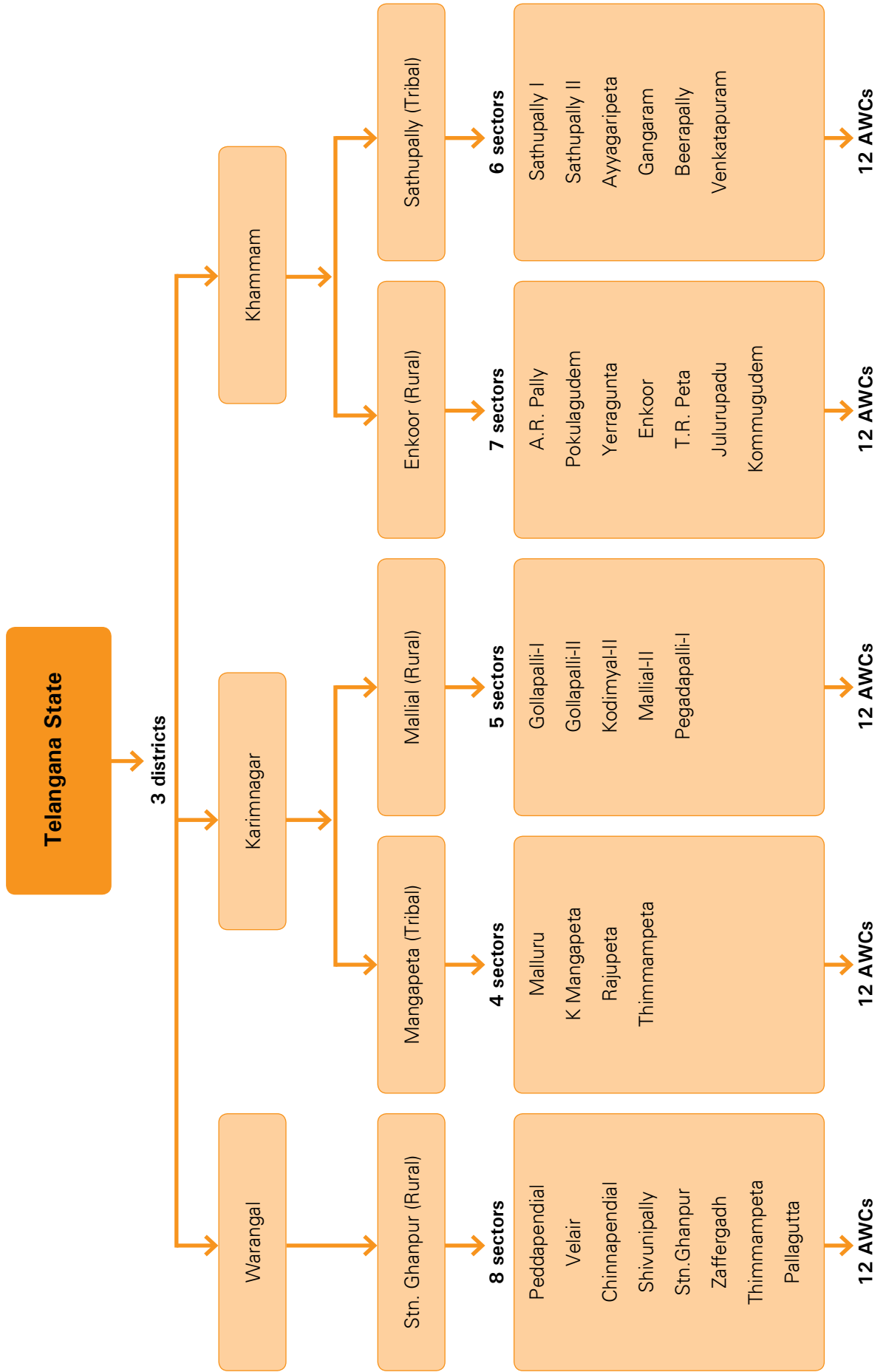
©UNICEF/UNI175901/Singh

APPENDICES

Appendix 1 Sampling for Andhra Pradesh



Appendix 2 Sampling for Telangana



Appendix 3 Nutritive values of food items and costs of Anna Amrutha Hastham scheme, Andhra Pradesh

No.	Item	Quantity	Cost at present rates (INR per head)	Nutritive value		
				Energy (kcal)	Protein (g)	Calcium (mg)
1	Rice/wheat/millets, etc.	125 g	0.5	431.3	8.5	12.5
2	Dhal (red gram/ green gram)	30 g	2.1	104.4	7.2	22.5
3	Oil	16 g	1.0	144.0	–	–
4	Transport		0.1			
5	Cooking		0.3			
6	Milk	200 ml	5.6	234.0	8.6	420.0
7	Egg	1 (50 g)	3.5	86.5	6.6	30.0
8	Vegetables (leafy vegetables, potatoes, onions, beans, etc.)	50 g	1.4	52.5	1.8	16.1
9	Condiments		0.5			
	Total		15.0	1052.7	32.8	501.1

Appendix 4 Nutritive values of food items and costs of Arogya Lakshmi scheme, Telangana

No.	Item	Quantity	Cost at present rates (INR per head)	Nutritive value		
				Energy (kcal)	Protein (g)	Calcium (mg)
1	Rice	150 g	0.6	517.6	10.2	15.0
2	Dhal (Red gram)	30 g	2.6	104.4	7.3	22.5
3	Oil	16 g	1.1	144.0	0.0	0.0
4	Transport		0.1			
5	Cooking		0.3			
6	Milk	200 ml	9.9	273.0	10.03	490.0
7	Egg	1 (50 g)	4.2	100.92	7.76	35.0
8	Vegetables (leafy vegetables, potatoes, onions, beans etc)	50 g	1.5	52.50	1.80	16.1
9	Condiments		0.6	0.00	0.00	0.0
	Total		21.0	1192.4	37.0	578.6

ACKNOWLEDGEMENTS

Conceptualization, data analysis and writing

Dr. Vani Sethi	Nutrition Specialist, UNICEF India Country Office, New Delhi
Dr. Laxmi Bhavani	Chief of Office, UNICEF Gujarat Field Office, Gandhinagar
Dr. Khyati Tiwari	Nutrition Specialist, UNICEF State Office for Andhra Pradesh and Karnataka, Hyderabad
Dr. H.P.S. Sachdev	Senior Consultant Paediatrics and Clinical Epidemiology, Sitaram Bhartia Institute of Science and Research, New Delhi

Study design – review and advisory support

Viziendira Boyi, I.A.S.	Director, Women Development and Child Welfare, Telangana
Dr. Abner Daniel	Nutrition Specialist, UNICEF Field Office of Chhattisgarh, Raipur
Deepak Dey	Social Policy and Planning Specialist, UNICEF State Office for Andhra Pradesh and Karnataka, Hyderabad
M. Jagadeeshwar, I.A.S.	Secretary to Government, Women, Children, Disabled and Senior Citizens, Telangana
H. Arun Kumar, I.A.S.	Special Commissioner, Women Development and Child Welfare, Andhra Pradesh
Geeta Trilok Kumar	Associate Professor, Department of Food and Nutrition, Lady Irwin College, New Delhi
Prof. S. Vijay Kumar	Professor, Centre for Economic and Social Studies, Hyderabad
Dr. A. Laxmaiah	Scientist 'F' & HoD, Division of Community Studies, National Institute of Nutrition, Hyderabad
James Levinson	Independent Consultant
K. Sunitha, I.A.S.	Secretary to Government, Women, Children, Differently Abled and Senior Citizens, Andhra Pradesh
Dr. Harriet Torlesse	Regional Nutrition Advisor, UNICEF Regional Office for South Asia, Kathmandu
Arjan de Wagt	Chief of Nutrition, UNICEF India Country Office, New Delhi

Study design, tool development, data collection and data management

Amaltas Consulting Pvt Ltd, New Delhi

Dr. Suneeta Singh	Chief Executive Officer
Dr. Chittaranjan Mishra	Research Officer
Shivanshi Kapoor	Independent Consultant
Anjali Krishan	Independent Consultant

Centre for Economic and Social Studies, Hyderabad

Prof. S. Galab	Director
Prof. S. Vijay Kumar	Professor
Dr. G. Alivelu	Associate Professor
Dr. P. Usha	Project Associate
V. Shivalkar Reddy	Independent Consultant
Rahul Sadhu	Independent Consultant
Pradeep Kumar	Independent Consultant
Narasimha Rao	Independent Consultant
Ruchi Sareen	Independent Consultant

Information and editorial support

Dr. Neha Sareen	Independent Consultant
Dr. Aarati Pillai	Independent Consultant

Branding

Alexandra Westerbeek	Chief of Advocacy and Communication, UNICEF India Country Office, New Delhi
Prosun Sen	Advocacy and Communication Specialist, UNICEF State Office for Andhra Pradesh and Karnataka, Hyderabad

Photo coordination

Omesh Matta	Audio Visual Assistant, Advocacy and Communication Section, UNICEF India Country Office, New Delhi
-------------	--

Editing

Delice Gan	Consultant
------------	------------

Layout and pre-press production

New Concept	Design agency
-------------	---------------



UNICEF
UNICEF House
73, Lodi Estate
New Delhi 110003
India
www.unicef.in

©United Nations Children's Fund (UNICEF), New Delhi, India, 2017