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Documentation of Facility Based Management of Severe Acute Malnutrition in Nutrition Rehabilitation Centres in Odisha

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This report has been prepared by Amaltas, India (www.amaltas.asia). The documentation team was led by Dr Suneeta Singh and anchored by Dr Chittaranjan Mishra. Other team members who contributed to this report are Ms Falak Raza, Mr Santosh Debata (consultant) and Ms Anubha Garg. Dr Praveen Kumar, Professor, Department of Pediatrics, Lady Hardinge Medical College and associated Kalawati Saran Children's Hospital, New Delhi, independent reviewer of the documentation, provided expert advice.





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Foreword

It gives me immense pleasure to write a foreword for the Documentation of Facility based management of Severe Acute Malnutrition in Nutrition Rehabilitation Centres in Odisha undertaken by UNICEF on the request of the Government of Odisha.

Severe Acute Malnutrition has serious consequences for children – it not only leads to poor growth but also to delays in development, with consequences for the long term health of the individual. This is a scourge that must, at all costs, be removed from our state.

Facility based management of Severe Acute Malnutrition through NRCs began in 2009. By 2017, in accordance with our plans, we have been able to establish 54 fully functional NRCs in all districts of the state with 7 more currently under establishment. Facility based management of severe Acute Malnutrition had been a critical tool in our fight against malnutrition among the children of Odisha. We are now planning an active community involvement and building up a programme of community based management of Severe Acute Malnutrition or C-MAM, with UNICEF's assistance.

I commend UNICEF Odisha and Amaltas for undertaking a useful documentation that provides information on the functioning of the NRCs in the state. The documentation not only highlights the achievements of and challenges facing the NRC network of the state, it also provides way forward to make them even more effective. The discussion and recommendations of the report will be deliberated upon by the State Government.

I am sure that this document of UNICEF Odisha will contribute to further strengthening the NRC programme in the state.

With Best Wishes

Dr. Pramod Meherda





Shalini Pandit, IAS Mission Director, NHM, Odisha, Bhubaneswar

Foreword

The Health & Family Welfare Department, Govt. of Odisha has been implementing facility based management of Severe Acute Malnutrition through Nutritional Rehabilitation Centres of NRCs in Odisha since 2009. The NRC is a unit in a health Facility where children with Severe Acute Malnutrition can be admitted and managed through medical and nutritional therapeutic care. Today we have a network of 54 centres with 7 more in the final stages of being established.

This documentation by UNICEF Odisha and Amaltas provides a holistic picture of the functioning of NRCs in the State.

As Facility based management of Severe Acute Malnutrition is a critical intervention to treat children with Severe Acute Malnutrition, this documentation has provided programmatic insights that the State government can use to improve services.

The document will contribute to further strengthening the NRC programme in the State.

With Best Wishes

Shalini Pandit



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Foreword

Severe Acute Malnutrition (SAM) is a life-threatening condition for children. Children with SAM are nine times more likely to die than well-nourished children. UNICEF Odisha has been working alongside the government of Odisha since 2009 to address this through Nutritional Rehabilitation Centres (NRCs). From the establishment and operationalizing of NRCs, now numbering 54 in the state, to capacity building of NRC staff and review of data, the facility-based management of SAM through NRCs has remained a very important part of UNICEF's efforts towards curbing under nutrition of children in Odisha.

It is very timely that the government of Odisha's efforts in NRCs are analysed and documented now by Amaltas, a third party. It is very encouraging to learn that Odisha's NRC have been functioning mostly well and that children with SAM have indeed benefitted from the services. The documentation also gives us an important glimpse into the particular nutrition vulnerabilities of children of tribal communities, reconfirming the urgency to support food and nutrition security in the tribal areas. On this and a concrete set of recommendations to narrow the gaps in NRC's effective implementation, UNICEF remains committed.

I sincerely thank Amaltas for carrying out an objective and quality analysis of the NRC's in Odisha. I thank the Government of Odisha for initiating this documentation with UNICEF and wholeheartedly embracing the findings and recommendations for further action to strengthen the facility- based management of severe acute malnutrition in children.

Yumi Bae

Acknowledgement

AMALTAS

Severe Acute Malnutrition (SAM) places extraordinary challenges in the way of survival, growth and development of the child under five years of age. In Odisha, facility based management of SAM through Nutritional Rehabilitation Centres (NRC) has been an important intervention to treat children with SAM. This documentation has been undertaken to assess the status of functioning and understand bottlenecks and good practices of facility based management in the state.

The study is intended to provide insights to the Government of Odisha on strengthening facility based management of children with SAM. Ms Arti Ahuja, Principal Secretary (Former), Department of Health and Family Welfare, Government of Odisha and Mr. Prasanth Kumar Reddy, Director, Department of Women and Child Development, Government of Odisha were kind enough to provide their valuable inputs. We are grateful to the support received from Mr. Jagabandhu Bhoi, State Data Manager, SMCS Cell (Office of Department of Family Welfare), Odisha for providing the Monthly Progress Report data sets.

The Amaltas team would like to acknowledge the support of Dr. Praveen Kumar Professor, Department of Pediatrics, Lady Hardinge Medical College and associated Kalawati Saran Children's Hospital, New Delhi who, as an Independent Reviewer, reviewed the study design and tools in the early stages of the assignment and subsequently provided technical inputs to finalise the findings.

We are thankful to the officials from the departments of Health and Family Welfare, and Women and Child Development, at the district level who generously shared their views for this documentation. We would like to thank the staff of the NRCs visited, for sparing their time to interact with the study team members. The effort undertaken by the ANMs, AWWs, and ASHAs who travelled from various places to participate in the focus group discussions is gratefully acknowledged.

We are immensely grateful to the UNICEF Odisha nutrition team and the nutrition consultants who supported in conceptualizing the documentation and also provide support during the data collection.

Lastly and most importantly, we would like to thank the mothers and children present at the NRC who shared their personal experiences which forms the bedrock of the study. We hope that the study will provide the evidence base to intensify efforts to improve the lives of mothers and children in Odisha.

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Acronyms

ANM	Auxiliary Nurse Midwife
APR	Annual Progress Report
ASHA	Accredited Social Health Activist
AWC	Anganwadi Centre
AWW	Anganwadi Worker
BOR	Bed Occupancy Rate
САВ	Clinical, Anthropometric and Biochemical Survey
СНС	Community Health Centre
СМАМ	Community-based Management of Acute Malnutrition
DEIC	District Early Intervention Center
DHH	District Headquarter Hospital
DM	District Magistrate
DoHFW	Department of Health and Family Welfare
DWCD	Department of Women and Child Development
FGD	Focus Group Discussion
	Integrated Child Development Scheme
	In-Depth Interview
	Infont Mortality Pata
	Integrated Tribel Development Area
	Integrated Indai Development Area
	Length of Stay
	Maternal Mortality Rate
MOHEVV	Ministry of Health and Family Welfare
MWCD	Ministry of Women and Child Development
MPR	Monthly Progress Report
MUAC	Mid-Upper Arm Circumference
NA	Nursing Assistant
NC	Nutritionist cum Counsellor
NFHS	National Family Health Survey
NHM	National Health Mission
NRC	Nutrition Rehabilitation Centre
NRHM	National Rural Health Mission
OPD	Out-Patient Department
PHC	Primary Health Center
10QAT-CU	10 Question Assessment Tool for Current Users
10QAT-FU	10 Question Assessment Tool for Follow-up Users
QoC	Quality of Care
RBSK	Rashtriya Bal Swasthya Karyakram
RSOC	Rapid Survey of Children
RUTF	Ready-to-UseTherapeutic Food
SAM	Severe Acute Malnutrition
SC	Scheduled Caste
SDH	Sub-Divisional Hospital
ST	ScheduledTribe
UNICEF	United Nations Children's Fund
VHND	Village Health and Nutrition Day
WHO	World Health Organization
WHZ	Z-score of Weight-for-Height
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Glossary

Bed Occupancy Rate	Total number of inpatient days for a given period divided by available beds, multiplied number of days in the same period. Expressed as a percentage.
Average Length of Stay	Sum of the number of days of stay in the NRC of all discharged children divided by the number of all discharged children.
Discharged recovered rate (Recovery rate)	Number of children discharged with ≥15% weight gain during a given period, divided by total exits in the same period. Expressed as a percentage.
Discharged unrecovered rate	Number of children discharged with <15% weight gain during a given period, divided by total exits in the same period. Expressed as a percentage.
Defaulter	Child admitted to the NRC but absent from the NRC for three consecutive days without having been discharged.
Defaulter rate	Number of admitted children that defaulted during a given period, divided by total number exits in the same period. Expressed as a percentage.
Relapse	Patient who has been discharged as cured from the programme within the last 2 months but is once again eligible for admission to NRC.
Death rate	Number of deaths of SAM children for a given period, divided by total number of exits in the same period. Expressed as a percentage.
Manpower Index	Scores assigned to availability and training of Manpower. Score for Availability: MO=n*1; NC=n*1; ANM=n*0.25; Cook- cum-attendant=n*0.66. Score for Training: MO=n*1; Counsellor=n*1; ANM=n*0.25
	Individual scores summed, to a base of 10.
Index of Measuring Instruments	Scores assigned to each of 6 Measuring Instruments on availability and functionality. Score for Availability: For each, n*1. Score for Functionality: For each, n*1. Individual scores summed, to a base of 10.
Index of Kitchen Equipment	Scores assigned to each of 8 Kitchen Equipment on availability and functionality. Score for Availability: For each, n*1. Score for Functionality: For each, n*1. Individual scores summed, to a base of 10.
Index of Medicines	Scores assigned to each of 12 Medicine items on availability. Score for Availability: For each, n*1. Individual scores summed, to a base of 10.

Index of Essential Charts	Scores assigned to each of 4 types of Essential Charts on availability. Score for Availability: For each, n*1. Individual scores summed, to a base of 10
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Effectiveness Index	Scores assigned to each of 6 variables based on being practiced/ present in the NRC. Scores for being practiced/ present: For each, n*1. Individual scores summed, to a base of 10.
Efficiency Index	Scores assigned to bed occupancy rate and recovery rate. Score for Bed Occupancy Rate: Score=1 if BOR of NRC \geq 100%. Score for Recovery Rate: Score=1 if recovery rate of NRC \geq 75% Individual scores summed, to a base of 10.
Equity Index	Scores assigned on basis of difference of proportion of SC population and SC admissions, and difference of proportion of ST population and ST admissions. Score for SC proportion: Score=1 if % SC admissions in NRC higher than % SC population in the district. Score for ST proportion: Score=1 if % ST admissions in NRC higher than % ST population in the district. Individual scores summed, to a base of 10.
Safety Index	Scores assigned to each of 7 variables based on being practiced/ present in the NRC. Scores for being practiced/ present: For each, n*1. Individual scores summed, to a base of 10.
Patient Centeredness Index	Scores assigned to each of 7 variables based on being practiced/ present in the NRC. Scores for being practiced/ present: For each, n*1. Individual scores summed, to a base of 10.

Background

- 1. Undernutrition results in adverse physical, cognitive and/or emotional results in the short term as well as in the long-term health and well-being of an individual. Its deleterious effects on the collective health of society are well recognised, and undernutrition is taken to be an indication of a society's wellbeing. Severe Acute Malnutrition (SAM) places extraordinary challenges in the way of survival, growth and development of children under five years of age. Despite improvements in food production, Odisha's under-five population of approximately 3.7 million continues to be at risk of SAM.
- Treatment of children with SAM takes one of two forms; facility based with in-patient care and community based on an out-patient basis. Facility based models are in wide usage in India. Facility based management of SAM is led by the Ministry of Health and Family Welfare, Government of India under its National Rural Health Mission (NRHM).
- 3. Facility based management takes place in a Nutritional Rehabilitation Centre (NRC), a unit in a health facility, where children with SAM are admitted and managed through medical and nutritional therapeutic care. Operational Guidelines issued by the Department of Health and Family Welfare (DoHFW), Government of Odisha provide admission and discharge criteria for children with SAM. The Guidelines also specify the Quality of Care (QoC) standards for several aspects of the NRCs' functioning, such as manpower, infrastructure and administration, among other aspects.
- The SAM programme in Odisha began in 2009 with the establishment of NRCs in Kalahandi and Mayurbhanj

districts in 2009. Between 2009 and 2017, the Government of Odisha has set up a total of 54 NRCs across all districts and 7 more are currently under establishment. At the time of data collection for documentation, 46 NRCs were functioning.

5. United Nations Children's Fund (UNICEF) has been providing technical support on SAM management in India. UNICEF is collaborating with the Government of Odisha to establish and strengthen facility- based care and support for children with SAM by supporting NRCs in the state. Tasks undertaken by UNICEF include: support to district administration in establishing and operationalizing NRCs; capacity building of NRC staff, supervisory and frontline workers; and maintaining data quality by providing technical support to standardize reporting formats for NRCs.

Objectives & Methodology

- The main objectives of this documentation were to: assess the status of functioning of facility based management of children with SAM in Odisha; identify bottlenecks and good practices in facility based management of SAM; and propose recommendations for addressing bottlenecks and strengthening the programme.
- 7. Broad areas of documentation include: trend of NRC process indicators such as bed occupancy, referral rate, weight gain, length of stay, and follow-up of discharged cases; trends in key exit indicators such as recovery rate, defaulter rate and case fatality rate; status of NRC resources such as manpower, measuring instruments, kitchen equipment, essential charts, medicines, and records; and QoC at NRCs.

- 8. The documentation adopts a mixed methods approach, in which a mix of quantitative and qualitative methods was used to collect the primary data. Data from primary and secondary sources was analysed to arrive at the findings. Triangulation helped to delineate findings on status of functioning of the NRCs, demand and supply side factors impeding the fullest use of the NRCs, what works well and what does not work as well, and key learning.
- 9. Six NRCs a well performing and a not so well performing from each division of the state - were identified on the basis of NRC outcome data in the April 2015 – March 2016 Annual Progress Report (APR). In-depth interviews(IDIs) were conducted with NRC staff, i.e. the Medical Officer (MO), Nutritionist cum Counsellor (NC), Auxiliary Nurse Midwives (ANMs) and Cook-cum-attendants, and mothers/ caregivers who had come for follow-up visits. Focus Group Discussions (FGDs) were conducted with the mothers/ caregivers of current users of NRC and with frontline workers such as ANMs, Anganwadi Workers (AWWs) and Accredited Social Health Activists (ASHAs). To capture the broader picture, IDIs were conducted with the state and district level Health & Women and Child Development officials and staff of UNICEF. Data collection in NRCs took place in September 2016.
- 10. In all the 46 NRCs, data were collected from mothers/caregivers at the NRC during data collection by using a 10 Question Assessment Tool (10QAT). In addition, data on a QoC checklist was collected from these NRCs by UNICEF RDC consultants.Data collection by themtook place in October - November 2016.Frequency analysis of 10QAT data

was done in Excel on the indicators of interest. Data on the QoC checklist was analysed to understand key aspects of the functioning of NRCs. Five indices of QoC were developed to capture the effectiveness, efficiency, equity, patientcenteredness, and safety at each NRC.

 Quantitative analysis of secondary datasets included analysis of 2 years of APR data and Monthly Progress Report (MPR) database of 10 NRCs for indicators of interest. Advanced analysis of datasets was carried out in Excel to present the findings.

Results

Status on Admission and Bed Occupancy Rate

- 12. As per the APR,there were on average 6359 SAM admissions per year in the state. This accounts for 2.0% of the estimated annual case load of SAM in Odisha.
- There was an increase of 812 admissions of SAM children between FY2014-15 and FY2015-16.Of the 12,718 SAM children admitted in the 2 years, 53.4% were girls while 46.6% were boys. The distribution by age group was 11.7% (0-5 months), 62.1% (6-23 months) and 26.2% (24-59 months). In terms of social group, 21.1% of admitted children were from scheduled castes (SC), 55.7% from scheduled tribes (ST), and 23.1% from other social groups.
- 14. As per the APR data, the average Bed Occupancy Rate (BOR) for the state has increased from 56.6% in FY2014-15 to 61.4% in FY2015-16. There are 3 NRCs each in FY2014-15 and FY2015-16 which have a BOR of more than 100%. In 15 out of 43 NRCs, BOR is more than state average consistently over the 2 years. In

23 NRCs, the BOR has consistently been less than the state average over the 2 years.

- 15. APR data shows that of the 18 NRCs located in Integrated Tribal Development Areas(ITDA), 11 NRCs have performed consistently better than the state average over the 2 years. Of the 25 NRCs in non-ITDA area, only 4 NRCs had a BOR better than the state average during the same time period.
- 16. The analysis of MPRdata of 10 NRCs for 24 months (April 2014 - March 2016) shows that 2.0% of admitted children had bilateral oedema.Of the total 3124 SAM children admitted, 41% children were ≤ -4SD.
- 17. Analysis of MPR data suggests that there was a seasonal variation in admissions to NRCs. The highest number of admissions took place in May (317) and June (318), considered the lean season for agricultural work. The lowest number of admissions took place in November (221), December (226) and January (231), the paddy-harvesting season in the state.
- 18. Analysis of MPR data of admitted cases by the area of origin indicates that 32.8% SAM cases originate from the same block in which the NRC is located, 45.9% come from the neighbouring blocks, 17.5% from other blocks, and 3.8% from other districts. Analysis by source of referral found that 46.6% cases were referred by frontline workers (AWW, ANM, ASHA), 24.6% by MO- any Out-Patient Department (OPD), 14.9% by others, and 7.9% cases from PushtikarDiwasbeing held at the time.

Status on Exit indicators

 APR data shows that in FY2014-15& FY2015-16, 88.2% of the total exits (11,688) were 'discharged'. Further analysis showed that NRCs located in ITDA areas had a discharge rate of 89.5% and those in non-ITDA areas had a discharge rate of 87.9%.

- 20. The same data shows that 80.7% of exits were discharged 'recovered' with a weight gain of ≥15% during the 2 year period. Year wise analysis showed that recovery rate rose marginally from 79.3% in FY2014-15 to 81.9% in FY2015-16. During the 2 year period, 29 of 45 NRCs reached the acceptable recovery rate of ≥75% and the remaining 16 NRCs were not able to reach the acceptable recovery rate.
- 21. Of the exits, 7.4% were discharged unrecovered; this was the same in both FY2014-15& FY2015-16. NRCs located in ITDA areas had a lower discharged unrecovered rate of 5.7% children were discharged than NRCs in non-ITDA areas (9.2%).
- 22. About 11.7% (1368) of exits were 'defaulters' during the 2 years. The default rate has fallen from 13.0% (706 out of 5413 cases) in FY2014-15 to 10.5% (662 out of 6275 cases) in FY2015-16. APR data for 2 years combined showed that in 31 of 45 NRCs, the defaulter rate is below the acceptable level of 15%. The defaulter rate was 10.4% in NRCs located in ITDA area and 12.0% in NRCs from non-ITDA area.
- 23. The APR data shows that death rate in the 2 years was 0.1% (17). The death rate for FY2014-15 was 0.2% (13) and for FY2015-16 was 0.1% (4). The death rate is much lower than the denoted acceptable level of national and international standards of care of 5%.
- 24. Analysis of detailed MPR data indicates that the average weight gain of discharged children was 9.6 g/kg body weight per day. This is higher than the national and international standards of care for minimum average weight gain (≥8g/kg body weight per day).Average weight gain was 8.2 g/kg body weight per day in NRCs in ITDA areas and 10.7g/ kg body weight per day in NRCs in non-ITDA areas. Further analysis showed that the average weight gain per day (g/

kg body weight) was 11.2 for discharged 'recovered' and 9.1 among discharged 'unrecovered'.

- 25. The average Length of Stay (LOS)was
 15 days each for FY2014-15 and FY201516. LOS in NRCs located in ITDA areas
 was marginally higher than that in NRCs
 located in non-ITDA areas each year.
- 26. Of the total number of admitted children during 2 years, 8.1% (1030) cases were transferred from NRCs to another health facility for medical reasons. NRCs located at different types of health facilities had different transfer rates. 6.6% cases were transferred from NRCs at Community Health Centres (CHCs), 7.0% from NRCs at Sub-divisional Hospitals (SDHs), 8.8% from NRCs at District Headquarter Hospitals (DHH), and 18.1% from NRCs at Tertiary Hospitals.

Facilitators and barriers

- 27. The identification of children with SAM is carried out through platforms such as the monthly Village Health and Nutrition Days (VHND), and PushtikarDiwas being held at the time. Frontline workers play an important role in identification of SAM cases while conducting the VHND. Identification of SAM cases is also being carried outbyRashtriya Bal Swasthya Karyakram(RBSK)team as well.
- 28. There are barriers to the effective use of the VHND platform for identification of SAM cases at the community level. These are: low participation of mothers from families residing in distant places; motherswho go out of the home for work; and ASHAs not very keen to mobilize all the families having children below five years for VHND due to other pressing priorities.
- 29. On the health seeking behaviour, information from mothers of SAM children revealed that 51.8% of them had visited another service provider to seek the treatment of child with SAM even after being informed that the child

urgently needs admission at the NRC. Of those visited other facilities, 72.3% went to a government hospital, 13.2% went to the private hospitals/clinics, 22.0% visited jharphuk/ vaidya, and 3.8% visited other providers.

- 30. Analysis of data collected from mothers of SAM children showed that for about half (47.7%),there was no barrier to coming for treatment. Those who experienced difficulty mentioned the following reasons: 15.1% other siblings to take care of; 10.1% lack of time; 10.6% loss of income;and 1.1% NRC was too far.Only 0.8% mothers mentioned that they did not have faith in a government facility.
- 31. There was also some time gap between the identification of child with SAM and admission at the NRC. Of the 308 mothers, 47.1% said that they had admitted the childin the NRC on the day of identification, 26.3% within a few days, 8.1% after a week, 18.5% after 15 days of advice. Approximately 9.7% of children were admittedas long as more than a month after advised to be admitted to the NRC.
- 32. Reasons for the delay in taking admission at the NRCs were: mothers had to make alternative arrangements to take care of other siblings; mothers subsisting on daily wage labour prefer to come when no work is available to them; and the wage compensation amount of Rs. 50 per day was felt to inadequate compensation fortheir daily wages.
- 33. Regarding follow-up, more children return to the NRC for the first followup than subsequent ones, with another decline between the second and third follow-up. Several factors contribute to this: mother believes that the child has recovered; opportunity cost to mothers going for daily wage work; unavailability of a convenient mode of transportation; and unavailability of ASHA to accompany the child to the NRC

due to other engagements. Qualitative information suggests that many followup cases come back with a weight lower than when discharged. Reasons for this include: not getting adequate food at home;and neglect of the child as the parents go for daily work.

- 34. Qualitative data also pointed out supply side issues: some NRCs have space constraints; lack of computer and internet facilities in some NRCs mean that NC face problems in updating the records regularly; and outsourcing of cook-cumattendants and delays in recruitment of NCs and ANMs. Among the frontline workers, there is poor coordination on follow-up of discharged cases from NRCs. AWWs feel that it is the job of the ASHA to follow-up discharged case during home visits. ASHAs in turn felt that the AWW is equally responsible for the follow-up by ensuring their enrolment and growth monitoring of the discharged children at the Anganwadi Centre (AWC).
- 35. Convergence between the DoHFW and Department of Women and Child Development (DWCD) is mainly through the district level review meeting under the chairmanship of District Magistrate(DM). Discussion on the functioning of NRCs and operational issues also takes place during the Maternal Mortality Rate (MMR)/ Infant Mortality Rate(IMR) review meeting at district, sector level review meetings and Primary Health Centre(PHC) level review meetings. Some districts have quite irregular review meetings.

Resources at the NRCs

36. Availability of manpower at NRCs is good, with the exception of ANMs which show a 21.7% vacancy rate. Most staff have received training. The exception are MOs/ Paediatricians 24.4% of whom had not received training. Of the 46 NRCs, 11 NRCs had all manpower in position and trained.

- 37. Information on the availability and functional condition of 6 types of measuring instruments was collected: digital weighing machine, infantometer, stadiometer/ wooden height board, Mid-Upper Arm Circumference tape, glucometer, and thermometer. Measuring instruments are generally available (96.0%) and when available, usually found to be in working condition (92.1%). In all, 26 of 46 NRCs had all the 6 types of functional measuring instruments.
- 38. Data was collected on availability and functional condition of 8 types of kitchen equipment: cooking gas, dietary weighing scale, graduated measuring jar, graduated measuring spoon/cup, electric blender (or manual whisks), water filter/ RO/ Aquaguard, refrigerator and utensils. Kitchen equipment is commonly (94.0%) in place and generally in working order. In 28 of 46 NRCs, all the 8 types of kitchen equipment were available and functional.
- 39. Information were sought on the availability of 12 types of medicines under antibiotics/drugs, electrolytes & minerals, and micronutrients.Medicines are most often available (94.9%).In 29 of 46 NRCs, all the 12 types of medicines were available.
- 40. Four types of essential charts in the NRCs were checked for availability: ready reckoner on electrolytes and micronutrients; F-75, F-100 charts in the NC's room; F-75, F-100 charts in the kitchen; and weight for length/height charts.Essential Charts are mostly available (93.5%). In all, 35 of 46 NRCs had all the 4 types of essential charts.
- 41. Availability and updating of 6 types of Records were scrutinised: NRC Admission register; Discharge ticket; NRC Follow-up register; Contact information register; Child information sheet; and Monthly NRC report. Records were usually available (97.8%) and updated (95.9%). In 30 of 46 NRCs, all the 6 types of records were available and updated.

Quality of Care at NRCs

- 42. Five key characteristics of QoC were explored; these are Effectiveness, Efficiency, Equity, Patient Centeredness and Safety. Taking into account the technical aspects of NRC and quality assessment, variables in the QoC checklist were identified to map to each of these five quality parameters.
- 43. The variables used for Effectiveness are: feeds are given at the prescribed times, even on nights and weekends; children are fed with a cup; blankets are provided and children kept covered at night; weighing scales are standardized weekly; staff adjust the scale to zero before weighing; and designated kitchen area (separate from the ward and duty rooms) at NRC. On Effectiveness, 20 out of 46NRCs (43.5%) had a perfect score of 10.
- 44. The variables used for Efficiency were BOR of 100% or more and recovery rate of 75% or more.The findings showed that 3 out of 45NRCs (6.7%) achieved a perfect score of 10.
- 45. Equity took into account the proportion of admissions for SC and ST groups out of the total yearly admissions in a NRC, relative to the proportion of that subgroup (SC and ST) in the population of the district in which the NRC is located. All the 18 NRCs located in ITDA and 25 of 27 NRCs in non-ITDA area met equity criteria for ST admission. In 17 out of 45 NRCs, proportion of SC admissions are less than the proportion of district SC population.
- 46. Variables used with regard to Patient Centeredness are: surroundings welcoming and cheerful; mothers offered a place to sit and sleep; NRC has a separate area for bathing and toilets for mothers/caregivers; mothers taught/ encouraged to be involved in care; demonstration of low cost energy food with mothers/caregivers being done;

staff's consistently courteous; and play toys available. On Patient Centeredness 36 out of 46NRCs (78.3%) had a perfect score of 10.

47. On Safety, the variables used are: NRC staff wash their hands with soap before handling food; mothers wash their hands with soap after using toilet or changing diapers; trash disposed of properly; ward kept as free as possible of insects and rodents; ingredients and food kept covered and stored at the proper temperature; leftovers discarded; and dishes washed after each meal. On safety 41 out of 46NRCs (89.1%) had a perfect score of 10.

Recommendations

- 48. Strengthening of Field-Facility linkages: Frontline workers need to forge better coordination to maximize the gain from efforts on identification of SAM cases through the VHND platform. Triple A forums of the ANM, AWW and ASHA, such as those being put in place in Bihar and Uttar Pradesh, could be considered. The routinisation of a review meeting between these key functionaries will help in the identification of both growth faltering children as well as frank SAM cases. The supervision mechanism at the Integrated Child Development Scheme (ICDS) sector level should be strengthened in order to make the frontline workers more accountable.
- 49. Expansion of rehabilitation services to the community: In order to cater to the uncovered SAM population, three options should be weighed.
 Option 1 is expansion of NRC network by establishing new NRCs. Option 2 is Introduction of Community-based Management of Acute Malnutrition (CMAM) for treatment of SAM cases without medical complications. Under this community-based therapeutic care for SAM children without complications, already supported by UNICEF globally,

would become a key component of the continuum of care for children with SAM. Option 3 is introduction of intermediate level, facility-based services at 24*7 CHCs across the state.This option could leverage existing facilities available at 24*7 CHCs to treat the SAM cases without complications.

- 50. Expansion of services in tribal areas: In order to respond to the higher prevalence of SAM, tribal areas should be prioritised over non-tribal areas when establishing new NRCs. The number of beds in tribal areas could be increased from the existing 10 bed per NRC. To start with, beds should be increased in NRCs where the BOR is more than/ close to 100%.
- 51. Strengthening of the Follow-up mechanism: Meeting at the sector level and block level should specifically address the subject of status of follow-up of discharged children, with attendance from both DoHFWand DWCD. The MMR/ IMR meeting provides one opportunity as well as the meeting of the District Nutrition Committee. A weight record of the child on each follow-up visits of the child in the line listing should be maintained. The analysis of this data could yield valuable information on the improvement (or otherwise) of the weight-for-length/height (WHZ) status of children once they return to their homes.

1 BACKGROUND

Growth and development is inextricably linked to the nutrition and health status of young children. Undernutrition is well known to result in poor growth and development with adverse physical, cognitive and/or emotional results in the short term. Less well known is that poor childhood nutrition is also associated with several long-term health concerns, with deleterious effects on the collective health of society.¹ Indeed, undernutrition levels among children below five years of age are often taken to be an indication of a society's wellbeing.²

Nutritional status among young children is commonly assessed through three standard physical indices: (i) length/ height for age; (ii) weight for age; and (iii) weight for length/ height. The extent to which the index of each child differs from the 'norm' i.e., the child's z-score can be calculated.³

Box 1 : Stunting, wasting and underweight When a child is significantly shorter than normal for his/ her age, it is termed stunting.

When a child is significantly lower in weight than expected for his/ her age, it is termed underweight.

When the ratio of weight by length/height is significantly below that expected, it is termed wasting.

Global practice is to classify acute childhood undernutrition as follows:

- Moderate Acute Malnutrition (MAM): An individualz-score of WHZ of less than -2SD but greater than -3SD.
- SAM: An individual WHZ of less than -3SD, or a mid-upper arm circumference (MUAC) less than 11.5 cm, or presence of bilateral pitting oedema.^{4,5}

SAM places extraordinary challenges in the way of survival, growth and development of the child under five years of age. Children with SAM are nine times more likely to die than well-nourished children.⁶

¹Bread for the World Institute. (2016). The nourishing effect: Ending hunger, improving health, reducing inequality. Hunger Report. Available at http://hungerreport.org/2016/wp-content/uploads/2015/11/HR2016-Full (Accessed on 29 August 2016).

²Ministry of Health and Family Welfare. (2011). Operational guidelines on facility based management of children with severe acute malnutrition. Available at: http://www.cmamforum.org/Pool/Resources/Operational-guidelines-on-facility-based-management-of-children-with-severe-acute-malnutrition-India-2011.pdf (Accessed on 24 August 2016).

³WHO. (2006). Child Growth Standards. Available at http://www.who.int/childgrowth/standards/en/ (Accessed on 22 August 2016).

⁴WHO. (2016). Identification of severe acute malnutrition in infants under 6 months of age. Available at: http://www.who.int/elena/ titles/sam_identification_infants/en/ (Accessed on 23 August 2016).

⁵In addition to bilateral oedema, other medical complications are also reasons for classifying an under-five as SAM if the WHZ is -3SD.

⁶UNICEF. (2015). Management of severe acute malnutrition: Working towards results at scale. Available at https://www.UNICEF.org/ eapro/UNICEF_program_guidance_on_manangement_of_SAM_2015.pdf(Accessed on 26 August

Globally, 35.0% of the 7.6 million deaths among children under 5 years of age can be attributed to nutrition-related factors and 4.4% to severe wasting, making it clear that prevention and treatment of acute malnutrition is critical to child survival and development.⁷ In 2013, 2.9 million under-five children were admitted globally for treatment of SAM. This figure is almost three times the number of just over 1 million treated in 2009. Yet is clearly insufficient when compared to the global burden of 17 million children estimated to be affected by SAM.⁸ The latest World Health Organization (WHO)-UNICEF-World Bank (2015) joint estimates indicate that globally, the numbers of under-five children with wasting have remained high between 1990 and 2014, with the largest proportions of wasted children living in Asia (68.0%) and Africa (28.0%).⁹

Nutritional status of India and Odisha

With 27 million babies taking birth each year, India has the largest birth cohort in the world.¹⁰ At the same time, each year about 0.5 to 2 million children below five years of age die.¹¹ According to the Rapid Survey of Children (RSOC) conducted in 2013-14, at the national level, 17.3% of children between 0-5 years were severely stunted, 9.5% were severely underweight, and 4.6% were severely wasted. At the state level, the percentages of children below -3SD in all the three nutritional indices - stunting, wasting and underweight - are higher in the Empowered Action Group states including Odisha.^{12,13}

Odisha has a total population of approximately 42 million and an under-five population of approximately 3.7 million.¹⁴ Undernutrition continues to be pervasive even though there have been significant improvements in food production. Not only have various poverty alleviation programmes been implemented to bring overall economic improvement for the poor, but several nutrition related programmes such as the ICDS and the Mid-Day Meal Programme have been operational in the state. Despite these efforts, the National Family Health Survey (NFHS)-4, Clinical, Anthropometric and Biochemical (CAB) study and the RSOC point out that Odisha still has high poverty levels, low female literacy, high rates of malaria and diarrhoea, and poor infant and youth child feeding practices. All these contribute to the poor nutritional status of children in Odisha, including SAM among under-fives.¹⁵

⁷World Health Organization. (2013). Updates on the management of severe acute malnutrition in infants and children. Available at:http://apps.who.int/iris/bitstream/10665/95584/1/9789241506328_eng.pdf (Accessed on 29 August 2016).

⁸UNICEF. (2015). Management of severe acute malnutrition: Working towards results at scale. Available at https://www.UNICEF.org/ eapro/UNICEF_program_guidance_on_management_of_SAM_2015.pdf (Accessed on 26 August 2016)

⁹UNICEF, WHO & World Bank. (2015). Levels and trends in child malnutrition: Key findings of the 2015 edition.

¹⁰Sharma R. (2013). Birth defects in India: Hidden truth, need for urgent attention. Indian Journal of Human Genetics, 19(2). Available at: http://www.ijhg.com/temp/IndianJHumGenet192125-9645566_024045.pdf. (Accessed on 26 August 2016).

¹¹Uauy R, Desjuex, AT, Hossain M et al. (2012). Global efforts to address severe acute malnutrition.Journal of Pediatric Gastroenterology & Nutrition, 55(5), 476-481. Available at: http://journals.lww.com/jpgn/Fulltext/2012/11000/Global_Efforts_to_Address_Severe_Acute.3.aspx. (Accessed on 26 August 2016)

¹²The EAG includes 8 Indian states which receive special focus due to their poor health and nutrition indicators under the National Rural Health Mission of India.

¹³Ministry of Health and Family Welfare, Government of India. (2005-06). National Family Health Survey 3: Volume 1. International Institute for Population Sciences.

¹⁴Data from Census 2011.

¹⁵Bariyar N. (2015). Role of NRCs (Nutrition Rehabilitation Centres) in preventing malnutrition related deaths among under 5 children in Odisha. Available at: http://iphindia.org/role-of-nrcs-nutrition-rehabilitation-centre-in-preventing-malnutrition-related-deathsamong-under-5-children-in-odisha/. (Accessed on 25 August 2016)

Based on the CAB factsheet (2014), 20.2% of children below 5 years in Odisha were wasted (below -2SD) and 6.0% were severely wasted (below -3SD)¹⁶. The RSOC (2013-14) factsheet presents a similar picture. Of children aged 0-5 years, 18.3% were wasted and 4.9% were severely wasted.¹⁷

The most recent NFHS-4 conducted in 2015-16 further corroborates these figures; in Odisha, 20.4% of children between 0-5 years of age are wasted, 6.4% are severely wasted, and 34.4% are underweight. Comparison with NFHS-3 conducted in 2005-06 reveals that even though the proportion of under-five underweight children has reduced in Odisha, the proportion of children who are wasted and severely wasted has risen by 0.8 percentage points and 1.2 percentage points respectively.¹⁸

Global practice in management of SAM

The treatment of SAM occupies a unique position between clinical medicine and public health. SAM is rooted in poverty, poor public health, social exclusion and loss of entitlement, and most cases can be prevented by economic development and public health measures designed to increase dietary quantity and quality alone, with little need for clinical input.¹⁹ Amidst a growing recognition of the extent of SAM in non-emergency situations, there has been a shift in implementation focus and efforts to embed the management of SAM in national health systems and community structures.²⁰

In 1999, WHO established guidelines for management of SAM. According to the guidelines, health workers in the community and PHCs should measure the WHZ, MUAC and oedema of children aged 6 - 59 months. If children or infants have a MUAC<115 mm, a WHZ <-3SD or have bilateral oedema, they should be admitted under a SAM management programme.

Community Based Management is recommended for children without medical complications.²¹ In 2007, the United Nations endorsed CMAM and in 2008, UNICEF issued programme guidance on this approach for children 6–59 months old.²² Community based management involves ensuring that SAM children consume Ready-to-UseTherapeutic Food (RUTF) until they have gained adequate weight.²³

¹⁶Office of Registrar General India. (2014). Odisha Clinical, Anthropometric & Bio-chemical (CAB) factsheet. Available at: http://www. censusindia.gov.in/2011census/hh-series/HH-2/Odisha%20CAB%20Factsheet%202014.pdf.(Accessed on 16 September 2016)

¹⁷Ministry of Women and Child Development. (2014). RSOC National and State Fact Sheets. Available at: http://wcd.nic.in/acts/rapidsurvey-children-rsoc-2013-14. (Accessed on 26 August 2016)

¹⁸Ministry of Health and Family Welfare, Government of India. (2015-16). National Family Health Survey 4. International Institute for Population Sciences.

¹⁹Collins et al. (2006). Management of severe acute malnutrition in children. Lancet, 368, 1992-2000.

²⁰UNICEF. (2015). Management of severe acute malnutrition: Working towards results at scale. Available at https://www.UNICEF.org/ eapro/UNICEF_program_guidance_on_manangement_of_SAM_2015.pdf (Accessed on 26 August 2016)

²¹WHO, WFP, SCN &UNICEF. (2007). A joint statement: Community based management of severe acute malnutrition. Available at http:// www.who.int/nutrition/topics/Statement_community_based_man_sev_acute_mal_eng.pdf (Accessed on 26 August 2016).

²²UNICEF. (2008). Programme guidance: Management of severe acute malnutrition in Children: Programme and supply components of scaling-up an integrated approach. Available at https://intranet.UNICEF.org/PD/Nutrition.

nsf/0/9740CF29DC6FC854852579FA005399AA/\$FILE/Management%20of%20SAM%20in%20Children%202008.doc (Accessed on 26 August 2016)

²³WHO, WFP, SCN &UNICEF. (2007). A joint statement: Community based management of severe acute malnutrition. Available at http:// www.who.int/nutrition/topics/Statement_community_based_man_sev_acute_mal_eng.pdf (Accessed on 26 August 2016).

Facility Based Management is provided to SAM children with medical complications. Global guidance for SAM children with complications is to provide the in-patient child with F75 (75 kcal or 315 kJ/100 mL) or F100 (100 kcal or 420kJ/100 mL) or RUTF as per their requirements.²⁴The child is discharged when following criteria are met: oedema has resolved; child has achieved weight gain of \geq 15% and has satisfactory weight gain for 3 consecutive days (>5 g/kg/day); child is eating an adequate amount of nutritious food that the mother can prepare at home; all Infections and other medical complications have been treated.²⁵ After discharge, the child is followed up in the community to avoid relapse.

Management of SAM in India

Nutritional issues have been the focus of several programmes under a number of Ministries of the Government of India as well as of state governments. Key ministries are the Ministry of Health and Family Welfare (MoHFW) which provides screening, diagnostic, preventive and treatment services and the Ministry of Women and Child Development (MWCD) which is responsible to provide family support services including health and nutrition education, charting of under-fives nutritional status, supplementary feeding, early childhood education and linkages to health services such as immunization and timely medical care.

SAM management is led by the MoHFW under the National Rural Health Mission. Frontline workers of the department i.e., ASHA and ANM work closely with MWCD's AWWs to screen for children with SAM.²⁶ They refer children for further work up and treatment as found necessary using weight for age, MUAC and the presence of bilateral oedema as the screening criteria. Treatment of SAM children takes two forms; facility based for in-patients and community based for out-patients. In India, the in-patient model is the only model that is in wide usage. Only a few states have implemented community-based management of acute malnutrition; these are Bihar, Madhya Pradesh, and Rajasthan.²⁷ In Odisha this is yet to be geared up on a wide scale.

Facility based management takes place in an NRC, a unit in a health facility, where children with SAM are admitted and managed through medical and nutritional therapeutic care. During this period, mothers/caregivers are also provided counselling and support to address the reasons for poor nutrition and health in their child. Operational Guidelines issued by Government of India provide admission and discharge criteria for children with SAM. The Guidelines also specify the quality of care standards that NRCs must maintain. Assurance of quality extends to several aspects of the NRCs' functioning, such as manpower, infrastructure and administration, among other aspects.

²⁴World Health Organization. (2013). Updates on the management of severe acute malnutrition in infants and children. Available at:http://apps.who.int/iris/bitstream/10665/95584/1/9789241506328_eng.pdf (Accessed on 29 August 2016).

²⁵Ministry of Health and Family Welfare. (2011). Operational guidelines on facility based management of children with severe acute malnutrition. Available at: http://www.cmamforum.org/Pool/Resources/Operational-guidelines-on-facility-based-management-of-children-with-severe-acute-malnutrition-India-2011.pdf (Accessed on 24 August 2016).

²⁶Ministry of Health and Family Welfare. (2011). Operational guidelines on facility based management of children with severe acute malnutrition. Available at: http://www.cmamforum.org/Pool/Resources/Operational-guidelines-on-facility-based-management-of-children-with-severe-acute-malnutrition-India-2011.pdf (Accessed on 24 August 2016).

²⁷Source: http://www.ennonline.net/fex/52/acutemalnutritionindiaschildren; &http://www.ennonline.net/fex/43/postscript (Accessed on 3 September 2016)

The SAM programme in Odisha began in 2009 with the establishment of NRCs in Kalahandi and Mayurbhanj districts in 2009.²⁸ From 2009 to 2017, the Government of Odisha has set up a total of 54 NRCs across all districts and 7 more are currently under establishment.²⁹ At the time of data collection, 46 NRCs were actively functioning.

Other important interventions to address undernutrition among under-fives have been undertaken by the state government. The VHND called the Mamata Diwas in Odisha, is one such priority intervention. Observed once every month at the AWC level with the help of ANM, ASHA and AWW, the key objective is to increase access and coverage of basic health and nutrition services for rural communities through service delivery in each village providing multiple services on a fixed day, fixed time and at a fixed place.³⁰ Apart from pregnant and lactating women who are its most direct beneficiaries, VHND also acts as platform for identification of children with SAM.³¹ In the past, a Pushtikar Diwas (a joint initiative of DoHFW and DWCD, Government of Odisha) was held on the 15th of every month at the Block (PHC/CHC) level as a platform to provide clinical screening and treatment services to malnourished children who were referred from the community.³²



Box 2 : Identification and treatment of children with SAM

A recent listing by UNICEF of nutrition specific and nutrition sensitive schemes of the Government of Odisha put the total number at 37. The main departments that were identified were:DoHFW and DWCD. Table 1 presents some of the programmes initiated by the Government of India under various Ministries aimed at specifically tackling undernutrition.

²⁸UNICEF state office for Odisha. (2013). Management of severe acute malnutrition.

²⁹Data shared by UNICEF Odisha on 19 January 2017.

³⁰Presentation on "VHND: Background, new guidelines and technical inputs". Shared by UNICEF in September 2016.

³¹Presentation on "VHND: An outlook". Shared by UNICEF in September 2016.

³²UNICEF state office for Odisha. (2013). Management of severe acute malnutrition.

Department	Schemes		
	Integrated Child Development Scheme (1975)		
	Nutrition Operation Plan (2009)		
	Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (2011)		
	Kishori Shakti Yojana (2006)		
	National Iron Pus Initiative (2013)		
Women and Child Development	'Mamata' Conditional Maternity Benefit Scheme (2010)		
	Indira Gandhi Matritva Sahyog Yojana (2010)		
	Nutrition Programme for Particularly Vulnerable Tribal Groups (2007)		
	Integrated Child Protection Scheme (2009)		
	Village Health and Nutrition Day (2005)		
	Community based Management of Acute Malnutrition (2009)		
	Nutrition Rehabilitation Centres (2006)		
Lealth and Family Malfara	Infant and Young Child Feeding (2007)		
Health and Farmiy Weilare	Bi-Annual Vitamin A and Deworming (2015)		
	National Iodine Deficiency Disorder Control Programme (1988)		
Agriculture	National Food Security Mission (2007)		
	Establishment of Nutri-Farms (2013)		
Education	Mid-Day Meal Programme (1995)		
	Ashram schools (1986)		
SC and ST Welfare	Maa Baadi Yojana (2007)		

Source: Official website and Annual Reports (various years) of the respective departments.

Role of NRC

The Operational Guidelines of the Government of Odisha, which are based on the national Guidelines and the WHO protocols, list four main objectives of the NRCs:

- To provide clinical management & reduce mortality among children with SAM, particularly among those with medical complications.
- To promote growth of children with SAM both physical & psychological.
- To build the capacity of mothers & other caregivers in appropriate feeding & caring practices for infants & young children.
- To identify the social factors that led to SAM of the child.³³

The Guidelines also provide additional information about the functioning of NRCs. When a child is referred to the NRC, the first step is to see if the child is indeed, eligible to be admitted. Because frontline workers use the weight for age criteria rather than weight for length, there is need for re-evaluation of the young child. Once admitted, SAM management in NRCs takes place in three phases: Stabilization Phase, Transition Phase and Rehabilitative Phase.³⁴

³⁴World Health Organization. (2013). Updates on the management of severe acute malnutrition in infants and children. Available at http://apps.who.int/iris/bitstream/10665/95584/1/9789241506328_eng.pdf (Accessed on 27 August 2016)

³³Department of Health and Family Welfare. Government of Odisha. (2014-15). State operational guidelines on facility based management of severe acute malnutrition.

The first phase usually lasts for 1-2 days, and the primary purpose is to stabilize the health of the child using a Starter diet (F75) which promotes recovery of normal metabolic function and nutrition-electrolytic balance. A child moves to the second phase when there is some loss of oedema, return of appetite, no severe medical problem and when s/he is alert and active. Diet during this phase is most commonly, the F100 formula. In the third phase, the aim is to promote rapid weight gain, stimulate emotional and physical development and prepare the child for normal feeding at home. The child's family is made aware of appropriate feeding practices at home to ensure continued care of the child. Once the child has achieved the target weight, s/he is ready to be discharged.

The Guidelines are specific about infrastructural, equipment, supplies and staffing requirements of the NRCs and provide comprehensive guidance on how the NRC is to be run. For example, a 10-bedded NRC should have a covered area of about 1950 sq. ft. This should include facilities like patient area, play and counselling area, nursing area and separate kitchen and bathroom. Additionally, NRCs are required to maintain and update in a timely manner, their records and monthly reports, as well as monitor food preparation, ward procedures and hygiene. Monitoring of each NRC's performance is based on outcome indicators such as admissions, bed occupancy rate, weight gain during stay at NRC, death rate and defaulter rate among others, for each of which expected levels are determined.

The Guidelines further make a point of monitoring the discharged child's progress with the help of the ASHA worker at the village level. This is an extremely vital aspect of the treatment process, since there is still a possibility of relapse while at home. Towards this purpose, scheduled visits to the NRC for follow-ups have been recognized as essential to ensure that the discharged child reaches -1SD.³⁵

However, barriers to utilization of NRCs - both from the demand and supply side - pose concerns for the effectiveness of facility based management. High opportunity costs for agricultural workers in the form of wage loss incurred while at the NRC may act as a deterrent in coming to the NRC for treatment, or completing treatment for the full length of time.^{36,37} Studies have also shown that a high default rate is associated with the quantum of household duties a caregiver is faced with, as well the number of siblings in the family which could reduce allocation of time and financial resources towards the child with SAM.³⁸ Lack of awareness among parents about the importance of nutrition leads parents not to take undernutrition seriously, and some families might prefer alternatives to institutionalized treatment such as faith healing.³⁹

³⁵Department of Health and Family Welfare. Government of Odisha. (2014-15). State operational guidelines on facility based management of severe acute malnutrition.

³⁶Mathur A, Tahilramani G, Yadav D, Devgan V. (2016). Experience in managing children with severe acute malnutrition in nutrition rehabilitation centre of tertiary level facility, Delhi, India. International Journal of Contemporary Paediatrics, 3(2), 597-600. Available at: http://dx.doi.org/10.18203/2349-3291.ijcp20161046(Accessed on 31 August 2016).

³⁷Bariyar N. (2015). Role of NRCs (Nutrition Rehabilitation Centres) in preventing malnutrition related deaths among under 5 children in Odisha. Available at: http://iphindia.org/role-of-nrcs-nutrition-rehabilitation-centre-in-preventing-malnutrition-related-deathsamong-under-5-children-in-odisha/ (Accessed on 27 August 2016)

³⁸Sanghvi, J., Mehta, S. & Kumar, R. (2014). Predicators for Weight Gain in Children Treated for Severe Acute Malnutrition: A Prospective Study at Nutritional Rehabilitation Center. ISRN Paediatrics, Volume 2014.

³⁹Rogers E,Myatt M, Woodhead S, Guerrero S, and Alvarez JL. (2015). Coverage of community-based management of severe acute malnutrition programmes in twenty-one countries, 2012-2013. PLoS One, 10(6). Available at http://www.ncbi.nlm.nih.gov/pmc/articles/ PMC4456359/

Demand-side factors also play a role in determining the ability and willingness of parents to undertake follow up visits to the NRC. Transportation costs to and from the NRC act as a major barrier for families to undertake follow up visits required.⁴⁰

On the supply-side, lack of effective collaboration between frontline workers and by them with the NRC may lead to poor uptake of services. This may be due to factors such as inadequate compensation or incentives to the frontline worker, or lack of awareness about the proper protocols for identification of SAM children.⁴¹ International studies have also confirmed the role of properly trained staff at the NRC in ensuring that it functions effectively.^{42,43}

Support Role of UNICEF for SAM Management in India

UNICEF has been engaged with the prevention and treatment of acute malnutrition through five approaches; these are (i) supply and delivery, (ii) capacity building, (iii) leadership and technical guidance, (iv) norms and standard setting and (v) advocacy.⁴⁴ In a global context, it is involved in the strengthening of supply and delivery of RUTF to remote areas and in emergency contexts. It has supported national governments in 75 countries with change to policy and programmes, and provided technical guidance and training packages for health workers. It also supports to update the treatment approaches, protocols and provide advocacy at global and national level.

UNICEF began its work in India in 1949 with a multi-pronged approach to address various health issues, such as polio, maternal mortality and maternal and child nutrition.⁴⁵ SAM management is an important aspect of UNICEF's involvement with the MoHFW. UNICEF is collaborating with the Government of Odisha to establish and strengthen facility- based care and support for children with SAM by supporting NRC in the state. Tasks undertaken have included (i) support to district administration in establishing and operationalizing NRCs and (ii) capacity building efforts. UNICEF has undertaken advocacy with state and district level officials to facilitate the process of establishing and operationalizing the NRCs. Odisha state specific guidelines were developed for NRCs and training was provided to the NRC staff and supervisory and frontline workers. To maintain the data quality of monthly and quarterly reports, standardized reporting formats for NRCs were developed by the state where the technical support from UNICEF was obtained.⁴⁶ Support by UNICEF, it is hoped, will help the state government to undertake effective management of SAM children.

⁴⁰Bariyar N. (2015). Role of NRCs (Nutrition Rehabilitation Centres) in preventing malnutrition related deaths among under 5 children in Odisha. Available at: http://iphindia.org/role-of-nrcs-nutrition-rehabilitation-centre-in-preventing-malnutrition-related-deathsamong-under-5-children-in-odisha/ (Accessed on 27 August 2016)

⁴¹UNICEF state office for Odisha. (2013). Management of severe acute malnutrition.

⁴²Collins, S. (2006). Treating severe acute malnutrition seriously. Archives of Disease in Childhood, 92, 453-461.

⁴³Collins et al. (2006). Management of severe acute malnutrition in children. Lancet, 368, 1992-2000.

⁴⁴UNICEF. (2015). Severe acute malnutrition. Available at: http://www.UNICEF.org/nutrition/index_sam.html. (Accessed on 27 August 2016)

⁴⁵UNICEF. (2015). Our History. Available at: http://UNICEF.in/WhoWeAre/History. (Accessed on 27 August 2016)

⁴⁶UNICEF state office for Odisha. (2013). Management of severe acute malnutrition.

2 METHODOLOGY

UNICEF is supporting the DoHFW, Government of Odisha with a documentation of NRC-based management of SAM in the state. It identified Amaltas, a Delhi based research and consulting organization to carry out the study. The documentation covers the 46 NRCs of the state that were functioning at the time of data collection in September 2016.⁴⁷

The main objectives of this assignment were to:

- Assess the status of functioning of facility based management of children with SAM in Odisha.
- Identify bottlenecks and good practices in facility based management of SAM.
- Propose recommendations for addressing bottlenecks and strengthen the programme.

The broad areas of documentation included:

- Infrastructure, staff availability, staff skills and accessibility of NRCs.
- QoC at NRCs relative to state operational guidelines.
- Time trends in NRC outputs such as recovery rate, defaulter rate and case fatality rate.
- Time trends of process indicators such as weight gain, length of stay, bed occupancy, referral rate and follow up rate.

The findings of the documentation exercise will help the Government of Odisha to ascertain the difficulties and challenges of implementing facility based management of SAM and take decisions about its improvement.

Approach & Methodology

A mixed methods approach was adopted for the assignment. Analysis is based on both quantitative and qualitative data: quantitative data looks primarily at the status of NRC functioning, while the qualitative data explores demand and supply side issues that might make functioning less than optimal. Information has been collected from both the primary and secondary sources.

Secondary data sources included:

- APR of 45 NRCs for the year of FY2014-15 and FY2015-16
- MPR of 10 NRCs for the year of FY2014-15 and FY2015-16
- Programme documents
- Articles from journals and results from historical surveys

A mix of quantitative and qualitative methods were used to collect the primary data. These were:

- QoC checklist of 46 NRCs collected for the study by UNICEF consultants
- 10 Question Assessment Tool with the current users (10QAT-CU) of 46 NRCs
- 10 Question Assessment Tool with the follow-up users (10QAT-FU) of 6 selected NRCs
- IDIs with the NRC staff and follow-up users at 6 selected NRCs
- FGD with the frontline workers and with current users at 6 selected NRCs
- IDIs with the state and district level DoHFW and DWCD officials and the staff of UNICEF
- Case studies of two best practices

Six NRCs were identified on the basis of NRC outcome data in the April 2015 - March 2016 annual report received from UNICEF Odisha.⁴⁸ After distribution of the NRCs into the northern, central and southern regions, two NRCs per region - one well performing NRC and one poorly performing NRC- were identified. On the advice of the UNICEF RDC consultant, DHH Boudh, a poorly performing NRC was replaced with SDH GUNUPUR, another poor performing NRC from the same division. The identified NRCs are presented in Table 2.

Pagion	District and name of facility where NRC is located		
negion	Good performing NRC	Poor performing NRC	
North	Keonjhar (DHH KEONJHAR)	Sambalpur (VSS MC Burla)	
Central	Mayurbhanj (DHH MAYURBHANJ)	Balasore (SDH NILAGIRI)	
South	Koraput (CHC Rabanaguda)	Rayagada (SDH GUNUPUR)	

Table 2 : List of sampled NRCs*

* Tribal districts denoted by use of caps

In each of the identified NRCs, IDIs were conducted with NRC staff, i.e. the MO, NC, ANM and Cook-cum-attendant. In addition, IDIs were conducted with 2 parents/caregivers who had come for follow-up visits. FGDs were conducted with the parents/caregivers of current users of NRC and with frontline workers such as ANMs, AWWs and ASHAs. For operational feasibility the FGDs were conducted at the district headquarter. The frontline workers were mobilised from the blocks covered by the respective NRC with the help of UNICEF RDC consultants.

To capture the state level picture on the functioning of NRCs IDIs were conducted with relevant state level officials such as Principal Secretary, DoHFW, Government of Odisha; Director,DoHFW, Odisha; Director, DWCD, Odisha; Deputy Director, Nutrition; Nutrition Officer, DoHFW, Odisha; and State Data Manager, DoHFW, Odisha. At the district level,IDIs were undertaken with the Chief District Medical Officer, District Social Welfare Officer, Child Development Project Officer, District Programme Manager & District Data Manager- National Health Mission (NHM). Finally, IDIs with the staff of UNICEF were carried out.

In order to document the learnings on the functioning of NRCs, best practices were identified in consultation with UNICEF RDC consultants. Twocase studies of best practices have been prepared and are presented in the Findings chapter.

⁴⁸As per the information provided by UNICEF Odisha

Development of Tools

Desk review of programmatic documents provided by UNICEF was carried out prior to the development of tools.Development of an Information Needs Matrix preceded the development of the tools.

Separate IDI and FGD guides were developed. In addition, Amaltas prepared the 10QAT to understand the proximal and distal factors that affect treatment seeking from NRCs by mothers/ caregivers of SAM children at the NRC as well as those returning for follow up visits. The tool comprised of 10 simple structured questions, so as to allow easy administration with current and follow-up users. For collection of data on QoC, a checklist was prepared by Amaltas in consultation with UNICEF Odisha.

The tools were shared with UNICEF Odisha for review. Feedback on the study design and tools was also received from Dr. Praveen Kumar of Kalawati Saran Children's Hospital, as an Independent Reviewer.

Data collection, entry and validation

Amaltas prepared a detailed field plan to undertake the primary data collection in the selected 6 NRCs and IDIs with state level officials and UNICEF staff. The plan was discussed with the 3 UNICEF RDC consultants before finalisation.

SI. No.	Data collection	NRC location	District	Team
1	15 – 17 September	DHH KEONJHAR	Keonjhar	Team 1
2	15 – 17 September	SDH NILAGIRI	Balasore	Team 2
Sunday				
4	19 – 21 September	VSS MC Burla	Sambalpur	Team 1
5	19 – 21 September	DHH MAYURBHANJ	Mayurbhanj	Team 2
6	22 – 24 September	SDH GUNUPUR	Rayagada	Team 1
Sunday				
8	27 – 29 September	CHC Rabanaguda	Koraput	Team 1

Table 3 : Detailed Field Plan of data collection in NRCs

Two teams comprising one evaluation specialist and one researcher were constituted to undertake primary data collection. The data collection in 6 NRC took place from 15 to 29 September 2016. The IDIs and FGDs were recorded so that the detailed information could be referred to in case of requirement. Data collection was supervised by UNICEF RDC Consultants. Qualitative information obtained from the IDIs and FGDs were entered in a matrix on the basis of key sub-themes listed in the tools. The Amaltas team also administered the 10QAT-FU in sampled NRCs. In one NRC, no follow-up users were found on the days of visit. Data of the 10QAT-FU from 5 NRCs was also entered into Excel.

The QoC checklist and 10QAT-CU were administered by the 3 UNICEF RDC consultants in all NRCs in October and November 2016. Data of QoC checklists from the 46 NRCs were entered in Excel. The entered data was carefully reviewed for quality control. Identified queries were suitably addressed with the help of UNICEF RDC consultants.Data entry of 10QAT-CU from 44 NRCs were done in Excel.

APR data for years FY2014-15 and FY2015-16 was received from State Maternal and Child Survival Cell (Office of DoHFW) and cleaned and readied for analysis. Queries were addressed by the officials of UNICEF and State Data Manager (State Maternal and Child Survival Cell, Office of DoHFW, Odisha).

The month-wise database of MPRs of 10 NRCs for FY2014-15 and FY2015-16 was received from UNICEF and were consolidated to create a year-wise database. Entries required alignment and all double-entries were eliminated carefully. Queries were addressed with the help of UNICEF SAM consultant and State Data Manager (NHM Data cell).

The entered databases were thoroughly reviewed for quality control before analysis.

Data Analysis

Quantitative analysis of the two years APR data and MPR database of 10 NRCs was carried out for indicators of interest. The MPR data included 3124 children admitted in 10 NRCs between April 2014 to March 2016. Indicators include: admissions at NRC, transfer to another health facility, BOR, discharged from NRC, average LoS, discharged recovered and unrecovered, defaulter rate, and deaths. Advanced analysis of the data sets was done to present the findings by district, and by NRCs in ITDA areas/ non-ITDA areas as required.

Frequency analysis of 10QAT data was done on the indicators of interest and suitable detailed analysis carried out.In total, 10QAT data of 313 current users and 11 follow up users was analysed. Analysis of the FGDs and IDIs were carried out using recursive abstraction to delineate findings on status of functioning of the NRCs, demand and supply side factors impeding the fullest use of the NRCs, what works well and what doesn't seem to work well, and key learnings.

The data on the QoC checklist for 46 NRS were analysed to understand key aspects of the functioning of NRCs viz., availability of trained manpower, availability and functional status of measuring instruments, kitchen equipment, availability of essential charts, medicines, and records. Indices were developed for resources at the NRCs namely manpower, measuring instruments, kitchen equipment, essential charts, medicines, and records. Five indices of QoC were developed to capture the effectiveness, efficiency, equity, patient-centeredness, and safety at each NRC. All indices run from 0 to 10.

3 FINDINGS

NRCs are the specialized units at which facility based care is provided to children with SAM. Protocols published by the MoHFW, Government of India are based on WHO guidance. Operational guidelines on Facility Based Management of children with SAM were issued in 2011. Odisha has prepared its Operational Guidelines which derive, with some modification, from the national guidelines.

Detection of children with SAM is carried out by the frontline workers (ANM, AWW, ASHA) through platforms such as the monthly VHND and PushtikarDiwasor during routine growth monitoring carried out by AWWs. During the VHND, measurement of MUAC is taken and presence of bilateral pitting oedema is assessed in addition to recording of weight for age. All children with bilateral pitting oedema and/or MUAC \leq 115mm are referred to the NRC for admission. SAM cases may be identified by Paediatric MOs of a hospital. In addition, the parents/ caregivers of the children with SAM can directly come to the NRC for admission (self-referral).

NRCs located in ITDA areas are denoted in the text, graphs and maps in capital letters, while those in non-ITDA areas in small case.

Status of performance indicators

Admissions

Upon presentation, the age, weight, height/length, MUAC and presence/absence of bilateral pitting oedema of all children who have been referred, are re-assessed by NRC staff. Cases are admitted for inpatient treatment subject to the criteria of admission mentioned in the state's Operational Guidelines.

Admission criteria for children 6-59 months

- MUAC ≤ 115mm (11.5 cm) with or without any grade of oedema
- WHZ ≤ -3 SD with or without any grade of oedema
- Bilateral pitting oedema +/++ (children with oedema +++ always need inpatient care)

Admission criteria for infants <6 months

- Infant is too weak or feeble to suckle effectively (independent of his/her weight-for-length)
- WHZ≤ -3SD (in infants >45cm)
- Visible severe wasting in infants <45cm
- Presence of oedema both feet

As per the APR, between 1 April 2014 and 31 March 2015, 5953 SAM children were admitted to 43 NRCs that were in place by that time, while a total of 6765 SAM children were admitted to 45 NRCs in FY2015-16. There has been an increase of 800 admissions of SAM children between the two years. Of the total 12,718 SAM children admitted in the two years, 53.4% were girls while 46.6% were boys. Analysis by age group showed that 11.7% were in the age group of 0-5 months, 62.1% were in the age group of 6-23 months, and 26.2% in the age group of 24-59 months. The analysis by social groups found that 21.1% of the admitted children were from scheduled castes, 55.7% children were from scheduled tribes, and 23.1% were from other social groups.

On average, there were 6359 SAM admissions in the state per year. As per NFHS-4, there are an estimated 2,71,000 SAM children in Odisha.⁴⁹ Applying a correction factor of 2.6 to the point prevalence of 2,71,000 cases and with a 50% expected coverage as per international standards, the number of children that need to be reached (estimated annual case load of SAM among 6 month - 5 years) is 3,16,000. Thus the average number of admissions per year accounts for 2.0% of the estimated annual case load of SAM. These figures signify important programme inferences for the state if it wishes to make a serious dent in addressing all SAM children. Two solutions present themselves; either it will have to either expand its network of NRCs by a considerable factor or opt for a CMAM approach to cater to uncomplicated cases of SAM, reserving NRCs for complicated cases.

During the two year period, the top three NRCs in terms of highest number of admissions were CHC Umerkote (612), DHH KORAPUT (586), and DHH NAWARANGPUR (528). The latter two NRCs are located in ITDA areas. During the same time period the bottom three NRCs in terms of lowest number of admissions were CHC Khaprakhole (139), SDH GUNUPUR (142), and VSS MCBurla (166). While SDH GUNUPUR is located in an ITDA area, the other two NRCs are in non-ITDA area. The top three districts in terms of number of admissions were Nawarangpur (1140), Koraput (1034), and Mayurbhanj (889). The bottom three districts by number of SAM children admitted were Balasore (178), Cuttack (187), and Jajpur (204).



Graph 1 : Admissions by district in FY2014-15 and FY2015-16

In order to undertake further analysis, MPR data for the 24 months (April 2014 - March 2016) was analysed. Bilateral oedema was recorded in 2.0% of admitted children during the period. The rate of oedema rate at VSS MC Burla was 12.2% and at DHH KEONJHAR was 6.6%. In the same period, no cases of oedema were recorded at SDH GUNUPUR, CHC Rabanaguda, and CHC Ullunda. The reasons for this would require a more detailed study of the causes.

⁴⁹Ministry of Health and Family Welfare, Government of India. (2015-16). National Family Health Survey 4. International Institute for Population Sciences.

Analysis of MPR data suggested that there was a seasonal variation in admissions to NRCs. Of the 3124 SAM children admitted, the highest number of admissions took place in May (317) and June (318), considered the lean season for agricultural work. The lowest number of admissions took place in November (221), December (226) and January (231). In Odisha, these months are the paddy-harvesting season. This triangulates with findings from FGDs with mothers, which revealed that in the paddy-harvesting season, mothers are reluctant to commit 2 -3 weeks of their time to the child with SAM, as it would mean a loss of daily income.

Analysis of MPR data of admitted cases was carried out by the area of origin, pointing to some interesting features. Of the 3118 admitted children for which this information is available, 32.8% SAM cases originated from the same block in which the NRC is located, 45.9% came from the neighbouring blocks, 17.5% were from other blocks, and 3.8% were from other districts. Further analysis of the data was carried out to distinguish between ITDA and non-ITDA area. In ITDA areas, of the 1373 children admitted in NRCs, 23.6% of cases came from the same block, 40.7% from neighbouring blocks, and 35.0% from other blocks. For the NRCs located in non-ITDA areas of the 1745 children admitted, 40.1% came from the same block, 49.9% from neighbouring blocks, and 3.8% came from other blocks. This kind of information would be useful when considering where to establish new NRCs in the future.





MPR data on SAM cases was analysed for the proportion of cases with a WHZ \leq -4SD providing an idea of the degree of severity of cases. Of the total 3124 SAM children admitted, 41% children were \leq -4SD. NRC wise findings revealed a very high proportion of -4SD cases in DHH MAYURBHANJ (97%), which could reflect the magnitude of the acute malnutritionor the alertness of the frontline workers who could refer these cases to the NRC. The lowest proportion of \leq -4SD cases were found in DHH GUNUPUR (9%) and CHC Rabanaguda (12%).

MPR data analysis found that 46.6% cases were referred by frontline workers (AWW, ANM, ASHA), 24.6% by MO (any OPD), 14.9% by others, and 7.9% cases from PushtikarDiwas. In 6.0% cases information on the source of referral was not available.

Bed Occupancy Rate

As per the state's Operational Guidelines, each NRC should have 10 beds. BOR for an NRC is the [Total number of inpatient days for a given period / Available beds x Number of days in that period] x100. BOR is an important performance indicator of the NRC as it reflects the extent to which available bed capacity is utilised. From the reports, it was found that 2 NRCs in the state, viz. SDH GUNUPUR (5), and CHC Saintala (7) had fewer than 10 beds.

According to APR data, the average BOR for the state has increased from 56.6% in 2014-15 to 61.4% in 2015-16. There are 3 NRCs each in 2014-15 and 2015-16 which have a BOR more than 100%. These NRCs are DHH MAYURBHANJ, DHH NAWARANGPUR, and CHC Umerkote in FY2014-15 and DHH KORAPUT, CHC Rabanaguda, and CHC Umerkote in FY2015-16. This may reflect a higher case load in the area or better field-facility coordination.

There are 15 NRCs where, consistently over the 2 years, BOR is more than state average; these are SDH Bhanjanagar, SDH BONEIGARH, SDH CHAMPUA, DHH GAJAPATI, DHH KALAHANDI, DHH KANDHAMAL, DHH KEONJHAR, DHH KORAPUT, DHH MAYURBHANJ, DHH NAWARANGPUR, CHC Rabanaguda, SDH RAIRANGPUR, DHH Sambalpur, DHH SUNDERGARH, and CHC Umerkote. In 23 NRCs, the BOR has consistently been less than the state average over the 2 years. Analysis of APR data by ITDA and non-ITDA area provided further insights. Of the 18 NRCs located in ITDA areas, 11 NRCs have performed consistently better than the state average over the 2 years. Of the 25 NRCs in non-ITDA area, only 4 NRCs had BOR better than the state average average over the 2 years.

Out of 43 NRCs, the BOR of 9 NRCs has increased by more than 20% between the two years. These are SDH BALIGUDA, DHH DEOGARH, SDH Kamakshyanagar, SDH KARANJIA, CHC Khandapada, SDH Padampur, CHC Rabanaguda, DHH RAYAGADA and Shishu Bhawan Cuttack. The 3 NRCs where the BOR has fallen by more than 20% between the two years are DHH MAYURBHANJ, DHH NAWARANGPUR and DHH Nuapada.





Status on exit indicators

After the admission of SAM children at the NRC, the MO or ANM reviews the case for the presence/absence of medical complications and poor appetite. Children with medical complications, and /or bilateral pitting oedema, and/or poor appetite are fed a starter diet (F-75) every two hours for two days by the ANM. After completion of the initial two days, these children are fed a catch-up diet (F-100) six times daily for two days to initiate rapid weight gain. Children with normal appetite and free of medical complications and bilateral pitting oedema are given F-100 from the day of the admission. After four days at the NRC, children are fed F-100 alternately with a locally prepared semi-solid therapeutic food until the child is discharged from the NRC.

The national and international standards of care mention about the acceptable level of care on performance indicators such as length of stay, recovery rate, death rate, defaulter rate and weight gain (g/kg body weight/day).^{50,51} In the discussion that follows the acceptable level of care for the relevant indicatorhas been referred to.

Transfers

In all, the APR shows that 12,718 SAM children were admitted between 1 April 2014 and 31 March 2016. Of these cases, 8.1% cases (1030) cases were transferred to another health facility for medical reasons. NRCs located at different types of health facilities had different transfer rates. 6.6% (193) cases were transferred from those at CHCs, 7.0% (214) from those at SDHs, 8.8% (559) from those at DHHs, and 18.1% (64) from those at Tertiary Hospitals.

Discharge & Average Length of Stay



The average LOS is the sum of the number of days in the NRC of all discharged children divided by the number of all discharged children. As per APR data, the average LOS was 15 days each for FY2014-15 and FY2015-16. The average LOS for each NRC in FY2014-15 and FY2015-16 was less than 4 weeks, which is within the acceptable limit as per the national and international standard of care.



Graph 4 : Transfers from NRCs (2014-16)

⁵⁰The Sphere Project, Humanitarian charter and minimum standards in humanitarian response, 3rd ed. Northampton: Belmont Press Ltd, 2011.

⁵¹Ministry of Health and Family Welfare. (2011). Operational guidelines on facility based management of children with severe acute malnutrition. Available at: http://www.cmamforum.org/Pool/Resources/Operational-guidelines-on-facility-based-management-of-children-with-severe-acute-malnutrition-India-2011.pdf (Accessed on 24 August 2016).
For FY2015-16, 13 out of 45 NRCs had an average LOS above the state average. These NRCs are: DHH Balangir, SDH BALIGUDA, SDH Bhanjanagar, VSS MC Burla, SDH Hindol, DHH KEONJHAR, DHH MAYURBHANJ, DHH NAWARANGPUR, SDH RAIRANGPUR, CHC Sakhigopal, DHH Sambalpur, and DHH SUNDERGARH. NRCs in which the average LOS was consistently above state average over the 2 years are: SDH Bhanjanagar, VSS MCBurla, SDH CHAMPUA, SDH Hindol, DHH KALAHANDI, DHH KEONJHAR, DHH MAYURBHANJ, SDH RAIRANGPUR, CHC Sakhigopal, DHH Sambalpur, and DHH SUNDERGARH. For both years combined, the highest average LOS (21 days) was found in SDH RAIRANGPUR while the average LOS was lowest at DHH Boudh (10 days).

Analysis of APR data by NRCs located in ITDA and non-ITDA area yielded meaningful information. In FY2014-15, the average LOS for NRCs in ITDA areas was 15.3 days and for the NRCs in non-ITDA areas was 13.7 days. In FY2015-16, the average LOS for the NRCs in ITDA area was 14.8 days and for the NRCs in non-ITDA areas was 14.1 days. NRCs located in ITDA areas had an average LOS that was marginally higher than the average for NRCs located in non-ITDA areas each year.

Discharged Recovered and Unrecovered

According to the state's Operational Guidelines, an important discharge criteria is \geq 15% weight gain over the weight recorded at the time of admission of the child. Discharged recovered (Recovery rate) is the proportion of children discharged with \geq 15% weight gain within the reporting period divided by the total exits. Discharged unrecovered is the proportion of children discharged with <15% weight gain within the reporting period divided by the total exits.

As per APR data,80.7% (9433) of the total number of exits (11688) were discharged recovered during the two year period. Year wise analysis of the APR data showed that recovery rate rose from 79.3% in FY2014-15 to 81.9% in FY2015-16. For two years combined, the top three NRCs by recovery rate were SDH NILAGIRI (97.1%), CHC Rabanaguda (94.1%) and DHH KALAHANDI (94.0%). During the same time period, the bottom three NRCs by recovery rate were DHH Boudh (36.2%), CHC Khaprakhole (36.9%), and SDH Padampur (61.4%).

As per the national and international standards of care, a recovery rate of \geq 75% is acceptable. During the two year period, 29 of 45 NRCs





reached the acceptable recovery rate of \geq 75% and the remaining 16 NRCs were not able to reach the acceptable recovery rate. Additional analysis revealed that of the 18 NRCs located in ITDA areas, 14 were able to achieve the acceptable recovery rate of \geq 75%. Of the 27 NRCs in non-ITDA areas, 15 NRCs reached the acceptable recovery rate. The analysis of data by districts pointed out that 21 of the 29 districts had an average recovery rate \geq 75%.

APR data of two years showed that 7.4% (870) of the total number of exits (11,688) were discharged unrecovered from NRCs. This was the same in both years. Analysis for two years combined showed that the highest percentage discharged unrecovered cases were from SDH Kamakshyanagar (27.8%), SDH Padampur (24.1%), and DHH RAYAGADA (24.1%).

Analysis of data by location of NRCs for two years combined revealed that out of total exits 5.7% children were discharged unrecovered from NRCs located in ITDA areas while 9.2% were discharged unrecovered from NRCs in non-ITDA areas.

Analysis of data from the MPR provided information on the average weight gain per day (g/kg body weight) according to the age of the admitted child. The rate of weight gain of children aged 0-12 months was higher, albeit declining. After age 12 months, the rate of weight gain was lower and flat. *Graph 6 : Average weight gain per day*

Average weight gain per day (g/kg body weight) in NRCs of ITDA areas was 8.2 and of non-ITDA areas was 10.7. The MPR data was analysed to see the average weight gain among the children discharged recovered and discharged unrecovered. The result showed that the average weight gain per day (g/kg body weight) was 11.2 for discharged recovered and 9.1 among discharged unrecovered.

20 18 16 day (g/3g) 14 12 pain / 10 weight N. 10 20 30 60 Age of child (reonths) Source- SADE

by age of the child (2014-16)

Defaulters

A child admitted to the NRC is considered as a defaulter when s/he had not attended the NRC for 3 consecutive days. Defaulter rate is the proportion of admitted children that defaulted during the reporting period divided by the total exits.

Of the total number of exits (11,688) during the FY2014-15 and FY2015-16, 11.7% (1368) had been

listed as defaulters from the NRCs. The default rate has fallen from 13.0% (706 out of 5413 cases) in FY2014-15 to 10.5% (662 out of 6275 cases) in FY2015-16.

According to the national and international standards of acceptable level of care, a defaulter rate of \leq 15% is acceptable. APR data for the two years combined showed that 31 out of 45 NRCs had a defaulter rate below the acceptable level. APR data for FY2014-15 finds that 27 out of 43 NRCs had a defaulter rate \leq 15%, while in FY2015-16,32 out of 45 NRCs had a defaulter rate below the acceptable level. Additional analysis revealed that the defaulter rate was 10.4% in NRCs located in ITDA area and 12.0% in NRCs from non-ITDA area.

Graph 7 : Default rate in ITDA and non-ITDA areas (2014-16)



Deaths

According to the national and international standards of care, a death rate of <5% is acceptable. The death rate in FY2014-15 and FY2015-16 combined was 0.1%.

In absolute number during the two year period, 17 deaths were reported. During the two year period the highest number of deaths in 2014-15 were reported in DHH Balangir (3).

Barriers and facilitators

Identification

The primary data collected from mothers of admitted SAM children in all the NRCs; IDIs and FGDs with NRC staff, mothers and frontline workers from the 6 NRCs and interviews with district and state level officials provided useful information on barriers and facilitators with regard to key aspects of the NRCs.

Detection of children with SAM at the community is the first important step to the facility based management of SAM. It has already been mentioned in this chapter that the detection or identification of children with SAM is carried out through platforms such as monthly VHND, and monthly Pushtikar Diwas. The practice of identification and referral of SAM children at monthly Pushtikar Diwas in the Block PHC and CHC has ceased. Under Odisha government's new intervention for accelerated reduction of Maternal and Infant Mortality several initiatives have been started that focus on the SAM children. These are strengthening of VHNDs in hard to reach areas by providing mobility support for holding of monthly VHND; strengthening community level care of children up to 1 year by offering advice for institutional follow ups for cases discharged from NRC; and provision for performance based incentive to ASHA for survival of high-risk children (definition includes SAM children) up to 18 months (Rs 1000/ per case).⁵²

Identification of SAM cases is being done through the RBSK team as well. The RBSK team visits the AWC in a particular day as per the micro plan. During the visit weight and height measurements of children is taken of children who are low weight for age. Children with a WHZ of less than -3SD are brought to the NRC on the same day for admission in the RBSK vehicle.

Yet qualitative interviews with District-State officials and at the NRC suggest that although each day is supposed to be a Pushtikar Diwas, hardly any one visits the health facility for identification.⁵³This is particularly low for families residing in distant places. Households in which women go out of the home for work do not attend the VHND. Screening of children (0-5 years) from these households remained a challenge.⁵⁴ IDIs with NRC staff revealed that sometimes MUAC measurement by frontline workers is not accurate and when these cases present at the NRC, they are rejected.

Frontline workers play an important role to conduct the VHND and identification of SAM cases during the VHND. However, ASHAs are not very keen to mobilize the families having children below five years for VHND due to other pressing priorities. They are less interested to cover the families located remotely from the AWC.⁵⁵

RBSK teams have an infantometer and stadiometer. They are thus able to calculate the WHZ score accurately. Hence cases identified by them are seldom rejected for admission at the NRC. Mothers also find the RBSK vehicle very convenient to reach the NRC for admission.⁵⁶ In addition to the role of frontline workers in identifying SAM children at AWC, RBSK teams could provide additional support for the identification and referral of SAM children.⁵⁷

⁵²Odisha State strategy for accelerated reduction of Maternal and Infant Mortality, Department of Health and Family Welfare, Government of Odisha.
 ⁵³District-State Officials IDI, NRC IDI&FGD
 ⁵⁴NRC IDI&FGD
 ⁵⁵FLW FGD
 ⁵⁶NRC IDI&FGD

57District-State Officials IDI, NRC IDI&FGD

Box 3: Best practice: CHC Rabanaguda

CHC Rabanaguda has developed a reputation for good practice. This is reflected in the generally high outcomes of the NRC: it has near perfect scores on the Resources Indices, as well as very good scores on the Quality of Care Indices. There is regular monitoring of progress of each child, counselling of mothers, and careful application of discharge criteria.

Monitoring and counselling Rebati's* mother watched as the ANM sister took her daughter's weight that morning. She had become used to the routine. First the weight, then calculating the weight gain and recording any fresh symptoms/signs. Records were maintained of Rebati's 24hour dietary intake each day and length and MUAC recorded each week.

Rebati's mother appreciated the counselling sessions which focussed on health and nutrition. She had not realised what an important role she was playing in her daughter's well-being. She had learnt the importance of immunization, breastfeeding



and healthy weaning practices, maintenance of hygiene and prevention of infections, use of oral rehydration therapy, family planning, female literacy etc. Most importantly, the counsellor and ANM had told her about locally available nutritious food and given hands on training on the preparation of home based foods she could give Rebati at home after discharge from the NRC. She really appreciated that.

The day had come. Rebati was going to be discharged today. The doctor checked that she had been in the NRC for a minimum 14 days and had gained over 15% of her weight recorded during admission. She was comforted to know that Rebati did not show any signs of infection or oedema, and had received the micronutrients she needed. The counsellor even checked if she was confident that she could give Rebati the food she needed at home. She knew that she would have to bring her child back 15 days later and then 1 month and 2 months after discharge to the NRC.

Good outcomes at CHC Rabanaguda Like with Rebati, this studious application of guidelines to the treatment and support of SAM children has resulted in the following beneficial outcomes:

- Mothers are able to prepare local nutritive (home based) food for their children after discharge.
- Mothers are now washing their hand before preparing food and after serving the food.
- Cases of relapse have decreased.
- Referrals from the NRC have decreased.
- Follow-up visits to the NRC have increased.
- Immunization coverage has increased.

Admission in NRCs

Source of knowledge about the NRC among the mothers is an important factor in decision making. The primary data collected from mothers of SAM children showed that 80.2% of them came to know about the NRC from frontline workers, 4.4% from the Paediatric OPD, and 15.4% from others.

Primary data reveals that 51.8% of mothers had visited another service provider to seek the treatment of child with SAM even after being informed that the child urgently needs admission at the NRC. Of those visited other facilities, 72.3% went to the government hospital, 13.2% went to the private hospital/clinic, 22.0% visited jharphuk/vaidya, and 3.8% visited other places for treatment of their children. Of those who visited jharphuk/vaidya, 45.7% were from NRCs located in ITDA areas and 54.3% were from NRCs located in non-ITDA area.

The primary data was also analysed to see the time gap between the identification of child with SAM and admission at the NRC. Of the 308 mothers, 47.1% informed that they admitted the children at the NRC on the same day of identification, 26.3% admitted the children within few days of the week, 8.1% made the admission after one week, 8.8% admitted the children after 15 days, and 9.7% of the children made the admission after one month.

Qualitative information gathered during IDIs and FGDs provide useful information on the reasons for delay in taking the admissions



Graph 8 : Time taken to bring child to NRC for treatment (Sep-Oct 2016)

at NRCs. For example, it is not easy to convince mothers to admit their children at the NRC immediately, as they would have to make alternative arrangements to take care of other siblings. The mothers themselves go to wage labour for daily income, and hence moving with their child to the NRC represents a potential loss of income. Mothers therefore, prefer to come to the NRC when no work is available to them. Although mothers get a wage compensation amount of Rs 50 per day for loss of wages until the child is discharged from the NRC, this was felt to be lower than the amount that they receive from daily wages.⁵⁸

Primary data from mothers was analysed to understand the most important barriers for coming to the NRC for treatment. It is important to mention here that data was collected from the mothers of admitted children at the NRC. Hence the views expressed by them should be considered in that context. The result showed that 47.7% mothers mentioned that there was no barrier to using the NRC. Another 15.1% mentioned other siblings to take care of as a barrier, 10.1% mothers mentioned lack of time, 10.6% mothers reported loss of income, and 1.1% reported NRC was too far, and only 0.8% mentioned they do not have faith in government facility.

IDI with NRC staff and district officials found that for mothers living in remote areas transportation is a major barrier for coming to the NRC. Apart from the higher transportation cost, when the distance of the NRC is too far ASHA take less interest to accompany them for the admission. As per the state operational guideline Rs.50 is given to ASHA to accompany one SAM case on admission. From the FGD with frontline workers it was emerged that ASHA found the Rs 50 amount very less as the entire day is spent and they had to incur the transportation cost for the round trip. Qualitative information from IDIs and FGDs provided additional insights. Barriers to admission that were reported include: sometimes cases referred by frontline workers on the basis of MUAC measurement are denied admission because the reading was faulty; or when beds are full, new cases are sometimes denied admission requiring them to return to the NRC once more. Facilitation by some MOs was also reported: in one NRC when beds are full, SAM cases are temporarily admitted to the Paediatric ward and shifted to the NRC when beds become available.⁵⁹

The analysis of primary data from mothers indicated that 62.0% of SAM children had medical complications (fever/ cough/ loose motion/ swelling of feet) at the time of admission. SDH BALIGUDA, VSS MC Burla, SDH CHAMPUA, CHC Jajpur Road, CHC Khandapada and Sishubhawan Cuttack only had children with medical complications. IDIs with District and state officials suggest that the child is brought to the NRC when s/he is in an advanced stage of ill-health.

Follow-Up of Children Discharged from NRC

According to the state's Operational Guidelines, children discharged from the NRC should be followed up by the frontline workers to ensure that the child is enrolled in and benefits ICDS' Supplementary Nutrition Programme. The child is expected to be brought to the NRC for at least three follow-up visits. The first and second follow-up visits are to be atintervals of 15 days after discharge, and the third visit at the end of 2 months from the date of discharge.

Workers keep a track of the discharged children while conducting home visits, noting details from discharge slips, and keeping the cases under special observation. However, due to the remoteness of certain locations and the vast population, keeping track of every discharged children becomes difficult. For children in remote areas,lack of mobile connectivity means that it is challenging to informparents about the date of follow-up.⁶⁰

During follow-up, the child's weight, length and MUAC are measured. Medicines which were given at the time of discharge are checked to be sure that they are being taken properly. Counselling on appropriate feeding practices is done. The mother gets a compensation of Rs 100 for transportation for each follow-up visit. Some mothers visit the NRC for follow-up as and when they visit the Paediatric department to seek treatment for the discharged child as the NRC is located onthe same premises.⁶¹

⁵⁹NRC IDI&FGD ⁶⁰NRC IDI&FGD ⁶¹NRC IDI&FGD NRC staff feel that many more children return to the NRC for the first follow-up than subsequent ones, with another decline between the second and third follow-up.Several factors contribute to this: mother believes that the child has recovered; opportunity cost to mothers going for daily wage work; unavailability of a convenient mode of transportation; and unavailability of ASHA to accompany the child to the NRC due to other engagements.⁶²This was echoed by mothers of women who had been discharged and were now visiting the NRC for follow-up. Many preferred to come as per their convenience.⁶³

During the FGD, frontline workers mentioned that it is difficult to motivate every discharged case to come for follow-up due to lack of time to do so. During their home visits, mothers were sometimes not at home as they may have left for work. ASHAs felt that the incentive for follow-up to accompany the mother and child for 3 follow-up visits is insufficient as they have to travel 3 times to the NRC. The payment of Rs100 for all 3 visits is made only after the completion of 3 follow-up visits, and it is difficult to convince the mothers to attend the NRC.⁶⁴

NRC staff reported that the majority of follow-up cases come back with a weight lower than when discharged. Reasons for this include: not providing adequate food at home, neglect of the child as the parents go for daily work, and inability to afford quality food due to poverty. This has implications for the programme as the purpose of counselling given to mothers on appropriate feeding and caring practices during their stay at NRCs, is to see that the child recovers completely.⁶⁵

Supply Side Issues

Qualitative information from IDIs with NRC staff revealed that in some NRCs adequate space was a constraint. In some, there is no open space or play area for the children to play which is essential for their physical growth.

Qualitative information provided useful information on the human resource in place in NRCs. At a few places, the ANMs working in the near-by government hospital are deputed to the NRCs. There is no fixed schedule for the visit of the MO to the NRC. The visit timing depends on the OPD work and other emergency requirements. For NRCs located at a distance from the hospital, there is less certainty on the timing of the MO's visit.⁶⁶ Cook-cum-attendants positions are filled through outsourcing (contractors).⁶⁷ District and state officials pointed out that outsourcing of Cook-cum-attendants and delays in recruitment of NC and ANMs are the factors behind the gap between the posts sanctioned and those available in position.⁶⁸

As per the guideline, a Cook-cum-attendant should receive Rs. 8250 per month. However, in practice the remuneration amount for Cook-cum-attendants varies based on the contractor. In a few NRCs it was found that the quality of Cook-cum-attendant- filled through contractors was not good enough and training them to prepare therapeutic diet for children remained a challenge.

62NRC IDI&FGD

- ⁶³Follow-up users IDI ⁶⁴NRC IDI&FGD ⁶⁵NRC IDI&FGD ⁶⁶NRC IDI&FGD ⁶⁷NRC IDI&FGD
- 68District-State Officials IDI

Qualitative information provided useful insights on the updating of registers and records. From the IDIs with NRC staff it emerged that updating of contact information in the registers was a problem in SAM cases brought by the RBSK team as the name and phone numbers of AWW, ASHA and ANM were not readily available. Lack of computer and internet facilities in the NRC are another barrier for updating the records regularly. IDIs with NC revealed that in NRC without the computer and internet facility the counsellors use the computer and internet facility of nearby hospitals to update, upload and send the Monthly NRC Report.

Convergence

The DoHFW and DWCD play an important role in the successful functioning of NRCs. Good coordination between the departments at each level, is crucial for the effective use of facility based management at the NRCs.

The Operational Guidelinescalls out the roles of these departments to ensure monitoring and supervision. At the district level the progress of the NRC is to be reviewed during the monthly convergence meeting of ICDS & Health, chaired by the DM. At the state level, the progress of the NRC is to be reviewed regularly in the Child Health review meetings and convergence meeting of the DoHFW and DWCD.

IDIs with district and state officials provided insights into the convergence efforts. The district level review meeting under the chairmanship of DM takes place in which district level officials from the 2 departments participate. Discussion also takes place on the functioning of NRCs during the MMR/IMR review meeting, also chaired by the DM. Some districts have very irregular district level review meetings. At some NRCs, operational issues pertaining to SAM cases and functioning of NRC are discussed in sector level review meetings and PHC level review meetings as well.⁶⁹

Microplanning of RBSK team under the NHM is not shared with the DWCD. Since the microplanning contains specific date wise visit of the AWCs by the RBSK team, the sharing of such information with ICDS staff beforehand could be helpful for case mobilization and identification.⁷⁰ There is poor coordination on follow-up of discharged cases from NRCs. AWWs felt that it is the job of ASHA to undertake the follow-up of every discharged case during home visits. ASHAs in turn felt that the AWW is equally responsible for follow-up of discharged cases by ensuring their enrolment at the AWC and growth monitoring of the discharged children.⁷¹

Resources at the NRC

As part of the documentation exercise, a QoC checklist was administered by UNICEF RDC consultants in 46 functioning NRCs.NRC resources in respect of trained Manpower, condition of Measuring Instruments and Kitchen Equipment, availability of Medicines and Essential Charts, andupdating of Records were appraised. Indices were developed so that a fuller understanding of the status of these resources at the NRCs could be captured. A full presentation of the Resources Indices of each NRC is presented in Annexure II.

⁶⁹District-State Officials IDI ⁷⁰District-State Officials IDI ⁷¹NRC IDI&FGD

Manpower

According to the state's Operational Guidelines, a 10-bedded NRC should have 1 MO, 1 NC, 4 ANMs/Nursing Assistants (NA), and 3Cook-cum-attendants. To ensure effective service delivery, training on Facility Based Management of SAM is to be provided to the MO, NC, and ANMs/NA. The Cook-cum-attendants are expected to be trained by the NC on preparation of therapeutic diets (F-75 and F-100).

The QoC data on manpower looked into two parameters: the actual availability of staff against those sanctioned; and the proportion of staff that had received training against those available. It may be noted that training the Cook-cum-attendants has not been included in the analysis as they do not receive any formal training.

Of the total sanctioned,97.8% MOs/Paediatricians, 91.3% NC, 78.3% ANMs/NA and 96.4% Cookcum-attendants were in position at the time of data collection. Staff shortages are hence found mainly with regard to ANMs/ NA with 22% positions vacant. Analysis also was done regarding how many NRCs had the full complement of staff: this showed that 19 out of 46 NRCs have all the staff in position. Two NRCs, DHH KANDHAMAL and DHH Sambalpur,had the least number of staff (4 of 9 sanctioned) in position.

Availability of trained manpower in the NRCs is critical to the effective management and functioning of NRCs. As per the guidelines, the MO, NC, and ANMs/NA should receive 3 days training at the zonal level and the NC should get two days re-orientation training at the state level. From the data it is seen that of the total staff available, 90.0% of them have received training on Facility Based Management of SAM. Analysis by type of staff found that 75.6% of MOs/ Paediatricians, 95.2% NCs and 93.8% ANMs/ NA have received the training.

Graph 9 : Availability and training of manpower in NRCs (Sep-Oct 2016)



A Manpower Index for each NRC was constructed for each NRC by Amaltas. Weights have been assigned to each staff category based on availability and training. The Manpower Indexfound that 11 of 46 NRCs had a perfect score of 10. These NRCs are DHH Bhadrak, VSS MC Burla, SDH Hindol, CHC Khandapada, DHH KORAPUT, DHH MAYURBHANJ, DHH NAWARANGPUR, SDH NILAGIRI,SDH RAIRANGPUR, DHH SUNDERGARH and CHC Umerkote. Among the NRCs, DHH KANDHAMAL had the lowest Manpower Index (5.2).

Measuring Instruments

The availability of functional Measuring Instruments in the NRCs is critical to enable the NRC staff undertake measurements during the admission of the child and during the treatment stage. The administration of the QoC checklist collected information on the availability and functionality of 6 types of measuring instruments; digital weighing machine, infantometer, stadiometer/ wooden height board, MUAC tape, glucometer, and thermometer.

Considering that six types of Measuring Instruments are supposed to be available in each of 46 NRCs, the expected number of Measuring Instruments is 276. At the time of QoC data collection, 96.0% of total instruments were available. Of those available (265), Measuring Instruments that were functional were 92.1%. The data was further analysed for each type of measuring

instruments in the same way to check how many were available, and how many of those available were functional. The result showed that MUAC tapes were available in all 46 NRCs and functional in 97.8% NRCs; digital weighing machines were available in all 46 NRCs and functional in 95.7% NRCs; infantometers were available in 95.7% NRCs and functional in 95.5% NRCs; glucometers were available in 95.7% NRCs and functional in 86.4% NRCs; thermometers were available in 95.7% NRCs and functional in 97.7% NRCs; and stadiometers were available in 89.1% NRCs and functional in 78.0% NRCs.

Graph 10 : Availability and functionality of measuring instruments in NRCs (Sep-Oct 2016)



An index of Measuring Instruments was developed for each NRC. Weights were assigned to various instruments on availability and functionality. Analysis of the Measuring Instruments Index showed that 56.5% NRCs (26 out of 46) had a perfect score of 10. Among the NRCs, the Index of Measuring Instruments is lowest in SDH CHAMPUA (5.8), an NRC located in an ITDA area.

Kitchen Equipment

Kitchen Equipment are essential to prepare the therapeutic diet (F-75 and F-100) for children admitted to the NRC and so that prescribed quantity of food can be given to the children. The QoC checklist obtained information on the availability and functionality of 8 types of Kitchen Equipment; cooking gas, dietary weighing scale, graduated measuring jar, graduated measuring spoon/cup, electric blender (or manual whisks), water filter/RO/ Aquaguard, refrigerator and utensils.

Graph 11 : Availability and functionality of kitchen

equipment in NRCs (Sep-Oct 2016)

Considering that an NRC should have all the 8 types of Kitchen Equipment, the total number of equipment should be 368 in 46 NRCs. The analysis of data revealed that 94.0% of total Kitchen Equipment were available by the time of QoC data collection. Of the total number available, 97.1% (346 out of 368) were found to be in a useable condition. On the basis of advice by the independent reviewer, data was further analysed item wisefor certain equipment. The result showed that dietary weighing scales were available in 95.7% NRCs and of those available, functional in 86.4% NRCs; graduated measuring jars were available in 97.8% cases and of those available, functional in 100.0% cases; electric blenders were available in 87.0% NRCs and of those available, functional in 97.5% cases; and water filter/RO/Aquaguard were available in 93.5% NRCs and of those available, functional in 97.3% cases.

An Index of Kitchen Equipment was developed for each NRC. For each type of equipment,equal weight each was assigned for availability and functionality. The Index of Kitchen Equipment showed that 60.9% NRCs (28 out of 46) had a perfect score of 10. Among the NRCs, the Index of Kitchen Equipment is lowest in DHH Balangir and SDH BONEIGARH (6.3 each) owing to non-availability of some equipment.

Medicines

Availability of medicines at the NRCs is critical for the treatment of SAM child. The QoC checklist sought information on the availability of Antibiotics/drugs, Electrolytes and minerals, and Micronutrients. Items under Antibiotics/drugs include ampicillin/amoxicillin, cefotaxime/ ceftriaxone/gentamycin, albendazole, antibiotics eye drops; items under Electrolytesand minerals include Oral Rehydration Solution, potassium chloride syrup, magnesium sulphate ampoules; and under Micronutrients include iron syrup, multivitamin, folic acid, vitamin A syrup, zinc tablets/syrup.

Every NRC should have all 12 types of medicines. The analysis of QoC revealed that of 552 medicines that should have been available across 46 NRCs, 94.9% of medicines were available at the time of data collection. On the suggestion of the independent reviewer, the data was further analysed item wise for certain types of medicines. The analysis found that ampicillin/ amoxicillin were available in 93.5% NRCs, cefotaxime/ceftriaxone/gentamycin were available in 87.0% NRCs, albendazole in 97.8% NRCs, potassium chloride syrup in 91.3% NRCs, magnesium sulphate ampoules in 97.8% NRCs, multivitamins in 95.7% NRCs, folic acid in 97.8% NRCs, and vitamin A in all the NRCs.

An Index of Medicines was developed for each NRC. Equal weight was given for availability of each of these 12 medicine items. Analysis of Index of Medicines found that 63.0% NRCs (29 out of 46) had all the 12 medicine items available. Among the NRCs, the index of medicine is lowest in CHC Saintala (5.8) owing to non-availability of 5 items out of 12. In DHH Balasore, the index of medicine is found to be 6.7 due to the non-availability of 4 items.

Essential Charts

As per the state's Operational Guidelines, essential charts are to be displayed at the NRCs. The essential charts contain useful information on electrolytes, micronutrients and about therapeutic diets. The QoC checklist obtained information on the availability of 4 types of charts in the NRCs. These were: Ready reckoner on electrolytes and micronutrients; F-75, F-100 charts to be displayed in the NC's room; F-75, F-100 charts to be displayed in the kitchen; and Weight for length/height charts.

Considering that an NRC should have all the 4 types of essential charts for 46 NRCs, the expected number of charts is 184. The analysis found that 93.5% (172 out of 184) of charts were available in the NRCs at the time of QoC data collection. The analysis of data by type of chart showed that Weight for length/height charts were available in all the 46 NRCs, Ready reckoner on electrolytes and micronutrients were available in 93.5% NRCs, Display of F-75, F-100 charts in the NC's room were found in 89.1% NRCs, and Display of F-75, F-100 charts in the kitchen were found in 91.3% NRCs.

An Index of Essential Charts was developed for each NRC. Equal weight was given for the availability of each type of essential chart. The analysis of index of essential chart points out that in 76.1% NRCs,(35 out of 46) all the four types of chart were available. Among the NRCs, the Index is lowest in DHH Sambalpur (5.0) owing to the non-availability of 2 charts out of 4.

Records

Certain Records are to be maintained at the NRC. These Records contain important information on the progress of children admitted and exit indicators of the NRC. Unless periodically updated, the Monthly and Quarterly Report to be submitted to the DoHFW and NRHM by the 10thday of every month cannot be done. The QoC checklist obtained information on the availability and updating of 6 types of Records in the NRCs. These are the: NRC Admission register; Discharge ticket; NRC Follow-up register; Contact information register; Child information sheet; and Monthly NRC report.

For 46 NRCs, the total number of records (taking 6 types as essential) is 276. Analysis found that 97.8% (270 out of 276) of records were available at the time of QoC data collection. Of the total available, the proportion of records updated were 95.9% (259 out of 270). The data was further analysed for each type of record. The result showed that Admission registers were available and updated in all 46 NRCs; Discharge tickets were available in 95.7% NRCs and of these, updated in 97.7% NRCs; Follow-up registers were available in 97.8% NRCs and of these, updated in 93.3% NRCs; Contact information registers were available in 93.5% NRCs and of these, updated in

86.0% NRCs; Child information sheet were available all NRCs and of these,updated in 97.8% NRCs; and NRC Monthly NRC reports were available and updated in all 46 NRCs.

For each NRC an Index of Records was prepared. For each type of register,equal weights were assigned on availability and updating status. Analysis of the Index of Records found that in 65.2% NRCs (30 out of 46) all the six registers were available and updated.





Quality of Care at NRCs

From the existing literature it is well acknowledged that QoC is complex, context-based and multifaceted. The lack of one universal definition makes measuring the QoC more difficult. To identify the key characteristics of QoC, eight well known frameworks of QoC were reviewed by Amaltas. The frameworks include:Donabedian Framework of 1988; Bruce-Jain Framework of 1990; Maxwell's six dimension of QOC (1992); Department of Health, UK Framework (1997); The Council of Europe Framework for QoC; WHO Universal QoC Framework (2000); Institute of Medicine Framework (2001); and Joint Commission on Accreditation of Healthcare Organizations (JCAHO) Framework of 2006.

From the review and synthesis five key characteristics of QoC were identified. These were Effectiveness, Efficiency, Equity, Patient Centeredness, and Safety. Taking into account the technical aspects of NRC and quality assessmentin the QoC checklist, variables were identified to map to each of these five quality parameters. The list of variables were shared with UNICEF and finalized after due consultation. To make the characteristics measureable and comparable across the NRCs, an index was developed for each of these characteristics. The data and information on each variable was collected through administration of QoC checklist in the 46 NRCs. A full presentation of the Quality of Care Indices of each NRC is presented in Annexure I.

Effectiveness Index

Variables in the QoC checklist that mapped to the Effectiveness Index are: feeds are given at the prescribed times, even on nights and weekends; children are fed with a cup; blankets are provided and children kept covered at night; weighing scales are standardized weekly; staff adjust the scale to zero before weighing; and designated kitchen area (separate from the ward and duty rooms) at NRC. Effectiveness Index was developed for each NRC. For each variable practiced or present in the NRC, an equal weight was given.

The analysis of effectiveness index showed that 43.5% NRCs (20 out of 46) had a perfect score of 10. Among the NRCs, the index of effectiveness is lowest in DHH Boudh (3.3) as 4 of the 6 variables were not present/practiced. Another NRC with lowest index is DHH Balangir (5.0) where 3 out of the 6 variables were not present/practiced.

The analysis of data by each variable across the NRCs showed useful information. Data on two variables worth mentioned here: blankets are provided to children at night and practice of weighing scales standardized weekly. It was found that blankets for child were not available in 14 NRCs of the 46 NRCs, and weekly standardization of scales were not practiced in 18 NRCs. The analysis also showed that a separate kitchen facility was not available in 5 NRCs. The 5 NRCs were DHH Balangir, DHH Boudh, VSS MC Burla, DHH DEOGARH and SDH KARANJIA.

Efficiency Index

The Efficiency Index for an NRC took into account: bed occupancy rate and recovery rate. For the calculation of the index, a weight of 1 was given If BOR \ge 100%, and same weight was given if recovery rate \ge 75%.

The Efficiency Index was calculated for 45 NRCs as yearly BOR was not available for DHH Balasore established in June 2016. The findings showed that 6.7% NRCs (3 out of 45) had a perfect score of 10. NRCs with a perfect score on efficiency are: DHH KORAPUT, CHC Rabanaguda and CHC Umerkote.

Equity Index

The Index of Equity took into account the proportion of admissions for a subgroup (SC and ST) out of total yearly admissions in a NRC relative to the proportion of population for that subgroup (SC and ST) in the population of the district in which the NRC is located. APR data of 2015-16 was used for the calculation of the index.

The Equity Index was calculated for 45 NRCs as yearly admission data was not available for DHH Balasore, established in June 2016. The analysis pointed out that all the 18 NRCs located in ITDA areas had met the equity criteria for ST admission. Twenty five out of 27 NRCs in non-ITDA have also met the criteria, indicating a high use of the NRCs by the ST population. In 17 out of 45 NRCs, proportion of SC admissions are less than the proportion of district SC population.

Safety index

On Safety, the variables used are: NRC staff wash their hands with soap before handling food; mothers wash their hands with soap after using toilet or changing diapers; trash disposed of properly; ward kept as free as possible of insects and rodents; ingredients and food kept covered and stored at the proper temperature; leftovers discarded; and dishes washed after each meal. For safety index each of these seven variables practiced or present in the NRC was given an equal weight.

The analysis of the Safety Index showed that 89.1% NRCs (41 out of 46) had a perfect score of 10. Among the NRCs, the Index of Safety is lowest in DHH Boudh (5.7) as 3 of the 7 variables were not present/practiced.

The analysis of data by each variable across the NRCs showed useful information. The result showed that all the NRCs had ward free of insects and rodents, ingredients and food kept covered and stored at the proper temperature, leftovers discarded, and dishes washed after each meal. In one NRC (DHH Boudh) staff and mothers were not washing their hands with soap. It was found that in three NRCs (DHH Balangir, DHH Boudh, DHH DEOGARH) trash disposal was not proper.

Patient Centeredness Index

Variables used from the QoC checklist in constructing the Index on Patient Centeredness are: surroundings welcoming and cheerful; mothers offered a place to sit and sleep; NRC has a separate area for bathing and toilets for mothers/caregivers; mothers taught/encouraged to be involved in care; demonstration of low cost energy food with mothers/caregivers being done; staff's consistently courteous; and play toys available. For the Patient Centeredness Index, each of these seven variables practiced or present in the NRC was given an equal weight. The index has been calculated by summing the individual scores of all variables.

The analysis of Patient Centeredness Index showed that 78.3% NRCs (36 out of 46) had a perfect score of 10. Among the NRCs, the Index of Patient Centeredness is lowest in DHH DEOGARH (5.7) and SDH GUNUPUR (4.3) as 4 of the 7 variables were not present/practiced.

The analysis of data by each variable across the NRCs showed additional information. It was found that staff behaviour was good in all the NRCs. In all the NRCs expect DHH DEOGARH mothers were taught/encouraged to be involved in care. There were two NRCs each in which adequate space was not available for mothers to sit and sleep (DHH GAJAPATI, SDH GUNUPUR) and separate area for mothers for bathing and toilets were not available (DHH Balangir, DHH Boudh,). There were seven NRC where surroundings not pleasant and clean:DHH Balangir, DHH DEOGARH, DHH GAJAPATI, SDH GUNUPUR, CHC Khandapada, DHH Nayagarh, and SishuBhawan. In 4 NRCs each, demonstration of low cost energy food with mothers was not done (DHH Boudh, DHH DEOGARH, SDH GUNUPUR, DHH Jharsuguda, DHH Nayagarh).

Box 4: Best practice: DHH Mayurbhanj

Detection of cases is critical to early detection and successful treatment of SAM. The RBSK, implemented under the National Health Mission, is an important initiative directed to early identification and intervention in the 4D's: deficiency, defects, disease and developmental delays, of children from birth until 18 years. For SAM, which falls into the 'deficiency' category of services provided by RBSK, new-borns (0-6 weeks) are screened at public health facilities while preschool children below 6 years of age are screened by Medical Health Teams at the AWC at least twice a year. RBSK is an important resource that is filling beds at the DHH MAYURBHANJ.

Field screening of cases Gopal* was 2 years old, not eating well, was cranky and was falling ill all the time. Gopal's mother had come to the AWC and she came to know from the AWW that the RBSK team was coming the next day to screen the children. She wanted them to take a look at her son. The RBSK vehicle arrived. The doctor and other team members



used the stadiometer to record the height of the child and weighed the child using a weighing scale. The vehicle had the full complement of equipment needed for anthropometry to undertake field screening for SAM cases. Other mothers had also come to show their children to them. Two children including Gopal were identified as SAM. Gopal's mother received a screening and referral card in which all of the relevant information was recorded. AWW informed her that she need to visit the NRC for admission in the RBSK vehicle. She was initially hesitant as the NRC was far off. AWW told her that her child will be fully safe as the doctor and other team members will travel in the same vehicle. She agreed and they got to ride the RBSK vehicle to the NRC for admission on the same day.

NRC staff feels that the RBSK mobile health team is a major boost to the identification of SAM among pre-school children. Unlike the frontline worker who are still using the weight for age criteria and MUAC, the RBSK team identifies SAM children on the basis of the WHO recommended WHZ score; rejection of any recommended cases during the admission process at the NRC is unlikely. The entire process of screening, identification, transportation of children to the NRC and admission is completed in one day.

Remaining challenges Two challenges remain. Firstly, the RBSK team makes a maximum of two visits to any one AWC missing any children who may develop acute malnutrition in the intervening period. The second issue is with the sharing of information between the departments of Health and WCD. Discussion with District officials of DWCD point out that the micro-plans of the RBSK team is not shared with the DWCD in advance. Hence, the sharing of information between Health and WCD at the district level requires strengthening.

Scope for convergence A District Early Intervention Centre (DEIC) is operational at the District Hospital. The mandate of the DEIC is to provide referral support to children detected with health conditions during health screening. Among the children admitted to the NRC, some have symptoms of developmental delays and disability, especially vision impairment, hearing impairment and language delay. These cases from the NRC could be referred to the DIEC for confirmation of diagnosis, and treatment. Since both the NRC and DIEC is located in the premises of the district hospital, this could result in both better outcomes for the child as well as reduce the burden of parents in visiting the hospital over and over again.

For Gopal and his mother, the RBSK has been a blessing indeed.

4DISCUSSION AND CONCLUSION

This documentation was undertaken to appraise the functioning of NRCs in Odisha. This chapter discusses the status of key performance indicators of NRCs of Odisha and presents a comparative analysis with the situation in other states, the overall national picture and international standards of care. Bottlenecks and best practices are highlighted with a view to consider the needs of the programme at this stage of expansion of facility based management of SAM. On the basis of this discussion, a set of practical recommendations is provided to strengthen the programme in the state.

Discussion

Between 1 April 2014 and 31 March 2016, a total of 12,718 children with SAM were admitted to the 45 NRCs in the state. Of the admissions, 53.0% were girls and 47.0% were boys. This gender distribution is comparable tothat of Jharkhand (55.0% girls and 45.0% boys), but not so of Uttar Pradesh which shows a lower proportion of girls (45.4%) than boys (54.6%).^{72,73}

The overall death rate for two years combined was 0.1%. The death rate in NRCs in Odisha is much lower than national and international standards of care (<5%).^{74,75} This holds significance as one of the objectives of establishing NRC is to reduce fatality rates among SAM children. When compared with findings from other states, it is observed that the death rate is lower also than that of Jharkhand (0.6%) and Uttar Pradesh (1.2%).^{76,77}

Outcome	2014	1 -15	201	5-16	То	tal
Outcome	n	%	n	%	n	%
Deaths	13	0.2	4	0.1	17	0.1
Defaulters	706	13.0	662	10.5	1368	11.7
Discharged, recovered	4291	79.3	5142	81.9	9433	80.7
Discharged, unrecovered	403	7.4	467	7.4	870	7.4
Total exits	5413	100.0	6275	100.0	11688	100.0

Table 4 : Performance indicators in NRCs in Odisha (April 2014 to March 2016)

Source: APR, FY2014-15 & FY2015-16

⁷²VM Aguayo et al. (2012). Providing care for children with severe acute malnutrition in India: new evidence from Jharkhand, Public Health Nutrition, 17(1).

⁷³K Singh et al. (2014). Management of Children with severe acute malnutrition: Experience of Nutrition Rehabilitation Centres in Uttar Pradesh, India.Indian Pediatrics, 51.

⁷⁴The Sphere Project. (2011). Humanitarian charter and minimum standards in humanitarian response, 3rd ed. Northampton: Belmont Press Ltd.

⁷⁵Ministry of Health and Family Welfare. (2011). Operational guidelines on facility based management of children with severe acute malnutrition. Available at: http://www.cmamforum.org/Pool/Resources/Operational-guidelines-on-facility-based-management-of-children-with-severe-acute-malnutrition-India-2011.pdf (Accessed on 24 August 2016).

⁷⁶VM Aguayo et al. (2012). Providing care for children with severe acute malnutrition in India: new evidence from Jharkhand, Public Health Nutrition, 17(1).

⁷⁷K Singh et al. (2014). Management of Children with severe acute malnutrition: Experience of Nutrition Rehabilitation Centres in Uttar Pradesh, India.Indian Pediatrics, 51.

During FY2014-15 & FY2015-16 combined, 11.7% of the children defaulted from the NRCs. This proportion is also lower than the defined standards of care for defaulter rate (<15%).^{78,79} Findings from other states show a different picture. In Jharkhand, the defaulter rate was 18.4%. In Uttar Pradesh 47.2% SAM children defaulted from NRCs. Thus the picture in Odisha is much better than in comparator states about which data has been published in the public domain.

Graph 13 : Comparison of default rate in NRCs (2014-16)



During the two year period, 88.2% of the total exits (11,688) were discharged from the NRC. This is comparable to the figure in Jharkhand (81.0%) and from Delhi (84.1%).^{80,81} However the proportion is much higher when compared to the findings in Uttar Pradesh (51.7%). ⁸²The average LOS for those discharged is 15 days. This figure is comparable to the findings from a tertiary care hospital of Delhi (11.7 days). ⁸³

Of the total exits from NRCs in the state, 80.7% children discharged gained at least 15% of their initial weight. This proportion of children that had reached the prescribed minimum weight gain is higher than the national and international standards of care for recovery rate (>75%). The state figure on discharged with minimum 15% weight gain was much higher than that of Jharkhand (31.9%), Uttar Pradesh (24.2%), and Delhi (47.2%). This signifies a good achievement of the NRCs in the state.^{84,85,86}

Graph 14 : Comparison of total discharged from NRCs (2014-16)



⁸⁰VM Aguayo et al. (2012). Providing care for children with severe acute malnutrition in India: new evidence from Jharkhand, Public Health Nutrition, 17(1).

⁸¹K Singh et al. (2014). Management of Children with severe acute malnutrition: Experience of Nutrition Rehabilitation Centres in Uttar Pradesh, India.Indian Pediatrics, 51.

⁸²K Singh et al. (2014). Management of Children with severe acute malnutrition: Experience of Nutrition Rehabilitation Centres in Uttar Pradesh, India.Indian Pediatrics, 51.

⁸³P Singh et al. (2016). Experience and outcome of children with severe acute malnutrition Using locally prepared therapeutic diet. Indian Journal of Pediatrics, 83(1).

⁸⁴VM Aguayo et al. (2012). Providing care for children with severe acute malnutrition in India: new evidence from Jharkhand, Public Health Nutrition, 17(1).

⁸⁵K Singh et al. (2014). Management of Children with severe acute malnutrition: Experience of Nutrition Rehabilitation Centres in Uttar Pradesh, India.Indian Pediatrics, 51.

⁸⁶P Singh et al. (2016). Experience and outcome of children with severe acute malnutrition Using locally prepared therapeutic diet. Indian Journal of Pediatrics, 83(1).

⁷⁸The Sphere Project. (2011). Humanitarian charter and minimum standards in humanitarian response, 3rd ed. Northampton: Belmont Press Ltd.

⁷⁹Ministry of Health and Family Welfare. (2011). Operational guidelines on facility based management of children with severe acute malnutrition. Available at: http://www.cmamforum.org/Pool/Resources/Operational-guidelines-on-facility-based-management-of-children-with-severe-acute-malnutrition-India-2011.pdf (Accessed on 24 August 2016).

In the state, the average weight gain between April 2014 and March 2016 of discharged children was 9.6 g/kg body weight per day. This was higher than the national and international standard of care for minimum average weight gain (>=8g/kg body weight per day). This figure was comparable with the result from Jharkhand (9.6 g/kg body weight per day) and a tertiary care hospital in Delhi (9.3 g/kg body weight per day).⁸⁷⁸⁸

Graph 15 : Comparison of discharge with target weight gain from NRCs (2014-16)



In Odisha, the average weight gain per day was 11.2 (g/kg body weight) among those discharged with a weight gain of 15% or more of their initial weight, and that among discharged with less than 15% weight gain, the average weight gain was 9.1 g/kg body weight per day. In Jharkhand the average weight gain among the discharged with 15% or more weight gain was higher (14.7 g/ kg body weight per day) while the figure was same among discharged with less than 15% weight gain (6.3 g/kg body weight per day).⁸⁹

From these findings, it can be concluded that the status of the performance indicators in the NRCs of Odisha have met the prescribed national and international standards of care. In addition, the performance of NRCs on key indicators show better progress than findings from comparator locations in the country that also use WHO prescribed interventions for the treatment of SAM children.

Barriers to utilization of NRC services can be from the demand side and supply side. On the demand side one of the important barriers is the lack of awareness among parents about the importance of nutrition. Studies show that parents do not take the issue of undernutrition seriously, and some families might prefer alternatives to facility based treatment such as faith healing.⁹⁰ Primary data collected from this study points out that majority of mothers (51.8%) visited another service providers including the jharphuk/vaidya to seek the treatment of their SAM child.

⁸⁷VM Aguayo et al. (2012). Providing care for children with severe acute malnutrition in India: new evidence from Jharkhand, Public Health Nutrition, 17(1).

⁸⁸P Singh et al. (2016). Experience and outcome of children with severe acute malnutrition Using locally prepared therapeutic diet. Indian Journal of Pediatrics, 83(1).

⁸⁹VM Aguayo et al. (2012). Providing care for children with severe acute malnutrition in India: new evidence from Jharkhand, Public Health Nutrition, 17(1).

⁹⁰Rogers E,Myatt M, Woodhead S, Guerrero S, and Alvarez JL. (2015). Coverage of community-based management of severe acute malnutrition programmes in twenty-one countries, 2012-2013. PLoS One, 10(6). Available at http://www.ncbi.nlm.nih.gov/pmc/articles/ PMC4456359/

Studies from other locations in India show that the high opportunity costs for agricultural workers in the form of wage loss incurred while at the NRC may act as a deterrent in coming to the NRC for treatment, or completing treatment for the full length of time.^{91,92} Qualitative information from this study points out that opportunity costs associated with wage labour act as a potential barrier to stay in the NRC for treatment till the child is discharged from NRC. Other barriers to come to the NRC for treatment are lack of proper transportation facility in remote areas andless interest among ASHA to accompany the SAM cases.

An earlier study conducted in Odisha mentions transportation costs to and from the NRC as a major barrier for families to undertake follow up visits required.⁹³ Qualitative information from this study also found that unavailability of a convenient mode of transportation remains an important barrier for follow-up visits. The other important barriersthat emerged are opportunity cost of mothers going for daily wage work and the perception among mothers that the child appears healthy after discharge.

On the supply side, lack of effective collaboration between frontline workers and by them with the NRC may lead to poor uptake of services. This may be due to factors such as inadequate compensation or incentives to the frontline worker, andpoor coordination between the frontline workers to follow-up the discharged cases.⁹⁴ Qualitative information from this study found that ASHAs are not happy with the present system of payment of Rs100 after the completion of 3 follow-up visits as this amount is not sufficient for the 3 trips, Further because they find it difficult to convince the mothers to complete all the 3 visits, this amount is also not reimbursed to them. AWWs and ASHAs cannot motivate every discharged case to come for follow-up due to other work priorities. Sometimes workers find that the mothers of SAM children have left for work when they visit their homes.

Resourcing of the NRCs of the state is good. Availability of Manpower is generally good, with the exception of ANMs/NAof which21.7% are not in position. The status with regard to training of manpower on facility based management of SAM is good except for MOs/ Paediatricians who had not received training in 24.4% of cases. Of the total 46 NRCs, 11 had a perfect score of 10 on the Manpower Index. Measuring Instruments are generally available (96.0%) and when available, usually found to be in working condition (92.1%). In the case of Measuring Instruments Index, 26 out of 46 NRCs had a score of 10. Similarly, Kitchen Equipment is commonly (94.0%) in place and generally (97.1%) in working order. The Kitchen Equipment Index shows that 28 out of 46 NRCs had a perfect score. Medicines are most often available (94.9%) and the Index of Medicines was found to be perfect in 29 out of 46 NRCs. Essential Charts are likewise available (93.5%). The Index of Essential Charts is a perfect 10 for 35 out of 46 NRCs. Finally, Records are usually available (97.8%) and updated (95.9%). The Records Index is 10 for 30 out of 46 NRCs.

⁹¹Mathur A, Tahilramani G, Yadav D, Devgan V. (2016). Experience in managing children with severe acute malnutrition in nutrition rehabilitation centre of tertiary level facility, Delhi, India. International Journal of Contemporary Pediatrics, 3(2), 597-600. Available at: http://dx.doi.org/10.18203/2349-3291.ijcp20161046(Accessed on 31 August 2016).

⁹²Bariyar N. (2015). Role of NRCs (Nutrition Rehabilitation Centres) in preventing malnutrition related deaths among under 5 children in Odisha. Available at: http://iphindia.org/role-of-nrcs-nutrition-rehabilitation-centre-in-preventing-malnutrition-related-deathsamong-under-5-children-in-odisha/ (Accessed on 27 August 2016)

⁹³Bariyar N. (2015). Role of NRCs (Nutrition Rehabilitation Centres) in preventing malnutrition related deaths among under 5 children in Odisha. Available at: http://iphindia.org/role-of-nrcs-nutrition-rehabilitation-centre-in-preventing-malnutrition-related-deathsamong-under-5-children-in-odisha/ (Accessed on 27 August 2016)

⁹⁴UNICEF state office for Odisha. (2013). Management of severe acute malnutrition.

Quality of Care at the NRCs is good in respect of Safety and Patient Centeredness. Effectiveness, Efficiency and Equity is a problem in certain locations. The Equity Index is generally higher for NRCs located in ITDA areas, while the Effectiveness and Equity Indices appear not to follow any particular pattern. Only 3 of the 45 NRCs had a perfect score on all counts of quality of care – this is something that the state may like to address as it moves forward in its efforts to both improve NRC services as well as extend their reach.

Graph 16 : Quality of Care Index by division



Conclusions & Recommendations

The state has a large population of under-fives with SAM. They live in far-flung areas with the larger proportion living in ITDA areas. They generally attend the local AWC and are weighed regularly by the AWW. Many mothers have been informed by frontline workers that they need to visit the NRC since the child has a degree of undernutrition that requires intervention. For a variety of reasons, including the opportunity cost of a 2-3 week stay at the NRC, mothers avoid or delay coming to the NRC. A very small proportion makes it to an NRC; just under half have a WHZ of \leq -4SD. When they do come, most stay for the full course and their children gain weight. However, once they go back to their homes, complacency, difficulties in both transportation, and lack of motivation result in a declining follow-up rate.

This trajectory is both heartening and concerning. It is heartening because so many people who access the NRC services, gain much from coming to the facility. It is concerning because few make it to an NRC at all. A number of recommendations are being suggested in this regard.

Strengthening of Field-Facility Linkages

An underlying assumption made when establishing an NRC, is that there is a large pool of SAM cases in the field which require hospitalization in order to improve, and demonstration of locally prepared nutritional rehabilitation diets so that they can continue to improve at home. The estimated annual case load of SAM among children between 6 months to 5 years in the state is 3,16,000. Beds at the NRCs are expected to be in use almost all the time. But this is not the case.

BOR is low. According APR data, the average BOR, an indicator that captures bed utilization over a period of time, was 56.6 in FY2014-15 and 61.4 in FY2015-16. The manpower and infrastructure dedicated to SAM rehabilitation is underutilized when BOR is low. This underscores the need to have a larger intake of children with SAM for the optimum utilization of resources.

VHND platform has not been able to identify all the cases. Although the monthly VHND is the most important platform for identification of SAM cases, the attendance at VHND is erratic. Attendance is particularly difficult for families residing in distant places, and for those where the woman of the house goes out of the home for work every day. Frontline workers play an important role in the identification of cases during the VHND, yet they are not very keen to mobilize the families for VHND due to competing priorities.

Recommendations

- Frontline workers need to focus on identification of SAM cases through the VHND platform. To achieve this AWW and ASHA should work in coordination. While the AWW should focus more on weight measurement of every child and preparation of growth chart for detection of growth faltering, the ASHA should put more effort into mobilization of VHND attendance especially among the parents in the far off places. The state's MMR/IMR strategy will be a big boost in this regard.
- Triple A forums of the ANM, AWW and ASHA, such as those being put in place in Bihar and Uttar Pradesh, could be considered. The routinisation of a review meeting between these key functionaries will help in the identification of both growth faltering children as well as frank SAM cases.
- Strengthen the supervision mechanism at the ICDS sector level in order to make the frontline workers more accountable.

Expansion of Rehabilitation Services to the Community

NRCs are able to cater to only a fraction of the cases in the state.The average number of admissions per year accounts for 2.0% of the estimated annual case load of SAM.Between FY2014-15 and FY2015-16 there has been an increase of 800 admissions of SAM children, a movement in the right direction. However, it seems unlikely that the facility based approach in the NRCs can meet the need for rehabilitation services of the SAM population in the state.

The demand for treatment at NRCs is wide-ranging. The positive exit indicators, and the overall good infrastructure at NRCs in the state means that there is a high demand for services. Analysis of the MPR data of 3118 cases found that while 32.8% cases came from the same block in which the NRC is located, the remaining two thirds came from neighbouring blocks, other blocks, and even other districts. This underscores the fact that demand for treatment at NRCs is widespread and transcends the difficulties posed by transportation.

Recommendations

In order to cater to the uncovered SAM population, three options should be weighed.

- Option 1: Expansion of NRC network by establishing new NRCs. The expansion of facility based rehabilitation of SAM children through establishment of new NRCs would require trained manpower at place, infrastructure, and availability of medicines and drugs. It would also mean that persons would have to travel much further than they do at present to avail the services as more and more people access these services. It should also be borne in mind that there is already considerable underutilization of the NRC network at the present time, and this expansion may well result in greater inefficiency.
- Option 2: Introduction of CMAM for treatment of SAM cases without medical complications. Community-based therapeutic care for SAM children without complications, already supported by UNICEF globally, would become a key component of the continuum of care for children with SAM. Emerging global evidence shows that good quality RUTFs are effective in supporting rapid catch-up growth in children with SAM and can be safely used in communitybased programmes.^{95,96}

⁹⁶WHO, WFP, SCN &UNICEF. (2007). A joint statement: Community based management of severe acute malnutrition. Available at http:// www.who.int/nutrition/topics/Statement_community_based_man_sev_acute_mal_eng.pdf (Accessed on 26 August 2016).

⁹⁵Diop El HI et al. (2003). Comparison of the efficacy of a solid ready-to-use food and a liquid, milk- based diet for the rehabilitation of severely malnourished children: a randomized trial, American Journal of Clinical Nutrition, 78.

 Option 3: Introduction of intermediate level, facility-based services at 24*7 CHCs across the state. This option could leverage existing facilities available at 24*7 CHCs to treat the SAM cases without complications. This would require training of CHC staff and availability of infrastructure and ready-to-use therapeutic foods. This will ensure that facility based services are available closer to the community making both admissions and follow up easier.

• Expansion of Services in Tribal Areas

There is higher use of NRC services in tribal areas.Despite expectations to the contrary, an analysis of APR data on BOR, shows that 11 of the 18 NRCs located in ITDA areas have consistently performed better than the state average over the 2 years. In the same time period, only 4 out of 25 NRCs in non-ITDA area had a BOR better than the state average.

There is a felt need for NRC services: National and international standards of care prescribe that recovery rate in the NRC should be more 75%. Analysis of APR data revealed that 14 of the 18 NRCs located in ITDA areas were able to achieve the acceptable recovery rate, while 15 of the 27 NRCs from non-ITDA areas were able to meet it. It was also found that the defaulter rate was 10.4% in NRCs located in ITDA area and 12.0% in NRCs in non-ITDA area. These findings indicate that not only is there appetite for NRC services in the tribal areas, these are being utilised to advantage by persons residing there.

Health seeking behaviour in tribal areas and non-tribal areas is similar.Primary data collected from mothers of SAM children reveal that they have taken recourse to several healers. Among those who visited other service providers to seek a solution to their child's condition, 22.0% visited jharphuk/vaidya. Contrary to popular belief, it was found that among those who visited jharphuk/vaidya, 45.7% were from NRCs located in tribal areas and 54.3% were from NRCs located in non-tribal area.

The prevalence of SAM is more in tribal areas. Analysis of the NFHS-4 data shows that SAM prevalence in tribal areas (7.4%) is more than in non-tribal areas (5.6%).⁹⁷ This would suggest that the requirement of NRC services is higher in tribal areas than in non-tribal areas.

Recommendations

- In order to respond to the higher prevalence of SAM, tribal areas should be prioritised over non-tribal areas when establishing new NRCs.
- The number of beds in tribal areas could be increased from the existing 10 bed per NRC. To start with, beds should be increased in NRCs where the BOR is more than/ close to 100%.

⁹⁷As NFHS-4 data on SAM prevalence is not available block wise, SAM prevalence at the district level has been used to estimate the SAM prevalence in tribal and non-tribal areas.

Strengthening of the Follow-Up Mechanism

There is poor compliance with the prescribed three follow-ups. While most of the discharged children come to the NRC for first follow-up, the proportion coming for the second follow-up is lower, and is further reduced for the third follow-up. The main issues confronting mothers to bring their child for the three follow up visits are: unavailability of a convenient mode of transportation; unavailability of the ASHA due to her other engagement; belief that the child is well and does not require follow-up; and opportunity cost for the daily wage work by mothers.

Lack of motivation among ASHAs to ensure three visits.ASHAs feel that the incentive for follow-up i.e. Rs.100 lump sumto accompany the mother for 3 follow-up visits is insufficient as they have to travel 3 times to the NRC. Further, this payment only becomes available after the completion of 3 follow-up visits, which often do not take place as it is difficult to convince the mothers to come for 3 follow-up visits.

There is poor coordination between staff of two involved departments. The AWWs feel that the ASHA is responsible to ensure the follow-up of discharged children and vice versa. There is gap in the line of communication at the district level even within the health departments, as the case information must be transferred between the medical and health wings of the health system. Systematic communication on follow-up visits by field staff of DoHFW and DWCD is not transferred to the relevant authorities.

Recommendations

- Meetings at the sector level and block level should specifically address the subject of status
 of follow-up of discharged children, with attendance from both DoHFW and DWCD. The
 MMR/IMR meeting provides one opportunity as well as the meeting of the District Nutrition
 Committee.
- A weight record of the child on each follow-up visits of the child in the line listing should be maintained. The analysis of this data could yield valuable information on the improvement (or otherwise) of the WHZ status of children once they return to their homes.

Annexure I

QOC indices and Resources indices for each NRC

		Q	uality	of Care	Indice	es		Re	source	es India	ces	
#	NRC	Effectiveness	Efficiency	Equity	Safety	Patient Centeredness	Manpower	Measuring Instruments	Kitchen Equipment	Medicines	Essential Charts for NRCs	Records
1	DHH KALAHANDI											
2	DHH KANDHAMAL											
3	CHC Khandapada											
4	DHH MAYURBHANJ			-			_					
5	DHH NAWARANGPUR											
6	DHH Nuapada			-								
7	DHH Balangir		0. 									
8												
9	DHH Bhadrak											
10	SDH Bhanjanagar											
11	CHC Bheden		0. 									
12	SDH BONEIGARH											
13	DHH Boudh	_	1									
14	VSS MC, Burla											
15												
16	DHH DEOGARH					-						
17	SDH Dharamgarh											
18	DHH GAJAPATI											
19	SDH GUNUPUR		N	-		_	E					
20	SDH Hindol											

		0	Quality	of Care	e Indice	es		R	esource	es Indi	ces	
#	NRC	Effectiveness	Efficiency	Equity	Safety	Patient Centeredness	Manpower	Measuring Instruments	Kitchen Equipment	Medicines	Essential Charts for NRCs	Records
21	DHH Jagatsinghpur											
22	CHC Jajpur Road											
23	DHH Jharsuguda											
24	DHH Kamakshyanagar		_			_						
25	SDH KARANJIA											
26	DHH Kendrapada											
27	DHH KEONJHAR		_			_						<u> </u>
28	CHC Khamar					_						
29	CHC Khaprakhole											
30	DHH KORAPUT					_						
31	DHH MALKANGIRI											
32	SDH NILAGIRI											
33	SDH Padampur											
34	CHC Pandripani											
35	CHC Rabanaguda											
36	SDH RAIRANGPUR											
37	DHH RAYAGADA											
38	CHC Sakhigopal											
39	DHH Sambalpur											
40	Sishu Bhawan		_									
41	DHH SUNDERGARH											



* Value of Index denoted by height of bar. All vlaues have a maximum of 10.

Annexure II

Source Data

Indicators (APP)	201	4-15	201	5-16	То	tal
Indicators (APR)	n	%	n	%	N	%
Admissions						
Total	5953	-	6765	-	12718	-
Male	2754	46.3	3172	46.9	5926	46.6
Female	3199	53.7	3593	53.1	6792	53.4
SC	1259	21.1	1430	21.1	2689	21.1
ST	3320	55.8	3766	55.7	7086	55.7
Children 0-5 months	680	11.4	803	11.9	1483	11.7
Children 6-23 months	3832	64.4	4068	60.1	7900	62.1
Children 24-59 months	1441	24.2	1894	28.0	3335	26.2
Bed Occupancy Rate	-	56.6	-	61.4	-	-
Transfers	540	9.1	490	7.2	1030	8.1
Exits	5413	-	6275	-	11688	-
Discharged						
Total	4964	86.7	5609	89.4	10303	88.2
In Tribal NRCs	2263	88.4	2713	90.3	4976	89.5
In Non-tribal NRCs	2431	85.2	2788	90.4	5219	87.9
Average Length of Stay						
Average (days)	-	15.0	-	15.0	-	-
In Tribal NRCs	-	15.3	-	14.8	-	-
In Non-tribal NRCs	-	13.7	-	14.1	-	-
Discharged Recovered						
Total	4291	79.3	5142	81.9	9433	80.7
In Tribal NRCs	2136	83.5	2525	84.1	4661	83.8
In Non-tribal NRCs	2155	75.5	2516	81.6	4671	78.6
Discharged Unrecovered						
Total	403	7.4	467	7.4	870	7.4
In Tribal NRCs	127	5.0	188	6.3	315	5.7
In Non-tribal NRCs	276	9.7	272	8.8	548	9.2
Defaulters						
Total	706	13.0	662	10.5	1368	11.7
In Tribal NRCs	291	11.4	287	9.6	578	10.4
In Non-tribal NRCs	415	14.5	296	9.6	711	12.0
Deaths	13	0.2	4	0.1	17	0.1

Indiantora (MDD)	2014	4-15	201	5-16	To	tal
	n	%	n	%	N	%
Incidence of Oedema	29	2.0	34	2.1	-	-
Area of Origin						
Same block as NRC	493	33.6	531	32.2	1024	32.8
Neighbouring block	640	43.6	790	47.9	1430	45.9
Other blocks	274	18.7	273	16.5	547	17.5
Other districts	61	4.2	56	3.4	117	3.8
Area of Origin in Tribal NRCs						
Same block as NRC	147	22.4	177	24.7	324	23.6
Neighbouring block	265	40.5	294	40.9	559	40.7
Other blocks	242	36.9	239	33.3	481	35.0
Other districts	1	0.2	8	1.1	9	0.7
Area of Origin in Non-tribal NRCs						
Same block as NRC	346	42.6	354	38.0	700	40.1
Neighbouring block	375	46.1	496	53.2	871	49.9
Other blocks	32	3.9	34	3.6	66	3.8
Other districts	60	7.4	48	5.2	108	6.2
-4SD SAM cases	632	43.0	637	38.5	1269	40.6
Source of referral						
Frontline workers	555	37.7	575	34.8	1130	46.6
Medical Officer	278	18.9	490	29.6	768	24.6
Pushtikar Diwas	234	15.9	12	0.7	246	7.9
Others	124	8.4	342	20.7	466	14.9
Average weight gain per day (g/kg body weight)						
Male	-	8.9	-	9.8	-	9.4
Female	-	9.7	-	9.8	-	9.7
In Tribal NRCs	-	7.5	-	8.8	-	8.2
In Non-tribal NRCs	-	10.9	-	10.6	-	10.7
Discharged Recovered	-	11.0	-	11.4	-	11.2
Discharged Unrecovered	-	9.2	-	9.1	-	9.1

Indicators (QAT-CU)	n	%
Source of information about NRC		
Frontline Workers	478	80.2
Paediatric Ward	26	4.4
Others	80	15.4
If treatment of SAM child was sought elsewhere, apart from the NRC		
Yes	159	51.8
No	148	48.2
Other facilities where treatment of SAM child was sought		
Government hospital	115	72.3
Private hospital/clinic	21	13.2
Jharphuk/ Vaidya	35	22.0
Others	6	3.8
Use of Jharphuk/ Vaidya as an alternative to treatment in NRCs		
In Tribal NRCs	16	45.7
In Non-tribal NRCs	19	54.3
Time taken to admit SAM child at NRC after identification		
On the same day	145	47.1
Within next few days	81	26.3
After one week	25	8.1
After 15 days	27	8.8
After one month	30	9.7
Barriers to coming to NRC for treatment		
No Barrier	180	47.7
Lack of time	38	10.1
Loss of income	40	10.6
Other siblings to take care of	57	15.1
NRC located too far	4	1.1
No faith in government facility	3	0.8

Cook-cum-Attendant In Position ო ო ოო ო ო ო С 2 с ო **~** ო ო Э с c ~ ო ო ო ო ო ო ო ო ო ო **Irained** 4 4 ო ო 4 2 4 4 က \sim 4 4 4 4 4 4 4 4 4 2 ~ **~** <u>_</u> **~ ~** -. 4 ANM In Position 4 4 4 ო 4 ო ო 4 4 4 4 4 2 <u>_</u> 4 с 2 . <u>_</u> 4 ~ 4 **~** . 4 4 4 4 Trained **~** 0 0 <u>_</u> <u>_</u> <u>_</u> **~** <u>_</u> **~** . **~** . <u>_</u> <u>_</u> <u>_</u> <u>_</u> **~** <u>_</u> Counsellor In Position 0 Medical Officer/Paediatrician Trained 0 ~ 0 <u>_</u> **~** 0 0 **~** ~ 0 0 **~** <u>_</u> <u>_</u> **--**<u>_</u> ~ <u>_</u> <u>_</u> <u>_</u> <u>_</u> In Position **~** . . **~ ~** . 0 . **~ ~ ~ ~** ~ **~ ~ ~ ~ ~** DHH NAWARANGPUR SDH Kamakshyanagar DHH SUNDERGARH DHH MAYURBHANJ SDH RAIRANGPUR DHH KANDHAMAL DHH MALKANGIRI CHC Khaprakhole DHH KALAHANDI SDH Dharamgarh DHH Kendrapada DHH Jharsuguda CHC Jajpur Road DHH Sambalpur SDH BALIGUDA SDH KARANJIA SDH GUNUPUR DHH DEOGARH SDH CHAMPUA **CHC** Pandripani DHH KORAPUT DHH GAJAPATI CHC Umerkote DHH Nuapada SDH NILAGIRI DHH Bhadrak **CHC Khamar NRC Name** SDH Hindol

Manpower (QoC Checklist)

	Medical Officer	/Paediatrician	Couns	sellor	AN	Σ	Cook-cum-Attendant
	In Position	Trained	In Position	Trained	In Position	Trained	In Position
DHH Boudh	-	-	0	0	ო	ო	ç
DHH Jagatsinghpur	~	0	~	-	4	-	ę
SDH BONEIGARH	~	-	0	0	4	4	ę
SDH Bhanjanagar	-	-	-	-	-	-	ę
CHC Sakhigopal	-	0	-	-	4	4	ĸ
CHC Ullunda	-	-	-	-	ო	ო	с
VSS MC, Burla	-	-	-	-	4	4	ę
CHC Bheden	-	-	-	-	ო	ო	ĸ
SDH Padampur	-	-	-	-	ო	ო	с
DHH KEONJHAR	-	0	-	0	ო	ო	ę
CHC Khandapada	-	-	. 	-	4	4	ო
DHH Balangir	-	0	-	-	ო	ო	m
CHC Rabanaguda	-	-	-	-	က	ო	ç
Sishu Bhawan	-	0	-	-	4	4	с
DHH RAYAGADA	~	-	-	-	ო	ო	ç
DHH Nayagarh	-	-	0	0	4	4	S
CHC Saintala	-	-	۲-	-	1	-	ç
DHH Balasore	-	0	-	-	4	2	З

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Q _o C
Instruments (
Measuring

NPC Name	Digital	Watch	Infanto	meter	Stadic	ometer	MUA	C Tape	Gluco	meter	Thermo	meter
	Available	Functional										
DHH KALAHANDI	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH MAYURBHANJ	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH NAWARANGPUR	≻	۲	۲	۲	۲	z	۲	۲	۲	z	۲	۲
DHH KANDHAMAL	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH MALKANGIRI	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	7	≻
SDH Hindol	≻	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲
CHC Pandripani	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	≻	≻
DHH GAJAPATI	≻	≻	≻	≻	۲	z	≻	z	۲	≻	۲	۲
DHH Jharsuguda	≻	≻	≻	≻	≻	z	≻	≻	≻	z	≻	z
DHH Sambalpur	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH Kamakshyanagar	≻	≻	≻	≻	۲	۲	≻	۲	۲	≻	۲	۲
CHC Jajpur Road	≻	≻	≻	≻	۲	۲	۲	۲	۲	≻	۲	۲
DHH Kendrapada	≻	≻	≻	≻	≻	z	≻	≻	≻	≻	≻	≻
DHH KORAPUT	≻	≻	≻	≻	z	na	≻	≻	≻	≻	۲	7
SDH RAIRANGPUR	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲
CHC Umerkote	≻	≻	≻	≻	۲	≻	≻	≻	≻	≻	≻	۲
CHC Khaprakhole	۲	۲	۲	۲	z	na	۲	۲	z	na	۲	۲
DHH Nuapada	≻	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲
DHH DEOGARH	≻	≻	≻	≻	۲	۲	≻	۲	۲	≻	۲	۲
SDH Dharamgarh	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH BALIGUDA	۲	۲	۲	۲	z	na	۲	۲	۲	۲	۲	٢
SDH KARANJIA	≻	≻	≻	≻	≻	۲	۲	≻	≻	≻	۲	۲
DHH SUNDERGARH	≻	≻	≻	≻	۲	۲	۲	≻	۲	≻	۲	۲
SDH NILAGIRI	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH Bhadrak	≻	۲	۲	۲	Y	۲	۲	۲	۲	۲	۲	۲
SDH CHAMPUA	≻	۲	≻	۲	z	na	۲	≻	۲	z	z	na
SDH GUNUPUR	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Khamar	≻	≻	≻	z	≻	z	≻	≻	≻	≻	≻	≻
DHH Boudh	≻	۲	≻	۲	۲	z	۲	۲	۲	z	۲	۲
DHH Jagatsinghpur	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻

	Digital	l Watch	Infanto	ometer	Stadio	ometer	MUA	C Tape	Gluco	meter	Therm	ometer
	Available	Functional										
SDH BONEIGARH	≻	≻	≻	z	≻	z	≻	≻	≻	≻	≻	≻
SDH Bhanjanagar	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Sakhigopal	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Ullunda	≻	≻	≻	≻	≻	z	≻	≻	≻	≻	≻	≻
VSS MC, Burla	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Bheden	≻	z	z	na	≻	≻	≻	≻	≻	≻	≻	≻
SDH Padampur	≻	≻	z	na	≻	۲	≻	≻	≻	≻	≻	≻
DHH KEONJHAR	≻	≻	≻	۲	≻	۲	≻	≻	≻	≻	≻	≻
CHC Khandapada	≻	۲	۲	۲	۲	۲	≻	۲	۲	۲	≻	≻
DHH Balangir	۲	z	۲	۲	۲	۲	۲	۲	z	na	۲	۲
CHC Rabanaguda	≻	≻	≻	≻	≻	z	≻	≻	≻	≻	≻	≻
Sishu Bhawan	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH RAYAGADA	≻	≻	≻	≻	z	na	≻	≻	≻	≻	≻	≻
DHH Nayagarh	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲
CHC Saintala	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	na
DHH Balasore	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	≻

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Equi	
Kitchen	

NRC Name	3 9 9	king as	Die Sc	tary ale	Meas	suring ar	Measi Spo	uring oon	Ele. Blei	ctric nder	Fil	ter ter	Refriç	gerator	Ute	nsils
	Available	Functional	Available	Functional	Available	Functional	Available	Functional	Available	Functional	Available	Functional	Available	Functional	Available	Functional
DHH KALAHANDI	≻	≻	≻	≻	≻	≻	z	na	z	na	≻	≻	≻	≻	≻	≻
DHH MAYURBHANJ	≻	≻	≻	≻	۲	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH NAWARANGPUR	≻	≻	≻	ı	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH KANDHAMAL	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH MALKANGIRI	≻	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH Hindol	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Pandripani	≻	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH GAJAPATI	≻	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	z	≻	z	≻	≻
DHH Jharsuguda	≻	≻	≻	z	≻	≻	z	na	≻	≻	z	na	≻	≻	≻	≻
DHH Sambalpur	≻	≻	≻	≻	≻	≻	z	na	≻	≻	≻	≻	≻	≻	≻	≻
SDH Kamakshyanagar	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Jajpur Road	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH Kendrapada	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH KORAPUT	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH RAIRANGPUR	۲	≻	۲	¥	Y	۲	¥	۲	Y	Y	Y	Y	۲	≻	۲	Y
CHC Umerkote	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Khaprakhole	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH Nuapada	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	≻	≻	≻	≻
DHH DEOGARH	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH Dharamgarh	≻	≻	≻	≻	≻	≻	z	na	z	na	≻	≻	≻	≻	≻	≻
SDH BALIGUDA	۲	≻	≻	۲	Y	۲	¥	۲	۲	۲	۲	۲	۲	≻	۲	۲
SDH KARANJIA	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
DHH SUNDERGARH	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH NILAGIRI	۲	≻	۲	۲	Y	۲	¥	۲	Y	۲	۲	۲	۲	≻	۲	Y
DHH Bhadrak	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH CHAMPUA	۲	≻	≻	۲	۲	۲	z	na	z	na	۲	۲	۲	≻	۲	۲
SDH GUNUPUR	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Khamar	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻

Refrigerator	Available Functional Available Functional	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۰ ۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	۲ ۲	
iter ter	Functional	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	na	≻	na	≻	≻	
Fil	Available	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	≻	z	≻	≻	
ctric nder	Functional	≻	≻	≻	≻	≻	≻	≻	≻	na	na	≻	na	≻	z	≻	≻	
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uring ar	Functional	≻	≻	na	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	
Meas J _i	Available	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	
tary ale	Functional	≻	≻	na	z	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	na	≻	
Die Sc	Available	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	≻	
king as	Functional	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	
0 C C C	Available	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	
NRC Name		DHH Boudh	DHH Jagatsinghpur	SDH BONEIGARH	SDH Bhanjanagar	CHC Sakhigopal	CHC Ullunda	VSS MC, Burla	CHC Bheden	SDH Padampur	DHH KEONJHAR	CHC Khandapada	DHH Balangir	CHC Rabanaguda	Sishu Bhawan	DHH RAYAGADA	DHH Nayagarh	
Checklist)																		
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Medicines																		

Zinc Tablet	۲	≻	≻	≻	≻	۲	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲	≻	7	≻	≻	۲	≻	≻	۲	۲	≻	۲	۲	≻
Vitamin A	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
Folic Acid	۲	≻	≻	≻	≻	۲	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲	≻	≻	≻	≻	≻	≻	≻	۲	۲	≻	۲	۲	≻
Multivitamin	Y	۲	7	7	۲	٢	۲	z	۲	۲	۲	۲	۲	7	۲	٢	۲	7	۲	۲	۲	۲	۲	٢	Y	۲	٢	۲	۶
Iron Syrup	۲	≻	≻	≻	≻	Y	≻	≻	≻	≻	≻	≻	≻	≻	≻	٢	≻	≻	≻	≻	≻	≻	≻	۲	Y	≻	۲	۲	≻
MS Ampules	Y	۲	۲	۲	۲	٢	۲	۲	۲	۲	۲	۲	۲	۲	۲	٢	۲	۲	۲	۲	۲	۲	۲	٢	Y	۲	٢	¥	۲
PC Syrup	Y	۲	≻	≻	۲	Y	۲	z	۲	۲	۲	۲	۲	≻	۲	٢	۲	≻	۲	۲	≻	۲	۲	٢	Y	≻	z	Y	≻
ORS	Y	≻	≻	≻	≻	Y	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲	≻	≻	≻	≻	≻	≻	≻	≻	۲	≻	≻	۲	≻
Eye Drop	۲	≻	≻	≻	z	Y	z	≻	≻	≻	≻	≻	۲	≻	۲	۲	۲	≻	≻	z	≻	۲	۲	z	۲	≻	۲	۲	≻
Albendazole	Y	۲	۲	۲	۲	Y	۲	۲	۲	۲	۲	۲	۲	≻	۲	Y	۲	≻	۲	۲	۲	۲	۲	۲	Y	۲	¥	¥	۲
Cefotaxime	۲	۲	≻	≻	۲	۲	۲	۲	۲	۲	≻	z	≻	≻	۲	۲	۲	≻	≻	z	≻	≻	z	۲	٢	≻	۲	۲	≻
Ampicilin	۲	≻	≻	≻	≻	٢	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲	≻	≻	≻	≻	≻	≻	≻	۲	٢	≻	۲	۲	≻
NRC Name	DHH KALAHANDI	DHH MAYURBHANJ	DHH NAWARANGPUR	DHH KANDHAMAL	DHH MALKANGIRI	SDH Hindol	CHC Pandripani	DHH GAJAPATI	DHH Jharsuguda	DHH Sambalpur	SDH Kamakshyanagar	CHC Jajpur Road	DHH Kendrapada	DHH KORAPUT	SDH RAIRANGPUR	CHC Umerkote	CHC Khaprakhole	DHH Nuapada	DHH DEOGARH	SDH Dharamgarh	SDH BALIGUDA	SDH KARANJIA	DHH SUNDERGARH	SDH NILAGIRI	DHH Bhadrak	SDH CHAMPUA	SDH GUNUPUR	CHC Khamar	DHH Boudh

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Vitam A	≻	~	~	~	~	~	≻	≻	~	~	~	~	~	≻	~	≻	≻
Folic Acid	۲	≻	۲	۲	۲	۲	۲	≻	≻	۲	۲	۲	۲	≻	≻	≻	z
Multivitamin	۲	7	≻	≻	≻	≻	۲	7	7	≻	≻	≻	≻	7	7	7	z
Iron Syrup	≻	≻	≻	≻	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	z	≻
MS Ampules	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	≻
PC Syrup	≻	≻	≻	≻	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	≻	z
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Eye Drop	z	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	z
Albendazole	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	z	≻	≻	≻	≻	≻	≻
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Ampicilin	≻	≻	≻	z	≻	≻	z	≻	≻	≻	≻	≻	≻	≻	≻	z	≻
NRC Name	DHH Jagatsinghpur	SDH BONEIGARH	SDH Bhanjanagar	CHC Sakhigopal	CHC Ullunda	VSS MC, Burla	CHC Bheden	SDH Padampur	DHH KEONJHAR	CHC Khandapada	DHH Balangir	CHC Rabanaguda	Sishu Bhawan	DHH RAYAGADA	DHH Nayagarh	CHC Saintala	DHH Balasore

Essential Charts (QoC Checklist)

NRC Name	Ready Reckoner	F-75 & F-100 in Counsellors' Room	F-75 & F-100 in Kitchen	WFL Charts
DHH KALAHANDI	Y	Y	Y	Y
DHH MAYURBHANJ	Y	Y	Y	Y
DHH NAWARANGPUR	Y	Y	Y	Y
DHH KANDHAMAL	Y	Y	Y	Y
DHH MALKANGIRI	Y	Y	Y	Y
SDH Hindol	Y	Ν	Y	Y
CHC Pandripani	Y	Y	Y	Y
DHH GAJAPATI	Y	Y	Y	Y
DHH Jharsuguda	Y	Y	Y	Y
DHH Sambalpur	Y	Ν	N	Y
SDH Kamakshyanagar	Y	Ν	Y	Y
CHC Jajpur Road	Y	Y	Y	Y
DHH Kendrapada	Y	Y	Y	Y
DHH KORAPUT	Y	Y	Y	Y
SDH BAIRANGPUR	Y	Y	Y	Y
CHC Umerkote	Y	Y	Y	Y
CHC Khaprakhole	Y	Y	N	Y
DHH Nuapada	Y	Y	Y	Y
	Y	Y	Y	Y
SDH Dharamgarh	v v	×	N	· · ·
SDH BALIGUDA	v	×	V	Y Y
	۲ ۷	v	r V	r V
	۲ ۷	v	r V	r V
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CHC Khamar	T V	N	ı V	ı V
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DHH lagatsinghpur	T V	· · · · · · · · · · · · · · · · · · ·	1 V	ı v
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SDH Bhanianagar	T V	×	ı V	ı V
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CHC Rhodon	N	v	ı V	ı V
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DHH KEUNJHAR	Y	Ŷ	Y	Y
	Y	Y	Y	Y
	Y	Y	Y	Y
CHC Kabanaguda	Y	Y	Y	Y
Sishu Bhawan	Y	Y	N	Y
	N	Y	Y	Y
DHH Nayagarh	Y	Y	Y	Y
CHC Saintala	Y	Y	Y	Y
DHH Balasore	Y	Y	Y	Y

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NRC Name	Admissior	n Register	Discharg	e Ticket	Follow-Up	Register	Contact	Register	Child 9	Sheet	NRC	Report
	Available	Updated	Available	Updated	Available	Updated	Available	Updated	Available	Updated	Available	Updated
DHH KALAHANDI	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲
DHH MAYURBHANJ	≻	۲	≻	≻	≻	≻	≻	≻	≻	۲	≻	۲
DHH NAWARANGPUR	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	7
DHH KANDHAMAL	≻	۲	≻	≻	≻	≻	≻	z	≻	۲	≻	≻
DHH MALKANGIRI	۲	٢	۲	۲	۲	۲	۲	۲	۲	٢	≻	٢
SDH Hindol	≻	۲	≻	≻	≻	≻	z	z	≻	۲	≻	≻
CHC Pandripani	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	~
DHH GAJAPATI	۲	٢	۲	۲	۲	۲	۲	۲	۲	۲	≻	۲
DHH Jharsuguda	≻	٢	۲	z	۲	۲	۲	۲	۲	۲	≻	۲
DHH Sambalpur	۲	Y	۲	۲	۲	Y	۲	۲	۲	z	۲	Y
SDH Kamakshyanagar	۲	Y	۲	۲	۲	Y	z	z	۲	٢	۲	Y
CHC Jajpur Road	۲	Y	۲	۲	۲	Y	۲	۲	۲	٢	۲	Y
DHH Kendrapada	≻	۲	≻	۲	≻	۲	≻	۲	۲	۲	۲	Y
DHH KORAPUT	≻	۲	۲	۲	۲	٢	≻	۲	۲	۲	≻	٢
SDH RAIRANGPUR	۲	Y	۲	٢	۲	Y	۲	۲	۲	٢	۲	Y
CHC Umerkote	≻	۲	۲	۲	۲	٢	≻	۲	۲	۲	۲	٢
CHC Khaprakhole	۲	Y	z	z	۲	Y	۲	۲	۲	٢	۲	Y
DHH Nuapada	≻	۲	۲	۲	۲	٢	۲	۲	۲	۲	۲	٢
DHH DEOGARH	≻	۲	۲	۲	۲	z	۲	۲	۲	≻	۲	٢
SDH Dharamgarh	۲	٢	Y	٢	Y	Y	۲	۲	۲	٢	۲	Y
SDH BALIGUDA	۲	۲	Y	۲	۲	Y	۲	z	۲	۲	۲	۲
SDH KARANJIA	۲	۲	۲	۲	۲	٢	۲	۲	۲	۲	۲	٢
DHH SUNDERGARH	۲	۲	۲	۲	Y	٢	۲	۲	۲	۲	۲	٢
SDH NILAGIRI	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲
DHH Bhadrak	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲
SDH CHAMPUA	۲	۲	۲	۲	٢	٢	۲	۲	۲	۲	۲	٢
SDH GUNUPUR	≻	≻	≻	≻	≻	z	≻	z	≻	≻	≻	۲
CHC Khamar	≻	≻	≻	≻	≻	≻	z	z	≻	≻	≻	۲
DHH Boudh	≻	≻	≻	≻	z	z	≻	≻	≻	≻	≻	≻

	Admissio	n Register	Discharg	e Ticket	Follow-Up	Register	Contact	Register	Child S	Sheet	NRC	Report
	Available	Updated	Available	Updated	Available	Updated	Available	Updated	Available	Updated	Available	Updated
DHH Jagatsinghpur	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻	≻
SDH BONEIGARH	۲	۲	۲	۲	۲	۲	≻	۲	۲	۲	۲	۲
SDH Bhanjanagar	≻	≻	7	≻	≻	≻	≻	≻	≻	≻	≻	≻
CHC Sakhigopal	۲	۲	۲	۲	۲	۲	≻	۲	۲	۲	۲	۲
CHC Ullunda	۲	۲	۲	۲	۲	۲	≻	z	۲	۲	۲	۲
VSS MC, Burla	۲	۲	۲	۲	۲	۲	≻	۲	۲	۲	۲	۲
CHC Bheden	≻	≻	z	па	≻	≻	≻	≻	≻	≻	≻	≻
SDH Padampur	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲	≻	≻
DHH KEONJHAR	۲	۲	۲	۲	۲	۲	≻	z	۲	٢	۲	۲
CHC Khandapada	≻	≻	≻	≻	≻	≻	≻	≻	≻	۲	≻	≻
DHH Balangir	۲	≻	۲	۲	۲	z	≻	۲	۲	٢	۲	۲
CHC Rabanaguda	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲	۲
Sishu Bhawan	≻	≻	≻	۲	≻	≻	≻	z	۲	≻	≻	≻
DHH RAYAGADA	۲	≻	7	≻	≻	۲	≻	≻	≻	۲	۲	۲
DHH Nayagarh	۲	≻	۲	۲	≻	۲	≻	۲	۲	۲	≻	۲
CHC Saintala	≻	≻	۲	۲	≻	≻	≻	≻	۲	≻	≻	≻
DHH Balasore	۲	۲	۲	۲	۲	۲	۲	۲	۲	Y	۲	٢

Annexure III

List of respondents for IDIs and FGDs

Respondents for IDIs

		State Officials						
	Name	Designation						
*	Ms. Arti Abuia	Principal Secretary to Government, Department of Tourism and Culture, Government of Odisha						
		(Formerly, Principal Secretary, Department of Health and Family Welfare, Government of Odisha)						
*	Dr. Binod Kumar Mishra	Director, Department of Health and Family Welfare, Government of Odisha						
*	Mr. Prasanth Kumar Reddy	Director, Department of Women and Child Development, Government of Odisha						
*	Dr. Hemanta Kumar Mishra	Additional Director, Child Health (Office of DHFW), Government of Odisha						
*	Dr. Biswaranjan Padhy	Deputy Director, Nutrition (Office of DHFW), Government of Odisha						
*	Dr. Aditya Mohapatra	Consultant- Paediatric (NHM, Odisha)						
*	Mr. Jagabandhu Bhoi	State Data Manager, SMCS Cell (Office of DHFW), Government of Odisha						

		UNICEF Officials
	Name	Designation
*	Mr. Sourav Bhattacharjee	Nutrition Specialist, UNICEF Odisha
*	Mr. Pran Gopal Das	SAM Consultant, UNICEF Odisha
*	Mr. Priyabrata Das	SNC- CDN, RDC, Northern Division, UNICEF Odisha
*	Mr. Sudip Das	SNC- CDN, RDC, Central Division, UNICEF Odisha
*	Mr. Satyaswar Nayak	SNC- CDN, RDC, Southern Division, UNICEF Odisha

		District Officials	
	Name	Designation	District Name
*	Ms. Poonam Guha	District Collector	Rayagada
*	Mr. Pramod Kumar Dash	District Collector	Balasore
*	Dr. Anand Kumar Padia	Chief District Medical Officer	Rayagada
*	Dr. Bhabani Shankar Pani	Chief District Medical Officer	Balasore
*	Dr. Chandan Murmu	Chief District Medical Officer	Mayurbhanj
*	Dr. Kabindra Prasad Sahu	Chief District Medical Officer	Keonjhar
*	Ms. A Kerketta	District Social Welfare Officer	Balasore
*	Ms. Kusum Mala Mishra	District Social Welfare Officer	Mayurbhanj
*	Mr. Rajswar Patnaik	District Programme Manager	Rayagada
*	Mr. Tri Narayan Rao	District Programme Manager	Balasore
*	Ms. Snehalata Padhy	District Data Manager (NHM)	Rayagada
*	Mr. Puspanjali Mishra	Child Development Project Officer	Gunupur

			N	RC	Staff			
	Name	Designation	NRC Name			Name	Designation	NRC Name
1	Nandika Singh	Counsellor	VSS MC, Burla		13	Ajay Kumar Mahanty	Pediatrician	DHH KEONJHAR
2	Neelam Singh	ANM	VSS MC, Burla		14	Puspanjali Naik	Cook	DHH KEONJHAR
3	Santoshini Swain	Cook	VSS MC, Burla		15	Shrabani Kar	ANM	DHH KEONJHAR
4	Sitansu Kumar Meher	Medical Officer	VSS MC, Burla		16	Sudha Rani Sahoo	Nutritional Counsellor	DHH KEONJHAR
5	Jyotshna Rani Dalai	ANM	SDH GUNUPUR		17	Anita Behera	Cook	SDH NILAGIRI
6	Manula Sahu	Cook	SDH GUNUPUR		18	Archana Nayak	Counsellor	SDH NILAGIRI
7	Nisha Rani Mishra	Nutritional Counsellor	SDH GUNUPUR		19	Purna Chandra Dash	Medical Officer	SDH NILAGIRI
8	Rashmi Ranjan Barik	Paediatric Specialist	SDH GUNUPUR		20	Subhadra Ranjeet	ANM	SDH NILAGIRI
9	Babita Khosala	Cook	CHC Rabanaguda		21	Harishchandra Sahoo	Medical Officer	DHH MAYURBHANJ
10	Rashmi Sahu	Counsellor	CHC Rabanaguda		22	Pratima Das	Cook	DHH MAYURBHANJ
11	Subhrajyoti	Medical Officer	CHC Rabanaguda		23	Sonali Sahoo	Counsellor	DHH MAYURBHANJ
12	Swapana Haldar	ANM	CHC Rabanaguda					

	Moth	ers visiting the NRC f	for	follov	w-up (Follow-up Users)	
	Name	NRC Name			Name	NRC Name
1	Padmini Nath	VSS MC, Burla		7	Koushalya Maharana (1⁵t follow up)	SDH NILAGIRI
2	Purnima Chhuria	VSS MC, Burla		8	Sajani Nayak (2nd follow up)	SDH NILAGIRI
3	Radha Majhi	CHC Rabanaguda		9	Sasmita Singh (1st follow up)	SDH NILAGIRI
4	Tuni Harijan	CHC Rabanaguda		10	Mukta Singh (1st follow up)	DHH MAYURBHANJ
5	Sabitri Munda	DHH KEONJHAR		11	Pratima Bhanj (3rd follow up)	DHH MAYURBHANJ
6	Sarojini Juanga	DHH KEONJHAR				

Mothers of admitted SAM children (Current Users)								
	Name	NRC Name			Name	NRC Name		
1	Basanti Bhoi	VSS MC, Burla		26	Asha Munda	DHH KEONJHAR		
2	Gitanjali Behera	VSS MC, Burla		27	Dasama Birua	DHH KEONJHAR		
3	Kabita Bhoi	VSS MC, Burla		28	Dasama Samad	DHH KEONJHAR		
4	Kausalya Rana	VSS MC, Burla		29	Dasami Munda	DHH KEONJHAR		
5	Soudamini Sahoo	VSS MC, Burla		30	Laxmi Munda	DHH KEONJHAR		
6	Subshini Tanbliya	VSS MC, Burla		31	Manju Munda	DHH KEONJHAR		
7	Sulata Bhoi	VSS MC, Burla		32	Minari Munda	DHH KEONJHAR		
8	Suryakanti Bade	VSS MC, Burla		33	Raibari Munda	DHH KEONJHAR		
9	Anjana Sabara	SDH GUNUPUR		34	Shrabani Munda	DHH KEONJHAR		
10	Jamuna Sabara	SDH GUNUPUR		35	Tulasi Munda	DHH KEONJHAR		
11	Sakuntala Hilaka	SDH GUNUPUR		36	Amita Shaw	SDH NILAGIRI		
12	Soigini Sabara	SDH GUNUPUR		37	Hira Majhi	SDH NILAGIRI		
13	Sumati Gandalaka	SDH GUNUPUR		38	Rania Singh	SDH NILAGIRI		
14	Bimala Balkitia	CHC Rabanaguda		39	Saraswati Singh	SDH NILAGIRI		
15	Dhanamani Dalai	CHC Rabanaguda		40	Bada Singh	DHH MAYURBHANJ		
16	Dhanamati Umrjia	CHC Rabanaguda		41	Chanda Singh	DHH MAYURBHANJ		
17	Kamala Gadba	CHC Rabanaguda		42	Kandri Singh	DHH MAYURBHANJ		
18	Mula Jani	CHC Rabanaguda		43	LaxmiTudu	DHH MAYURBHANJ		
19	Niala Muduli	CHC Rabanaguda		44	Rani Soren	DHH MAYURBHANJ		
20	Padma Muduli	CHC Rabanaguda		45	Rita Murmu	DHH MAYURBHANJ		
21	Raibari Munda	CHC Rabanaguda		46	Sambari Murmu	DHH MAYURBHANJ		
22	Rupali Durua	CHC Rabanaguda		47	Sara Marandi	DHH MAYURBHANJ		
23	Sanai Durua	CHC Rabanaguda		48	Shantilata Biswal	DHH MAYURBHANJ		
24	Sumitra Ghiuria	CHC Rabanaguda		49	Singo Marandi	DHH MAYURBHANJ		
25	Sumitra Ghuiuria	CHC Rabanaguda						

Respondents for FGDs

	Front Line Workers									
	Name	Designation	NRC Name		Name	Designation	NRC Name			
1	Amruti Mahangng	ANM	SDH NILAGIRI	43	Nirmala Mahanta	ASHA	DHH KEONJHAR			
2	Annapurna Rout	ASHA	SDH NILAGIRI	44	Padmini Patra	AWW	DHH KEONJHAR			
3	Kabita Behera	ANM	SDH NILAGIRI	45	Patarani Naik	AWW	DHH KEONJHAR			
4	Kanchan Das	ASHA	SDH NILAGIRI	46	Premalata Sahu	AWW	DHH KEONJHAR			
5	Manorama Das	ANM	SDH NILAGIRI	47	Rebati Naik	AWW	DHH KEONJHAR			
6	Minatimani Patra	ANM	SDH NILAGIRI	48	Rebati Naik	AWW	DHH KEONJHAR			
7	Sabitri Panda	ASHA	SDH NILAGIRI	49	Saraswati Sahu	HW	DHH KEONJHAR			
8	Sailabala Behera	AWW	SDH NILAGIRI	50	Sarita Munda	ASHA	DHH KEONJHAR			
9	Santilata Panigrahi	AWW	SDH NILAGIRI	51	Smitanjali Kar	нw	DHH KEONJHAR			
10	Subasini Mahapatra	AWW	SDH NILAGIRI	52	Sunamani Patra	ASHA	DHH KEONJHAR			
11	Sumati Rout	AWW	SDH NILAGIRI	53	Sunaphula Naik	AWW	DHH KEONJHAR			
12	Basanti Manjari Mohanta	AWW	DHH MAYURBHANJ	54	Ushalata Patra	ASHA	DHH KEONJHAR			
13	Chhabirani Singh	ASHA	DHH MAYURBHANJ	55	Alladin Tadingi	ASHA	CHC Rabanaguda			
14	Kishori Giri	ASHA	DHH MAYURBHANJ	56	Anjali Kanak Prabha Sagar	HW	CHC Rabanaguda			
15	Mamata Lenka	ASHA	DHH MAYURBHANJ	57	Chanda Das	ASHA	CHC Rabanaguda			
16	Pratima Patra	ANM	DHH MAYURBHANJ	58	Geeta Mahakud	HW	CHC Rabanaguda			
17	Subhadra Jena	AWW	DHH MAYURBHANJ	59	Kanchan Lata Mohapatra	AWW	CHC Rabanaguda			
18	Sucheta Mohanty	AWW	DHH MAYURBHANJ	60	Kantamadevi Dora	HW	CHC Rabanaguda			
19	Sumati Mahakud	AWW	DHH MAYURBHANJ	61	Priti Rani Gharami	ASHA	CHC Rabanaguda			
20	Swapna Mukli	ASHA	DHH MAYURBHANJ	62	Prmamani Tadingi	ASHA	CHC Rabanaguda			

Front Line Workers									
	Name	Designation	NRC Name			Name	Designation	NRC Name	
21	Tripti Das	ANM	DHH MAYURBHANJ		63	Puspanjali Bisoi	ASHA	CHC Rabanaguda	
22	Chetana Meswa	AWW	VSS MC, Burla		64	Sabita Halba	AWW	CHC Rabanaguda	
23	Gudia Begum	Multi- Purpose HW	VSS MC, Burla		65	Sashmita Leehman	AWW	CHC Rabanaguda	
24	Jamuna Seth	AWW	VSS MC, Burla		66	Usharani Harijan	ASHA	CHC Rabanaguda	
25	Jayanta Ku Das	Multi- purpose HW	VSS MC, Burla		67	Arati Rout	HW	SDH GUNUPUR	
26	Jhaki Barik	AWW	VSS MC, Burla		68	Basanti Dhoba	AWW	SDH GUNUPUR	
27	Kamini Tripathy	ASHA	VSS MC, Burla		69	Bighnesari Nayak	HW	SDH GUNUPUR	
28	Mamata Chhuria	AWW	VSS MC, Burla		70	Brundabati Sabara	HW	SDH GUNUPUR	
29	Manjula Nayak	AWW	VSS MC, Burla		71	Jambubati Sahoo	HW	SDH GUNUPUR	
30	Padmini Mishra	AWW	VSS MC, Burla		72	Kamala Sabara	ASHA	SDH GUNUPUR	
31	Santoshni Mahakur	ASHA	VSS MC, Burla		73	Kusuma Mutuka	HW	SDH GUNUPUR	
32	Sujata Meher	HW	VSS MC, Burla		74	Laxmi Kanti Rout	Additional ANM	SDH GUNUPUR	
33	Sumita Purohit	Multi- Purpose HW	VSS MC, Burla		75	M Jayati Laxmi	ASHA	SDH GUNUPUR	
34	Susmita Seth	AWW	VSS MC, Burla		76	P. Bimala	AWW	SDH GUNUPUR	
35	Tera Mahananda	AWW	VSS MC, Burla		77	P. Usha	ASHA	SDH GUNUPUR	
36	Udian Kumbhar	ASHA	VSS MC, Burla		78	Puspanjali Pala	AWW	SDH GUNUPUR	
37	Ahalya Sahu	HW	DHH KEONJHAR		79	Rambha Senapati	AWW	SDH GUNUPUR	
38	Aparna Devi	HW	DHH KEONJHAR		80	Ratnamala Sahu	ASHA	SDH GUNUPUR	
39	Bhama Patra	AWW	DHH KEONJHAR		81	Sujata Kumari Patra	HW	SDH GUNUPUR	
40	Kamalini Sendha	AWW	DHH KEONJHAR		82	SunitaToika	ASHA	SDH GUNUPUR	
41	Kuntala Mahanta	HW	DHH KEONJHAR		83	Urmila Ratnaly	AWW	SDH GUNUPUR	
42	Nandi Dei	AWW	DHH KEONJHAR		84	Urmilabala Mohapatra	HW	SDH GUNUPUR	