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# A CROSS-SECTIONAL STUDY TO EVALUATE THE FUNCTIONING AND INFRASTRUCTURE OF MOBILE HEALTH TEAMS AND DEIC (DISTRICT EARLY INTERVENTION CENTRE) AT KORAPUT DISTRICT OF ODISHA UNDER RASTRIYA BAL SWASTHYA KARYAKRAM (RBSK)

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## ABSTRACT

Background: With a child population of over 400 million, India has the largest number of children between the ages of 0-18 years globally. India contributes 20% to global child deaths. Govt. of India introduced several health programmes over years to address country's poor health and survival status Rashitrya Bal Swasthya Karyakram (RBSK) is a newly launched programme under NHM aiming at child health screening, early identification and early intervention for children from birth to 18 years of age to cover 4DS vis. Defects of birth, deficiencies, Diseases, developmental delays including Disabilities, free of cost. Objective: To evaluate the functioning and infrastructure of mobile health teams and DEIC (District Early Intervention Centre) at Koraput District in Odisha under Rashitrya Bal Swasthya Karyakram (RBSK). Materials and Methods: It is a retrospective cross-sectional study for a period of 4 years i.e. form 2014-15 to 2017-18. Different data regarding the activities of MHTs and DEIC were collected from RBSK Manager and Data Entry Operator of DEIC. After compilation of 4 years data, functioning and infrastructure of DEIC was evaluated. Result: DEIC and MHTs under RBSK, Koraput is deficient in both human resources and infrastructure. 87% of 0-18 year children were screened by MHTS out of which 8% of children with 4Ds were referred to DEIC. Out of all referred cases 52% of Birth defects, 43% of developmental Delays including disabilities, were treated and supported by DEIC. 66% of children with various diseases and 70% of children suffering from deficiencies were treated at CHCs by MHTs and also at DEIC. Newborn screening at DPs was 82%. 61% of newborns discharged from SNCU were screened at DEIC. Total achievement of RBSK Programme includes 254 cases of clubfoot correction, 157 cases of clef flip and clef palate repair, 76 cases of congenital cataract surgery, 36 cases of CHD management, distribution of hearing aids to 387 children, distribution of spectacles to 1538 school children with refractory error and referral of 530 SAM children to different NRCs. Conclusion: RBSK Programme provided an effective platform for early screening of 0-18 year children for 4Ds. Deficiency of staffs need to be filled up to make still more effective. Infrastructure should also be strengthened. Referral system should be strengthened for early intervention for congenital heart diseases and NTDs. Capacity building and awareness of health care providers at DPs should be undertaken for screening of birth defects. SNCU staffs need orientation for referring all newborn babies discharged from SNCU to attend DEIC for screening and follow up. Each baby discharged from SNCU should be tracked for regular follow up.

**KEYWORDS:** RBSK, DEIC, 4Ds, Birth Defect, Developmental Delay and Disabilities.

## INTRODUCTION

With a child population of over 400 million, India has the largest number of children between the ages of 0-18 years globally. India contributes 20% to global child death.[1] India's child health indicators continues to be alarming. The Govt. of India has introduced several initiatives and programmes over the years to address the country's poor child health and survival status. Rashtriya Bal Swasthya Karyamram (RBSK) launched in 2013, is a new initiative aiming at child health screening, early identification and early intervention for children from birth to 18 years to cover 4D's viz. defects at birth, deficiencies, Diseases and developmental delays including disabilities.[2] RBSK is one of the unique programmes in the world aimed at early screening of and early intervention for 4Ds among children to minimize disability. It shifts away from survival to healthy survival.[1] It is expected that these services will reach and benefit about 27 crores of children in the age group of 0-18 years.[3]

In India, out of 100 babies born, 6 to 7 have birth defects, with a large birth cohort of almost 26 million per year, India would account for the largest share of birth defects in the world. In Indian context this amounts to 1.7 million birth defects annually and would account for 9.6% of all newborn deaths.[3,4] 64.3 infants per 1000 live births are born annually with birth defects. Of these 7.9 have cardiovascular defects, 4.7 have neural tube defect, 1.2 have some form of haemoglibopathy, 1.6 have down syndrome and 2.4 have G6PD deficiency.[3,4]

Various nutritional deficiencies affecting the preschool children range from 4% to 70%. Evidence also suggests that 48% children <5 years are chronically malnourished. Nearly 47 million of these children i.e. 38.4% are stunted, 35.7% underweight, 21% are wasted, 7.5% children suffer from SAM, anaemia present is estimated to be 58.5% in children below 5 years of age (NHF54, 2015-16).[7,8]

The prevalence of dental carries varies between 50-60% among Indian school children. Rheumatic heart disease is reported at 1.5 per thousand among school children 5-9 years and 0.13 to 1.1 per thousand (10-14 years). The median prevalence of reactive airway disease including asthma in children is reported to be 4.75%.[3]

Globally 200 million children do not reach their developmental potential in the first 5 years of life due to poverty, poor health, nutrition and lack of early stimulation.[5] In India developmental delays are common in early childhood affecting at least 10% of children. Further, SNCU technical reports have reported that approximately 20% of the babies discharged from the health facilities are found to suffer from developmental delays or disabilities at a later stage.[6] These delays if not intervened timely may lead to permanent disabilities with regard to cognition, hearing and vision.

**Health conditions identified for screening[3]**

RBSK programme under NHM envisages to cover 38 identified health conditions for early detection and free treatment and management. This includes 4Ds and Adolescent health problems and congenital hypothyroidism, sickle cell anaemia and beta thalassemia.

**Implementation Mechanism**

The following mechanism is adopted to reach all the target groups of children for health screening.

1. **For Newborn:** Facility based newborn screening at public health facilities by existing health manpower. Community based newborn screening at home through ASHAs for newborns till 6 weeks of age during home visits.
2. **For children 6 weeks to 6 years:** Anganwadi Centre based screening by the dedicated Mobile Health Teams (MHTs).
3. **For children 6 years to 18 years:** Govt and Govt. aided school based screening by dedicated mobile health teams.

**Mobile Health team (MHT)**

The mobile health team consists of 4 members - Two Ayush Doctors (1 male, 1 female), one ANM/ Staff Nurse, one pharmacist with proficiency in computer for data management.

In order to facilitate implementation of the health screening process, vehicles are hired for movement of the MHTs to Anganwadi centres and schools. A tool kit with essential equipment for screening of children is also provide to the MHTs.

**District Early Intervention Centre (DEIC)**

DEICs are established at each of the District headquarters Hospitals. The purpose of DEIC is to provide referral support to children detected with health conditions during health screening.

**Composition of Team at DEIC[3]**

The team consists of one Paediatrician, one medical officer, one dental surgeon, psychotherapist, audiologist and speech therapist, psychologist, optometrist, early interventionist-cum-special educator-cum-social worker, Lab. Technician, dental technician, Manager and data entry operator one each.

**Role of DEIC**

The purpose of DEIC is to provide referral support of children detected with health conditions (4Ds) during health screening. Children and students presumptively diagnosed to have a disease / deficiency / disability / Defect and who require confirmatory tests or further examination will be referred to the designated tertiary level public sector health facilities through the DEIC.

The DEIC would promptly respond to and manage all issues related to developmental delays, hearing defects, vision impairment, neuromotor diseases, speech and languages delay, autism and cognitive impairment. Besides this the team will also be involved in new-born screening at the district level. DEIC has basic facilities to conduct tests for hearing, vision, neurological tests and behaviour assessment. The idea behind child health screening is to detect early and intervene early and minimise disability. Once the disability is already established then the intervention would include enhancement of child development for child to reach the highest potential for the child possible and prevent progression to handicap that may arise from activity limitation. DEIC is established with the aim to have more accessible health facilities with infrastructure and resources for interdisciplinary evaluation and intervention to be delivered under one roof.[9] Mostly, disease and deficiency related cases are managed at CHC and defects at birth and developmental delays are referred to DHH / DEIC for management. All the cases

are treated free of cost. DEIC makes linkage with NPCB, RSBY, BKKY, OSTF and DDRC for management of different referral cases free of cost. If needed RBSK fund is utilized for this purpose.[10]

With this background, the present study was conducted with the aim to evaluate the functioning and infrastructure of DEIC and the achievement under RBSK programme so far and explore the problems and to recommend remedial measures.

## METHODOLOGY

This is a retrospective cross-sectional study conducted in the DEIC of DHH and SLN Medical College Hospital, Koraput, Odisha, India after clearance by the ethical committee. The study duration was 4 yeas form 2014-15 to 2017-18.

Observational checklist according to norms of DEIC was used for assessment of staffing pattern and infrastructure. Data regarding target and achievement of DEIC was collected form DEO and RBSK manager. Data regarding total No. of children screened and the magnitude of 4Ds and the intervention done, was collected. After completion of the study period, analysis of the all data was done.

## RESULTS

**Table 1: Basic Information.**

| | |
|---|---|
| Date of functioning of RBSK Programme in Koraput | 2014-15 |
| Date of functioning of DEIC at DDH, Koraput | 24.04.2015 |
| Total population of Koraput District | 13.8 Lakhs |
| No. of children (0-18 Years) | 435876 |
| Total No. of Blocks | 14 Nos. |
| Total No. of MHTS | 28 |
| Total No. of vehicles hired | 28 |

**Table 2: Staff position of RBSK Programme.**

| Category | Sanctioned | In Position | Vacant |
|---|---|---|---|
| Ayush Medical Officer (M) | 28 | 17 | 11 |
| Ayush Medical Officer (F) | 28 | 9 | 19 |
| A.N.Ms | 28 | 18 | 10 |
| Pharmacist | 28 | 17 | 11 |
| Total | 112 | 61 | 51 |

**Table 3: Staff Position of DEIC, DHH, Koraput.**

| Name of the Post | Sanctioned | In Position | Vacant |
|---|---|---|---|
| Paediatric Specialist | 1 | 0 | 1 |
| Medical Officer (MBBS) | 1 | 0 | 1 |
| Dental Doctor | 1 | 1 | 0 |
| RBSK Manager | 1 | 1 | 0 |
| Physiotherapist | 1 | 1 | 0 |
| Audiologist-cum-Speech Therapist | 1 | 1 | 0 |
| Psychologist | 1 | 1 | 0 |
| Optometrist | 1 | 0 | 1 |
| Dental Technicians | 1 | 0 | 1 |
| EI-cum-Special Educator | 1 | 1 | 0 |
| Social Worker | 1 | 1 | 0 |
| Staff Nurse | 1 | 0 | 1 |
| Laboratory Technicians | 1 | 0 | 1 |
| Data Entry Operator | 1 | 1 | 0 |
| Total | 14 | 8 | 6 |

**Table 4: Equipmetns supplied to each MHT.**

| | |
|---|---|
| 1 | Weighing Machine for both infants and adults |
| 2 | Stadiometer |
| 3 | Infantometer |
| 4 | Head circumference measuring tape |
| 5 | MUAC Tape |
| 6 | Sphygmomanometer |
| 7 | Lap Top |

Other testing materials supplied in the kit - Rattle, red ring, Bell, Torch, Small toy, Two Balls, A dangling object, container with screw on, top paper, crayon / pencil, drinking cap, 1 picture book, blocks, spoons, raising cloth, doll, toy can, small shirt with button, 3 pairs of different coloured crayon, 3 pairs of picture cards, different shape, size and coloured objects, 6 pieces of colour paper, 4 piece, circles and squares, 4-6 piece puzzle, etc.

**1. RBSK Job Aids contents**

1. Screening tool-cum-referral card
2. Pictorial tool for disease, birth defects, and deficiencies and typical and atypical development.
3. Different Registers to be maintained - Growth charts, BMI Chart.

**2. Vision screening tool**

- **Audiology:** Audiometer, OAE, BOA, Tympanometry, ABR Screener, Otoscope & BERA.
- **Physiotherapy:** Therapy balls, Trampoline, Static cycle, Therapy mat, Bean bag & CP chair.
- **Dental Unit:** Dental X-ray.
- **Vision:** Indirect Ophthalmoscope with 20& 30D lens, Streak Retinoscope, Auto Refractometer, Hand held slit lamp.
- **Psychologist:** DASSI, Sanguine Form Board, INCLEAN ADHD assessment tool, (ESSA) Autism assessment tool.

**Table 5: List of Equipment at DEIC.**

| Sl. No. | Name of the Equipment |
|---|---|
| 1 | Ball Pool with multi-colour small Balls |
| 2 | Tunnel |
| 3 | Ramp & step (Plywood) for sensory integration |
| 4 | Chart paper, pencil, gum, crayon, gripper, eraser, scissor, note books, duster, scale, measuring tape, slate, chalk, sharpener, cup & plate, comb, mirror, tooth paste, brush, tongue cleaner, nail cutter, Story book, pillow, Mathematical symbols & numbers etc. |
| 5 | Flash Cards (Alphabets, numbers, colours, shapes, body parts, size, animals and fruits etc.) |
| 6 | Different types of toys and playing materials viz. Ludu, Carom, Bat & Ball, puzzles, blocks |
| 7 | Tube Swing |
| 8 | Activity table (wooden) |
| 9 | Tricycle for baby |
| 10 | Rocking Horse |
| 11 | Walker for baby |
| 12 | Colour LED Bulbs for sensory integration |
| 13 | Swing |
| 14 | Baby Bi-cycle |
| 15 | Money Bank |

**Table 6: Year-wise Performance under RBSK (2014-18).**

| Year | Target children for screening | Children screened | Children referred | No. of children availing higher level of care |
|---|---|---|---|---|
| 2014-15 | 336736 | 222352 (66%) | 28968 (13%) | 0 |
| 2015-16 | 387951 | 291043 (75%) | 41515 (14%) | 134 |
| 2016-17 | 387951 | 310987 (80%) | 35052 (11%) | 127 |
| 2017-18 | 425008 | 368910 (87%) | 29409 (8%) | 180 |

**Table 7: Status of Year-wise management of 4D's at DEIC.**

| Year | Birth defect | Disease | Deficiency | Developmental Delay |
|---|---|---|---|---|
| 2014-15 | 90 | 366 | 43 | 169 |
| 2015-16 | 189 | 828 | 438 | 1069 |
| 2016-17 | 437 | 1379 | 365 | 2236 |
| 2017-18 | 328 | 2159 | 310 | 2252 |
| Total | 1044 | 4732 | 1165 | 5726 |

**Table 8: Status of Birth defect Management (from 2014-15 to 2017-18).**

| Birth Defect | Total No. Detected | Total No. Treated | Outcome |
|---|---|---|---|
| Neural Tube Defect | 84 | 5 | 5.9% |
| Cleft lip, cleft palate | 260 | 157 | 60% |
| Club Foot | 428 | 254 | 59.3% |
| Developmental Dysplasia of hip | 143 | 44 | 30.7% |
| Congenital Heart Disease | 131 | 28 | 21.3% |
| Down Syndrome | 132 | 93 | 70.4% |
| Congenital Cataract | 267 | 76 | 28.4% |
| Congenital Deafness | 744 | 387 | 52% |
| Retinopathy of Prematurity | 0 | 0 | 0% |
| Total | 2207 | 1044 | 47% |

**Table 9: Status of Developmental Delay & Disabilities Management.**

| Developmental Delay & Disabilities | No. of children Identified | No. of Children Treated | Outcome |
|---|---|---|---|
| Vision Impairment | 6632 | 1587 | 23% |
| Hearing Impairment | 1173 | 750 | 63.9% |
| Neuromotor Impairment | 501 | 476 | 95% |
| Motor Delay | 456 | 171 | 37.5% |
| Cognitive Delay | 554 | 554 | 100% |
| Language Delay | 1348 | 1165 | 86.4% |
| Behaviour Disorder (Autism) | 272 | 94 | 34.5% |
| Learning Disorder | 512 | 31 | 6% |
| ADHD | 186 | 186 | 100% |
| Total | 11634 | 5014 | 43% |

**Table 10: Diseases Identified and Managed by RBSK.**

| Disease | No. of identified | Service Provided | |
|---|---|---|---|
| | | No. | Percentage |
| Skin conditions | 59165 | 47871 | 80.9% |
| Otitis Media | 8887 | 7838 | 88.1% |
| Rheumatic Heart Disease | 139 | 2 | 1.4% |
| Reactive Airway Disease | 77503 | 59446 | 76.7% |
| Dental Condition | 83737 | 35423 | 42.3% |
| Convulsive Disorder | 930 | 615 | 66.1% |
| Total | 230361 | 151195 | 65.6% |

**Table 11: Deficiencies Identified and Managed.**

| Deficiency | No. of identified | Service Provided | |
|---|---|---|---|
| | | No. | Percentage |
| Severe Anaemia | 2660 | 1602 | 60.2% |
| Vit. A deficiency | 2505 | 2129 | 84.9% |
| Vit. D deficiency | 689 | 465 | 67.4% |
| SAM | 4603 | 3164 | 68.7% |
| Goitre | 112 | 37 | 33.0% |
| Total | 10569 | 7397 | 69.98% |

**Table 12: Empanelled Hospitals for Tertiary Care.**

| | |
|---|---|
| 1. | Apollo Hospital for Heart Surgery |
| 2. | Narayan Hrudalaya, NIMH Bangalore & Howrah for Heart Surgery |
| 3. | SBM Hostial, Plastic Surgery Department, Cuttack for cleft lip and cleft palate |
| 4. | SVNIRTAR, Olatpur, Cuttack for club foot |
| 5. | LVPEI, Bhubaneswar for eye cases |
| 6. | AIIMS, Bhubaneswar |
| 7. | All Govt. Medical Colleges, Odisha |

**Table 13: Newborn Screening at delivery Points for Birth Defects.**

| Year | No. of Live Births | No. of Babies Screened at DP | Percentage |
|---|---|---|---|
| 2014-15 | 28373 | 1755 | 06 |
| 2015-16 | 27196 | 10376 | 38 |
| 2016-17 | 24948 | 17082 | 68 |
| 2017-18 | 24106 | 19712 | 82 |

**Table 14: Achievement of RBSK, Koraput (2014-15 to 2017-18).**

| Sl. No. | Particulars of Treatment | Achievement |
|---|---|---|
| 1. | No. of club foot surgery | 254 |
| 2. | No. of cleft lip and Palate surgery | 157 |
| 3. | Distribution of Hearing Aids | 387 |
| 4. | CHD Medical & Surgical treatment | 36 |
| 5. | Congenital cataract surgery and other eye cases managed | 235 |
| 6. | Refractory Errors managed | 2171 |
| 7. | Distribution of Spectacles | 1538 |
| 8. | No. of tertiary level referrals | 436 |
| 9. | SAM cases referred by RBSK to NRCs | 530 |
| 10. | 4D cases identified and initiated therapy by DEIC staff | 3576 |

**Table 15: Prevalence Rate of Congenital Defects under RBSK Koraput from 2014-15 to 2017-18.**

| 4D | Name of the Health Condition | Prevalence (followed form RBSK Resource material) | Total No. of children screened | Total No. of cases confirmed and Line listed | Prevalence per 1000 live Birth |
|---|---|---|---|---|---|
| Birth defect | Neural tube condition | 4.2 per 1000 live births | 104623 | 84 | 0.80 |
| | Down's Syndrome | 1.09 per 1000 live births | 104623 | 132 | 1.26 |
| | Cleft Lip & Palate | 0.93 for every 1000 live births | 104623 | 260 | 2.49 |
| | Club Foot | 1-2 per 1000 live birth | 104623 | 428 | 4.09 |
| | Developmental dysplasia of the hip | 1 in 1000 children birth | 104623 | 148 | 1.37 |
| | Congenital cataract | 1-1.5/10,000 children | 104623 | 76 | 0.73 |
| | Congenital deafness | 5.6 to 10/1000 live births | 104623 | 744 | 3.70 |
| | Congenital heart diseases | 8-10/1000 live births | 104623 | 131 | 1.25 |
| | Retinopathy of Prematurity | 20-22% of premature children | | -- | -- |

## RESULT

RBSK programme was launched in Koraput during 2014-15 and the District Early Intervention Centre (DEIC) started functioning since 24.04.2015. Koraput district has a population of 13.8 Lakhs and 14 Blocks with 28 MHTs (Mobile Health Teams), with 5,42,794 numbers of 0-18 years children. 28 numbers of vehicles are hired for the 28 MHTs (Table-1). There were 17 male Ayush Doctors, 9 female Ayush doctors, 18 ANMs and 17 Pharmacists (against a sanctioned strength of 28 each). Total human resource is 61 against sanctioned 112 pots (54%) for MHTs (Table-2). DEIC functioned with 1 Dental doctor, 1 RBSK Manager, 1 Physiotherapist, 1 Audiologist, 1 Psychologist, 1 Physical Educator, 1 Social Worker and 1 Data Entry Operator, Post of Pediatric Specialist, Medical Officer, Optometrist, Dental Technician, Staff Nurse and Dental Technician was laying vacant. So, there is constraint of human resource at DEIC i.e. 8 against sanctioned 14 posts (57%) (Table-3). All the equipment are supplied to all MHTs as per the norms of RBSk programme for screening of 4Ds in children 0-18 years (Table-4). Also, almost all the equipment needed for DEIC was supplied as per RBSK guidelines (Table-5). Target children for screening was fixed as per the availability of MHT teams and vehicles. In 2014-15, 222352 (66%) children were screened against a target of 336736, of which 28968 (13%) children were referred to DEIC and no child could be referred for tertiary care. Screening and referral gradually increased from 66% in 2014-15 to 75% in 2015-16, 80% in 2016-17 and 87% in 2017-18. Number of children availing higher level of tertiary care was 134 in 2015-16, 127 in 2016-17 and 180 in 2017-18 (Table-6). Total number of 4Ds treated at DEIC were 1044 birth defects, 4732 diseases, 1165 deficiencies and 5726 developmental delay cases (Table-7). Out of total 1998 Birth defects 1044 cases (52%) are treated, while other 954 (48%) cases are line listed for treatment after wards (Table-8). Out of 11634 cases of different types of developmental delays and disabilities, 5014 (43%) cases were treated at DEIC while others are line listed for treatment (Table-9). Out of 230361 children suffering from different types of diseases, 151195 (66%) children were successfully treated at CHCs by RBSK MHT teams (Table-10). Out of 10569 children identified with various deficiencies, 7397 (70%) were treated by MHTs

(Table-11). Out of all cases referred to DEIC by MHTs, 436 cases were referred to different tertiary care hospitals empanelled for RBSK programme by Govt. of Odisha (Table-12). Newborn screening at delivery points also done by different health care provides at DPs. Percentage of newborn babies screened at delivery points gradually increased form 6% in 2014-15 to 38% in 2015-16, 68% in 2016-17 and 82% in 2017-18 (Table-13). During 2017-18, 1398 babies were cured and discharged from SNCU, Koraput, out of which only 848 (61%) newborns were screened at DEIC. Achievement of RBSK programme in Koraput till 2017-18 since the functioning (2014-15) includes 254 cases of club foot correction, 157 cases of cleft lip and palate repair, 76 cases of congenital cataract surgery, 36 cases of congenital heart disease management, distribution of hearing aids to 387 children, distribution of spectacles to 1538 school students with refractory error and referral of 530 SAM children to different NRCs of the District (Table 14).

## DISCUSSION

RBSK programme is a new imitative of GOI aiming at child health screening, early identification and early intervention for children from birth till 18 years of age. DEIC established at District Headquarters acts as an effective platform for management of referred cases free of cost. With limited human resource of 54% of MHTs and 57% at DEIC, the staff tried to render maximum possible service to the 0-18 years child population of 4,34,169. Among all children screened by MHTs, 13% of children in 2014-15, 14% in 2015-16, 11% in 2016-17 and 8% in 2017-18, were referred to DEIC. In other study done by Parmar et al, percentage of referral to DEIC was 5.2% in Indore and 6.015 in Ujjain. No. of 4Ds identified by MHTs and DEIC were, birth defects 1998 (0.5%). Developmental Delay and disabilities 11634 (2.4%), diseases 230361 (52%) and various deficiencies - 10569 (2.4%). Prevalence rate of different congenital defects per 1000 live births in this study was NTD (0.8%), cleft lip and cleft palate (2.49), club foot (4.09), DDH (1.37), congenital cataract (0.73), congenital deafness (3.7), congenital heart disease (1.25) and down syndrome (1.26). As per March of Dimes, Global Report on Birth defects and RBSK Resource Manual, these figures are 4.2, 0.93, 1-2, 1, 1-1.25, 5.6, 8-10 and 1.09 respectively (Table 15). Out of all referred children with birth defects, 525 of children were supported and managed by DEIC, whereas it was only 2.51% in Indore and 8.25% in Ujjain DEIC.

Out of all referred children with developmental delay and disabilities 43% of them were supported and managed by DEIC, whereas it was only 0.89% in Indore and 2.625 in DEIC Ujjain. 66% of children suffering from various diseases (Table-10) and 70% children suffering from different deficiencies (Table-11) were managed by MHTs and DEIC. In case of SAM, out of all detected cases, 3164 (68.7%) children were managed in community and 530 (11.5%) cases of SAM with complication were referred to NRCs.

Newborn screening at DPs gradually improved from 6% in 2014-15 upto 82% in 2017-18. Percentage of screening of SNCU graduate newborns during 2017-18 is only 61%.

## CONCLUSION

RBSK Programme provided an effective platform for early screening of 0-18 year children for various health problems by MHTs and a good referral support and management by staff of DEIC to children identified and referred to them. There was a deficiency of staff both of MHTs and DEIC. These need to be filled up to make still more effective implementation of the programme. Retinopathy of prematurity could not be screened due to non-availability of trained optometrist / ophthalmologist. Screening for sickle cell disease and thalassemia could not be done due to non-availability of blood testing facility for Hb electrophoresis. These gaps should be filled up for a better outcome of the programme. Referral services to tertiary care centers should be more streamlined and accelerated for an early intervention especially for congenital heart diseases and NTDs. Newborn screening at delivery points and referral of SNCU graduate babies to DEIC need further strengthening and capacity building of healthcare provides. Each baby discharged form SNCU should be line listed and tracked in the community for regular follow up for an early screening of health conditions and early intervention for an effective outcome. This tracking can be done through available health care facilities i.e. AWW, ASHA, Health Worker, MCTS (mother and child tracking system) and through SMS in mobile phones.

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