PUBLIC HEALTH FOUNDATION OF INDIA

An evaluation of Special Care Newborn Units in eight districts in India

Working towards a healthier India

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Public Health Foundation of India (PHFI)
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List of abbre-viations

ADM	Additional District Magistrate
ADMO	Additional District Medical Officer
AIIMS	All India Institute of Medical Science
ALOS	Average Length of Stay
AMC	Annual Maintenance Contract
AMCH	Assam Medical College and Hospital
ANC	Antenatal Checkup
ANM	Auxillary Nursing Midwife
ASHA	Accredited Social health Activist
AWW	Anganwadi Worker
BP	Blood pressure
BPHC	Block Primary Health Centre
BPL	Below Poverty Line
C Sec	Caesarean Section
CFR	Case Fatality Rate
CHC	Community Health Centre
CSF	Cerebrospinal Fluid
CSSM	Child Survival and Safe Motherhood
DAMA	Discharge Against Medical Advice
DCH	Diploma in Child Health
DF	Degree of freedom
DOHFW	Department of Health and Family Welfare
DHS	District Health Society
ECMO	Extracorporeal Membrane Oxygenation
EMRI	Emergency Management and Research Institute
FRU	First Referral unit
FU	Follow Up
GNM	General Nursing & Midwifery

GOI	Government of India
JSY	Janani Suraksha Yojna
HRA	House Rent Allowance
ICMR	Indian Council of Medical Research
IEC	Information Education Communication
IIPH	Indian Institute of Public Health
IMNCI	Integrated Management of Neonatal and Childhood Illnesses
IMR	Infant Mortality Rate
IPD	In-Patient Department
IPHS	Indian Public Health Standards
IV	Intravenous
KMC	Kangaroo Mother Care
KV	Kilo Volt
KVA	Kilo Volt Ampere
KW	Kilo Watt
LAMA	Left Against Medical Advice
LBW	Low Birth Weight
MBBS	Bachelor of Medicine Bachelor of Surgery
MCH	Maternal and Child Health
MD	Doctor of Medicine
MDG	Mid Decade Goals
MM	Mili Meter
MO	Medical Officers
MP	Madhya Pradesha
NA	Not Applicable
NICU	Neonatal Intensive Care Unit
NIPI	Norway Indian Partnership Initiative
NMR	Neonatal Mortality Rate
NNF	National Neonatology Forum
NRHM	National Rural Health Mission
NSU	Neonatal Stabilization Unit
OPD	Out Patient Department
PG	Post Graduate
PGI	Post Graduate Institute of Medical Education and Research
PHC	Primary Health Centre

PHFI	Public Health Foundation of India
PM	Per Month
PMR	Proportional Mortality Rate
PNB	Punjab National Bank
RCH	Reproductive and Child Health
RH	Referral Hospital
RMRS	Rajasthan Medical Rural Services
SCNU	Special Care Newborn Unit
SDH	Sub Divisional Hospital
SDM	Sub District Magistrate
SOP	Standard Operating procedure
SNCU	Sick Newborn Care Unit
SNSU	Sick Newborn Stabilization Unit
SSKMH	Seth Sukhlal Karnani Memorial Hospital
U5MR	Under Five Mortality Rate
UNICEF	United Nations Children's Fund
UNOPS	United Nations office for Project Services
UPS	Uninterrupted Power Supply
VLBW	Very Low Birth Weight
WB	West Bengal

Preface

India has made significant progress in achieving an impressive decline in U5MR but unfortunately there has been a slow decline in IMR and even slower decline in NMR with the result that there is going to be a shortfall of 7-10 points in achieving MDG goals. Several attempts to strengthen newborn care have occurred in India to bring the mortality down.

Major causes of neonatal deaths need to be appropriately recognized by the health worker making home visits in case of domiciliary birth and by trained staff in the facility in case of an institutional delivery. In both the scenarios, the neonate needs to be adequately and safely transferred to a health facility in a timely manner and needs inpatient care in a facility. Recent experiences have shown that a rural district hospital can provide high quality newborn care.

In this direction, a Special Care Newborn Unit (SCNU) was envisaged in Purulia, an under developed district in the state of West Bengal, to demonstrate the impact of strengthening of secondary level care. Results, in the form of numbers of lives saved and the estimated reduction in neonatal mortality rate for the whole district, even with a limited number of beds and staff was very encouraging. This model was, therefore, put to scale by the state government in several other districts and by UNICEF in Port Blair, Andaman and Nicobar Islands. A total of 10 SCNUs were set up in different districts in various states.

Situations vary between and within states and there is no single solution to the challenges faced. To scale up a unit, two interlinked processes are required: a systematic, data driven evidence to examine the challenges and a participatory approach to address them. The first step is to assess the situation and create a policy environment conducive to the intervention. The next step is to achieve optimum care of newborns within health system constraints.

Keeping this in mind Indian Institute of Public Health-Delhi, with support from UNICEF, India conducted an assessment of the existing SCNUs in the country in order to understand the effectiveness of the units, the bottlenecks present and challenges faced in terms of smooth functioning of the units.

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This piece of work is a result of significant contribution by many professionals. Indian Institute of Public Health-Delhi (IIPHD), Public Health Foundation of India (PHFI) led the project and was supported by UNICEF, India Country Office.

The report was made possible due to guidance and support of many people. We extend our heartiest thanks to all of them. We are grateful to Dr. Siddharth Ramji, Dr. Neelam Kler and Dr. Sushma Nangia from National Neonatology Forum (NNF), who helped in finalizing the data collection tools used in the study. We are thankful to Solution Exchange, Maternal and Child Health Community, that provided us with a platform to get access to varied experiences from different parts of the country.

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We would like to express our gratitude to all the clients and mothers, who participated in interaction with us during various phases of the project work.

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1. Introduction

1.1 Background

Every year, 4 million newborn babies die in the first month of life, 99% in low and middle income countries.[1] India carries the highest single share of neonatal deaths in the world- around 25-30% of the world wide total. India is home to 20% of global neonatal births and 30% of global neonatal deaths. Within this lies the foremost challenge of preventing the deaths occurring within the first 2 days of life which account for 45% of neonatal deaths[2]. Well organized neonatal healthcare infrastructure and system is central to reduction of neonatal mortality and morbidity. Organization of optimum neonatal health infrastructure is a formidable task and poses multiple challenges like availability of newborn healthcare facilities, adequate skilled manpower, equipment and supplies and clinical practice guidelines. Capacity building of the healthcare staff of these facilities followed by constant supportive supervision and mentoring along with monitoring and evaluation is an onerous task which needs to be in place to ensure their smooth functioning.[3]

India has made significant progress in achieving an impressive decline in U5MR but unfortunately there has been a slow decline in IMR and even slower decline in NMR with the result that there is going to be a shortfall of 7-10 points in achieving MDG goals[4,5]. The ambitious plans to achieve the MDG goals and to improve the standard of care based on Indian Public Health Standards, the opportunity to make quick strides is upon us.

Several attempts to strengthen newborn care have occurred in India, notably essential newborn care in the national child survival and safe motherhood program (CSSM) and subsequent reproductive and child health program (RCH). These programs aim to provide essential newborn care, immunization, appropriate management of diarrhea, appropriate management of acute respiratory infection and vitamin A prophylaxis for children[6]. Under RCH II and current National Rural Health Mission, the focus on newborn care has become central to the child health strategy both at community and facility level. The Janani Suraksha Yojana (JSY) scheme, in particular, is generating a large increase in institutional deliveries. In addition, the emphasis on community based newborn care through Integrated Management of Newborn and Childhood Illness (IMNCI) and home based newborn care by ASHAs will further identify and refer sick newborns to facility for follow-up care. Skilled clinical interventions thus assume importance when it comes to dealing with referred cases from the community and also in responding to neonatal emergencies.

1.2 Strategies to reduce the burden of neonatal deaths

All health care facilities providing care for newborn infants must be able to provide care at birth that includes resuscitation, initiation of breastfeeding, maintaining warmth and prevention of infection and also stabilize sick newborns until transfer to another appropriate facility. The functional capabilities of facilities that provide inpatient care for newborn infants can be classified as under-

- Level I (basic): a hospital nursery organized with the personnel and equipment to perform neonatal resuscitation, evaluate and provide postnatal care of healthy newborn infants, stabilize and provide care for infants born at 35 to 37 weeks' gestation who remain physiologically stable, and stabilize newborn infants born at less than 35 weeks' gestational age or ill until transfer to a facility that can provide the appropriate level of neonatal care.

1. Improving maternal, newborn and child health in the South East Asia region:http://www.searo.who.int/linkfiles/improving_maternal_newborn_and_child_health_inida.pdf.
2. Multi-centric Home based Intervention project of the Indian Council of Medical Research [ICMR annual report 2005-06].
3. Knippenberg R, Lawn JE, Darmstadt GL et al. Systematic scaling up of neonatal care in countries. The Lancet 2005;365:1087-98.

- Level II (specialty): a hospital special care nursery organized with the personnel and equipment to provide care to infants born at more than 32 weeks' gestation and weighing more than 1500 g who have physiologic immaturity such as apnea of prematurity, inability to maintain body temperature, or inability to take oral feedings; who are moderately ill with problems that are expected to resolve rapidly and are not anticipated to need subspecialty services on an urgent basis; or who are convalescing from intensive care. Level II care is subdivided into 2 categories that are differentiated by those that do not (level IIA) or do (level IIB) have the capability to provide mechanical ventilation for brief durations (less than 24 hours) or continuous positive airway pressure.

- Level III (subspecialty): a hospital NICU organized with personnel and equipment to provide continuous life support and comprehensive care for extremely high-risk newborn infants and those with complex and critical illness. Level III is subdivided into 3 levels differentiated by the capability to provide advanced medical and surgical care.

Level IIIA units can provide care for infants with birth weight of more than 1000 g and gestational age of more than 28 weeks. Continuous life support can be provided but is limited to conventional mechanical ventilation.

Level IIIB units can provide comprehensive care for extremely low birth weight infants (1000 g birth weight or less and 28 or less weeks' gestation); advanced respiratory care such as high-frequency ventilation and inhaled nitric oxide; prompt and on-site access to a full range of pediatric medical subspecialists; and advanced imaging with interpretation on an urgent basis, including computed tomography, magnetic resonance imaging, and echocardiography and have pediatric surgical specialists and pediatric anesthesiologists on site or at a closely related institution to perform major surgery. Level IIIC units have the capabilities of a level IIIB NICU and are located within institutions that can provide extracorporeal membrane oxygenation and surgical repair of serious congenital cardiac malformations that require cardiopulmonary bypass[7].

2. Study rationale

Evaluation is viewed as a structured process that creates and synthesizes information intended for stakeholders about a given program or policy. Gathering evidence from a program evaluation entails developing procedures that can be used to collect information that is convincingly related to the issues and questions that are a part of a decision process.

2.1 Facility Based Newborn Care: The Need

As per the global estimates of the year 2007, 40 percent of the estimated 9.2 million deaths of children under five, occurred in the newborn period and two thirds of the infant mortality is contributed to by neonatal deaths[8]. Major causes of neonatal deaths need to appropriately recognized by the health worker making home visits in case of domiciliary birth and by trained staff in the facility in case of an institutional delivery. In both the scenarios, the neonate needs to be adequately and safely transferred to a health facility in a timely manner and needs inpatient care in a facility. The facility in turn needs to be developed in terms of infrastructure and resources and must be functioning effectively. However, neonatal mortality in district and sub-district hospitals remains high - with few facilities having effective ability to provide this essential care. According to global reviews, roughly 15% of newborns require facility based care, hence it is mandatory to plan and provide for required levels of facility based newborn care set ups at different community levels. FRU guidelines define postnatal care and newborn care as a minimum service requirement of a functional FRU, but propose a limited set of equipment to address neonatal resuscitation only. The Indian Public Health Standards for a 101-200 bedded district hospital have more detailed provision for newborn care, but prescribe a

capacity of 2 beds only and a limited set of procedures. Additional direction is needed to increase the scope of national guidelines and standards for facility based newborn care[8].The need is undeniable but must be recognized to be able to make a dent in neonatal morbidity and mortality.

2.2 Relevance of the study

While until recently there has been little evidence or even experience, latest experiences have shown that a rural district hospital can provide high quality newborn care. A Special Care Newborn Unit (SCNU) was envisaged in Purulia, an under developed district in the state of West Bengal, to demonstrate the impact of strengthening of secondary level care.[4] The unit was developed in district hospital in 2003 and was run by relocated staff from within the district. Results, in the form of numbers of lives saved and the estimated reduction in neonatal mortality rate for the whole district, even with a limited number of beds and staff was very encouraging. This model was, therefore, put to scale by the state government in several other districts and by UNICEF in Port Blair, Andaman and Nicobar Islands. A total of 10 SCNUs were set up in different districts in various states. Those are functional since last 2-5 years.

Situations vary between and within states and there is no single solution to the challenges faced. To scale up a unit, two interlinked processes are required: a systematic, data driven evidence to examine the challenges and a participatory approach to address them. The first step is to assess the situation and create a policy environment conducive to the intervention. The next step is to achieve optimum care of newborns within health system constraints. With this background we propose to evaluate the existing SCNUs in the country in order to understand the effectiveness of the units, the bottlenecks present and challenges faced in terms of smooth functioning of the units.

2.3 Effectiveness of the program

SCNU is an attempt by the Government to strengthen the facility based neonatal care. Assessments suggest that clinical system strengthening or community activities alone have little effect - the greates success comes when both are linked[5]. Intensive state level essential newborn care training and operationalization have failed to bring down the Neonatal Mortality Rate (NMR)[6]. Effective reduction in NR needs back up support of state-of art newborn care units in hospitals with a large number of deiveries. It has been estimated that with the existing facilities in the Purulia Model, at least 270 deaths per year could be averted in the district hospital alone which is approximately 8% of the estimated 3464 neonatal deaths per year in the district. This could reduce NMR of the district by 4.3 (from 55.0 to 50.7)[9].

It is envisaged that development of SCNUs in the district hospital would reduce NMR. Though this is the ulimate objective, it may not be visible in a span of 2-3 years. Yet some of the process indicators may show an improvement and the findings can guide us for scaling up.

2.4 Efficiency

In the light of our limited experience in setting up of SCNUs, it is important to consider that health intervention strategies are not meaningful without a mechanism of delivery and both

4. Sen A, Mahalanabis D, Singh AK, Som TK, Bandyopadhyay S. Imapct of a district level newborn care unit on neonatal neonatal mortality rate: 2 year follow up. J Perinatol 2008.
5. Knippenberg R, Lawn JE, Darmstadt GL et al. Systematic scaling up of neonatal care in countries. The Lancet 2005;365:1087-98.
6. Lahiri A, Mallick A. Newborn health: the West Bengal perception. J Neonatol 2005; 19:41-9.
7. American Academy of Pediatrics. Policy Statement. Levels of neonatal care. PEDIATRICS Vol. 114 No. 5 November 2004.
8. Zulfiqar A. Bhutta, The first 28 days of life. www.unicef.org/sowc09/docs/SOWC09-Panel-3.3-EN.pdf. Accessed on 12 September, 2010.
9. Sen A, Mahalanabis D, Singh AK, Som TK, Bandyopadhyay S. Development and effects of a neonatal care unit in rural India. The Lancet 2005;366: 27-28.

effectiveness and cost are dependent on this. Development of health system should be considered in a phased manner, starting with the use of existing Institutions and available resources- both physical and human. Additional inputs may be required to address the existing bottlenecks. The amount of effort or resources invested to achieve the outcomes also needs to be analyzed. Unfortunately, this has not been addressed till now.

2.5 Sustainability

It is important to assess whether the efforts would ensure long term sustainability. Most of the interventions are effective when done in a project mode but tend to wane off with time or when it gets incorporated with the health system. Strengthening of the health system is the key strategy which normally happens as new programs get implemented through the existing health care system. It is therefore important to assess how the centers perform when these get incorporated within the system.

2.6 Impact

The Purulia Model shows that compared to the baseline data, NMR was reduced by 14% in the first year and by 21% in the second year after SCNU became functional. Reduction in NMR may not be evident but it is always prudent to analyze the output, particularly in terms of implementation of the project. The mainstay of the evaluation would be to identify the region specific 'implementation constraints' and suggest ways to overcome them. This will entail corrective measures to be taken in the initial phase itself which will go a long way in reducing NMR and IMR.

2.7 Research questions

- Do SCNUs have the capacity to respond to management of sick newborns?
- Are these SCNUs equipped to deliver good quality services?
- Are these services utilized by the community and if yes, at what cost?
- What are the bottlenecks identified in setting up and functioning of these units?
- What has been the outcome in terms of:
  - Provider's perceptions
  - Client satisfaction
  - Number of newborn admissions and mortality

3. Project goals and objectives

Goals of the project:

- To improve functioning of the existing SCNUs.
- To gather experiences for scaling up of new SCNUs in other districts.

Objectives:

The study evaluated the SCNUs with the following objectives:

- To do a situational analysis of the capacity of SCNUs to respond to sick newborns.
- To examine the resources available in the SCNUs.
- To assess the utilization of services by the community
- To identify the bottlenecks in setting up and functioning of the units.
- To set forth recommendations to overcome them.

4. Methodology

A detailed review of literature was done on facility based newborn care to understand the possible factors that can influence the functioning of a unit. Review of the evidence and consideration of the broader context of knowledge, experiences and recommendations enabled us to summarize the factors influencing facility based care in the form of a conceptual framework. (Fig 1)

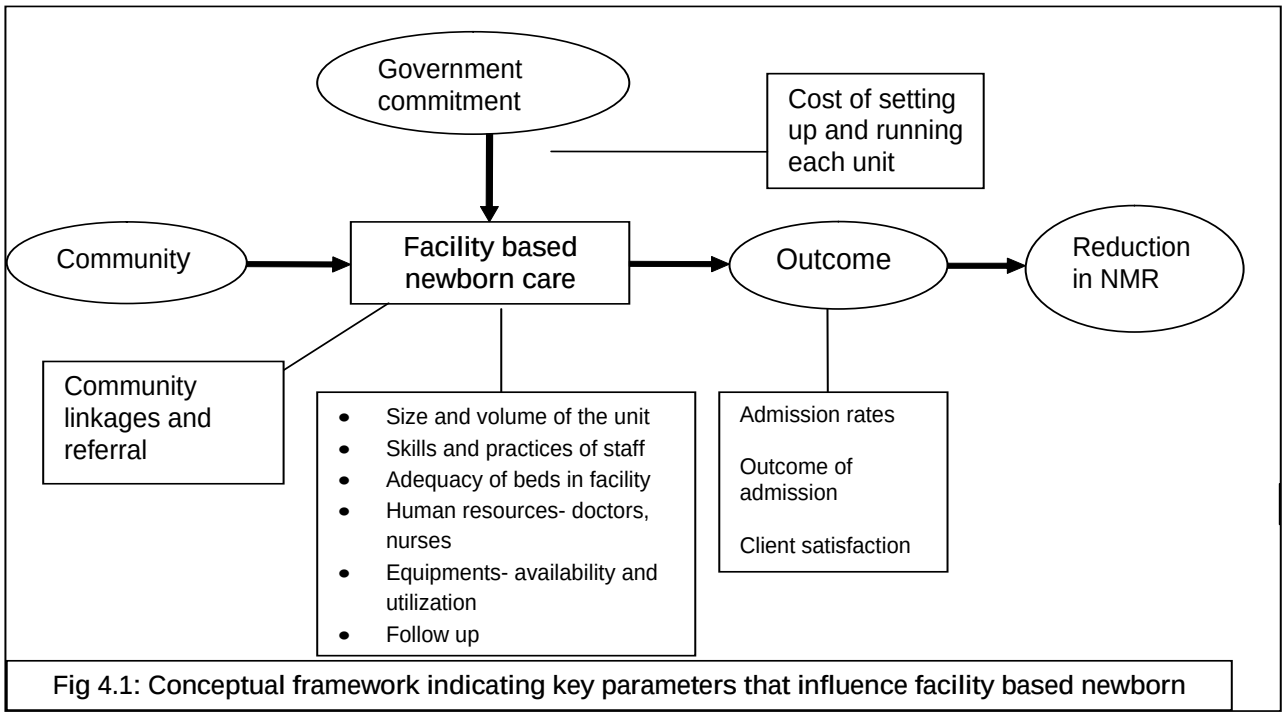
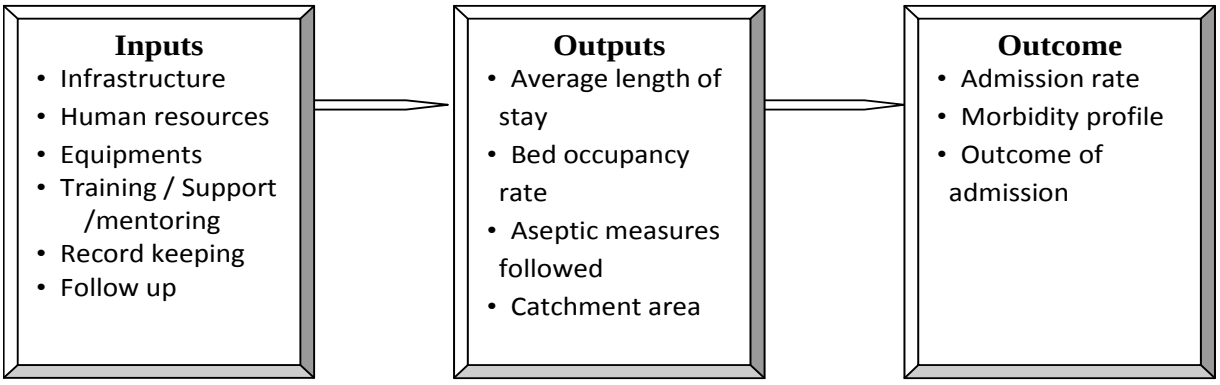


Fig 4.1: Conceptual framework indicating key parameters that influence facility based newborn

For the purpose of evaluation, we examined most of the parameters listed in the framework and interpreted the results/ indicators as mentioned below:



Each of the parameters was assessed from secondary and primary data. Secondary data reflected the information collated by the heads of the SCNUs of the respective units from their existing records. Primary data was gathered by the research team through one-to-one interviews. It was aimed to gain an in-depth understanding of the perspectives of care providers and the community. This component was used largely to interpret the results obtained from secondary data and to triangulate the observations.

4.1 Study design- cross sectional; retrospective analysis of secondary data

4.2 Duration of the study- The evaluation of all the selected SCNUs was conducted in 2009-10- over a period of 12 months

4.3 Sampling frame

4.3.1 Sampling technique

Purposive sampling technique was used to identify the study site and study population.

4.3.2 Selection of study sites

SCNUs functioning in the districts of Mayurbhanj and Koraput (Orissa); Tonk and Jaipur (Rajasthan); Vaishali (Bihar); Dibrugarh (Assam); Andaman and Nicobar islands; Guna and Shivpuri (Madhya Pradesh); Lalitpur (Uttar Pradesh); Purulia (West Bengal) were considered. We selected the sites purposively based on the following characteristics:

- Those that were functional for last 2 years
- Those that were supported by UNICEF
- Those that were initiated by UNICEF but currently not supported

We selected Mayurbhanj, Tonk, Vaishali, Dibrugarh, Guna, Lalitpur, Port Blair and Purulia for the assessment.

4.3.3 Study tools

Different tools were devised for secondary and primary data collection. The questions basically captured the information reflected in the conceptual framework.

4.3.3.1 Tool for secondary data collection- a preliminary secondary tool was prepared to collect the quantitative information pertaining to SCNU. A meeting of the expert panel (constituted by representatives from Indian Academy of Pediatrics, National Neonatology Forum, UNICEF and PHFI) was scheduled for a detailed feedback session on tool design and methodology to be adopted for data collection. The modifications and recommendations, as suggested by the experts were incorporated and secondary tool was finalized **(Annexure-1).**

4.3.3.2 Tool for primary data collection-In order to capture the experiences of the stakeholders, implementers and beneficiaries, primary tools were designed. Different set of primary tools were formulated for conducting facility and community based interviews.

A query was floated on the solution exchange forum (Annexure-2), wherein members were requested to share their opinions and experiences pertaining to the special care newborn units or any community level initiatives pertaining to neonatal health. The query was well received and a range of responses were received. Different experts shared their good and bad experiences, constraints and challenges and opinions on the setting up and operations of a SCNU. The discussions on the solution exchange guided the formulation of the primary tool. The themes and the subthemes were conceptualized which the primary data would strive to capture. It captured those details which the secondary tool practically failed to and information that could be triangulated.

Components of the primary tools:

(i) PROVIDER'S PERSPECTIVE (Annexure-3) : We prepared separate questionnaires for the care providers at the facility, namely the head of the facility, the medical officers and nursing staff. A detailed interview schedule was structured to cover various managerial and administrative issues and strengths of the unit.

(ii) BENEFICIARIES' PERSPECTIVE (Annexure-4) : The beneficiary by operational definition, implied a case who has had availed or is availing the services at a particular SCNU. The beneficiaries' interviews were grossly categorized in two categories:

a) The Hospital Based- The facility or the hospital based beneficiaries implied the parent of the baby who was then an admitted case in the SCNU (at the time of visit by the research team) and availing the services offered by the facility.

b) The Community Based- The community based beneficiary implied parent of the baby who had availed the services at the SCNU during the last 6 month, preferably last 3 months.

(iii) COMMUNITY WORKER'S PERSPECTIVE (Annexure-5): Besides gaining an insight of the provider's perspective on the one end, and beneficiary perspective on the other end, it was felt important to capture the perspectives and experiences of the field level workers, as linkage between the facility or the providers and the users. The field worker falling into any category, ASHA/ ANGANWADI/ ANM were interviewed.

4.3.4 Study sample/ population:

1. For collection of secondary data, the 8 units selected were considered for analysis.

2. For collection of primary data

(i) For Provider's Perspective: The SCNU Head and 2 doctors (preferably pediatricians) were selected. Amongst the nursing staff, purposely, the head nurse/ nurse in charge was selected and the other one was usually a nurse working in the SCNU for almost a year. A mix of contractual and permanent nurse was created, wherever possible, as the issues of contractual staff were perceived or assumed to be different from that of a permanent one.

(ii) For Beneficiaries' Perspective: Five hospital based interviews were conducted in the hospital premises; the mother / father of the admitted baby were personally interviewed. The community based beneficiaries were selected from the admission/discharge register, from the last 3 month's data. The selected cases were tracked down from the contact details provided in the discharge summary. This period was chosen to avoid recall bias of the interviewee. In case of non availability of a death/ LAMA case within easy reach, the period was extended to last 6 months. A selection mix of cases was created which included discharged alive cases, death cases and LAMA/ DAMA cases. Amongst the five community based interviews, at least one death, one LAMA and three discharged alive cases were interviewed. It was presumed that the experiences of beneficiaries would naturally be different depending on the treatment outcomes, good or bad in discharged alive and death cases respectively. Including a LAMA case was considered to gain an insight into factors which usually are instrumental in making a person decide to leave and take away the baby in a critical condition.

a). For Hospital Based Beneficiaries' Perspective: Another criteria for sampling the cases, was to ensure that there was a right mix of inborn and out born cases amongst the interviewed cases. The inborn cases implied the cases born in the district hospital in which the SCNU was located and an out born case implied the baby born at a facility other than the district hospital. It was presumed that the experiences of an outborn case, in terms of the services provided at the first or the second level facility, the difficulties faced during transportation, the promptness with which the case was attended at the SCNU, the quality of care rendered and the expenditure analysis might be different from that of an inborn case.

b) For Community Based Beneficiaries' Perspective: While selecting the cases for community interviews, strategically cases were chosen from different locations, and at least one case was chosen from a distant area. This was done to avoid bias which could occur because of the possible confounding factors like difference in functional level of the peripheral health care facility in vicinity of the family, the accessibility in terms of means of transportation available and the other socio-economic barriers to access etc.

Thus, in total 10 beneficiaries (five hospital and five community) were interviewed per SCNU, making it to a total of 80 beneficiary interviews, a sample enough for studying the qualitative aspects pertaining to functioning of a SCNU as a unit and the generic issues which cut across the SCNUs.

(iii) For Community Workers' Perspective, a minimum of two field workers working in the catchment area of the SCNU were interviewed.

4.4 Data collection:

4.4.1 Collection of Secondary Data: We mailed the questionnaire to the SCNU-in-charge of the respective units and also UNICEF officials to facilitate the process. The team also communicated with the district officials to help them collate relevant information. The team of two members visited the sites after the units submitted their reports. Most of the data collected was cross checked by the team during their visit. Wherever the information was found incomplete or inconsistent, the records were reviewed.

4.4.2 Collection of Primary Data : A brief orientation and discussion took place among the team members regarding the use of study tools and appropriate interviewing techniques. The research team met with civil surgeon or the chief medical officer of the district hospital before visiting the units. All the interviews were conducted in isolation after taking their consent

4.5 Ethical considerations:

Consent from individuals at health facilities and community was taken prior to their interview after explaining to them about the purpose of the study. The proposal was reviewed by Technical Review Committee of PHFI and ethical clearance obtained. Permission was sought from the concerned authorities to conduct the study after briefing them about the study purpose.

5. Observations and Results

The present evaluation was carried out in Orissa, Rajasthan, Bihar, Assam, Andman and Nicobar, Madhya Pradesh and Uttar Pradesh and West Bengal, where Special Care Newborn Units were functioning in at least one district. This helped to get an insight of the capacity of SCNUs to respond to the sick newborns.

5.1. Background information

Table 5.1.1 State wise distribution of functional SCNUs (as on 31st October 2009)

Name of the State	Number of districts	Number of SCNUs
Rajasthan	33	4
Assam	27	2
Orissa	30	4
West Bengal	19	6
Uttar Pradesh	72	1
Bihar	38	1
Madhya Pradesh	50	14
Andaman and Nicobar	NA	2

Table 5.1.1 shows the state wise distribution of functional SCNUs. Functionality here refers to presence of infrastructure and admission of sick neonates. Maximum number (14) of functional SCNUs were present in Madhya Pradesh, while this number was found to be minimum in Uttar Pradesh and Bihar with the presence of one SCNU in each state.

Table 5.1.2 District wise distribution of functional NSUs

District	No. of Neonatal Stabilization Units	Names of the NSUs
Tonk	1	
Dibrugarh	0	
Mayurbhanj	4	Udala, Rairangpur, Kaptipada
Purulia	9	Hura RH, Banshgarh RH, Kotshila RH, Manbazar RH, Kashipur BPHC, Barabazar BPHC, Joypur BPHC, Jhalda BPHC, Banda BPHC
Lalitpur	0	-
Vaishali	0	-
Guna	2	Ragogarh, Binaganj
Port Blair	4	

The functional NSU means a neonatal stabilization unit organized with personnel and equipment to perform neonatal resuscitation, identify severity of an illness, stabilize and transfer sick newborns. Maximum number (9) of functional NSUs were found to be present in West Bengal. Orissa and Andmaan & Nicobar ranked second with 4 functional NSUs, while Madhya Pradesh and Rajasthan were having 2 and 1 NSU respectively. The condition was found to be poor in Uttar Pradesh and Bihar as no NSU was functional. Not only the nuber but the distribution of units is also important for effective utilization of services.

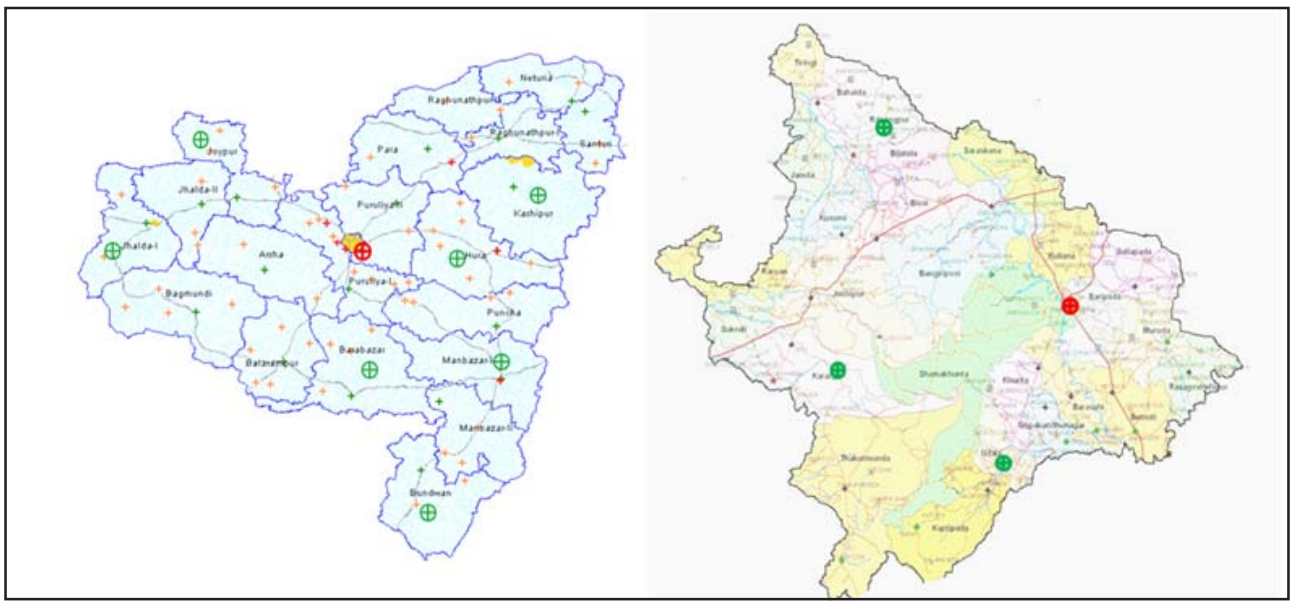


Plate 5.1 Distribution of functional SCNUs and NSUs

5.2 Infrastructure of SCNUs

5.2.1 Location of the SCNU

The location of the unit should be in a distinct area within the health care facility, with controlled access and environment. The unit should be in close proximity to the labour room. If obstetric and neonatal services are on the separate floors, provision for quick access like ramp or an elevator should be provided. Additionally there should be a quick access if the unit is receiving infants from other units also.

The location of labour room was not close to SCNU in majority of the centers i.e. Vaishali, Port Blair, Dibrugarh, Mayurbhanj and Purulia. The labour room was on the ground floor at all the 8 centers but the SCNU was on the first floor in Dibrugarh , Mayurbhanj and Port blair, whereas it was on the second floor in Purulia. Exceptionally the SCNU was located in a different building altogether in Vaishali. The SCNUs were found to be on the same floor in Tonk, Lalitpur and Guna districts.

The location was well displayed in all the units visited. There were directions given at the prominent places.

Vaishali

Lalitpur

Port Blair

Plate 5.2 Location of SCNUs in Vaishali, Lalitpur and Port Blair

5.2.2 Layout of the SCNU

The SCNU design should be driven by a systematic plan of space utilization, projected bed space demand, staffing requirements and other basic information related to the unit. The ideal design should provide constant surveillance of each bed area from the nurse's station, with minimal of walking distance for the staff.

Layout represents the arrangement of space provided for different activities. Every SCNU was unique in its lay out and suffered from its own space constraints making it difficult to adhere to the norms of the laid down designated spaces. The following table 5.2.1 gives an account of the various designated spaces in the SCNUs. The initial distinction of having 2 separate units (inborn and outborn) no longer holds good in many places since it is difficult to adhere given the admission load. Space constraint was also there in units established earlier like Purulia, Tonk and Mayurbhanj. In Purulia and Port Blair, mothers were encouraged to enter the unit after taking due precautions and practice kangaroo mother care and breast feed. In Guna, a separate area was demarcated for breast feeding that was isolated and privacy maintained.

The following table describes the different areas in SCNUs.

Table 5.2.1 Availability of space for different activities in SCNU

District / Areas	Step down room	Breast feeding room	Hand-washing/ gowning	Soiled utility room	Boiling/ autoclaving room	Doctor duty room	Nurses' duty room	Side lab
Tonk	√	-	√	-	-	-	-	-
Dibrugarh	-	-	√	√	√	√	√	√
Mayurbhanj	√	√	√	-	√	-	√	-
Purulia	√	-	√	√	√	√	√	-
Lalitpur	-	√	√	√	√	√	√	√
Vaishali	√	-	√	-	-	√	√	-
Guna	√	√	√	√	√	√	-	√
Port Blair	√	-	√	√	√	√	√	√

Plate 5.3 Mother breast feeding her baby in Port Blair

Plate 5.4 Mother providing KMC in Purulia

There seemed to be some discrepancy in terms of defining breast feeding room and step down room. While designated areas for both the rooms are present in Guna and Mayurbhanj, this kind of differentiation was found to be lacking in most of the places. In Purulia and Port Blair, a space demarcated for breast feeding was absent. Mothers were encouraged to enter the nurseries after taking due precautions for breast feeding. Hand washing/gowning room was found to be present at every SCNU, but the autoclaving room was e absent in Tonk and Vaishali. Doctor's duty room was present at every SCNU except Tonk and Mayurbhanj, while nurse's duty room was reported to be absent at Tonk and Guna SCNU. The side lab facility was available only at Dibrugarh, Lalitpur, Guna and Port Blair SCNU.

Plate 5.5 Step down unit in Guna

Plate 5.6 Step down unit in Port Blair

Plates 5.7, 5.8 and 5.9 are the representation of layouts of SCNUs of some units. It can be very well interpreted that the layout of the SCNU of district Mayurbhanj was literally good as the newborn keeping unit was situated at one corner away from the other divisions of SCNU i.e. nurse's sitting room, gowning room, waiting room, and hand washing room. Newborn keeping unit was further divided into two sections by glass partition for the ease of keeping the infants on their inborn/ outborn status. Glass partition also facilitated the easy viewing of all the infants in both the sections by the attending nurses. Before the entrance, a waiting room was provided so that the attendants of the newborn could wait there. Also a separate gowning room adjacent to the waiting room was provided so that mothers could change and then attend their baby. A separate unit for washing, store room, sister's store room, and toilet was also present at another side of the SCNU. The arrangement of all the divisions was such that it facilitated the hassle free movement of all the individuals involved.

Whereas in Port Blair, distinction between inborn and outborn babies did not exist. Tonk suffered from a disadvantage since the beds were located in between the entrance and the area designated for infant keeping activities. This resulted in to and fro movement of people inside the unit very often that could be a predisposing factor to infections. There was a space allocated for breast feeding but that was insufficient for more than three mothers to enter at a time. Besides, that area was not isolated and chances of cross infection were also there. Often babies were handed over to mothers who took them to the step down room (located on a different floor) and returned the baby after breast feeding.

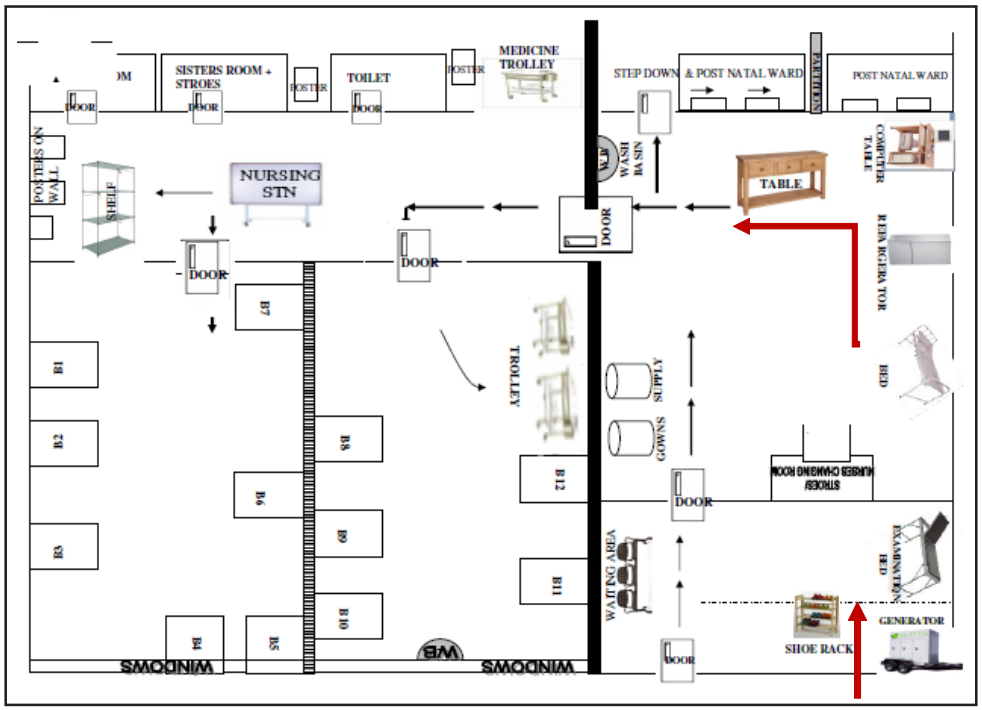


Plate 5.7 Lay out of Mayurbhanj SCNU

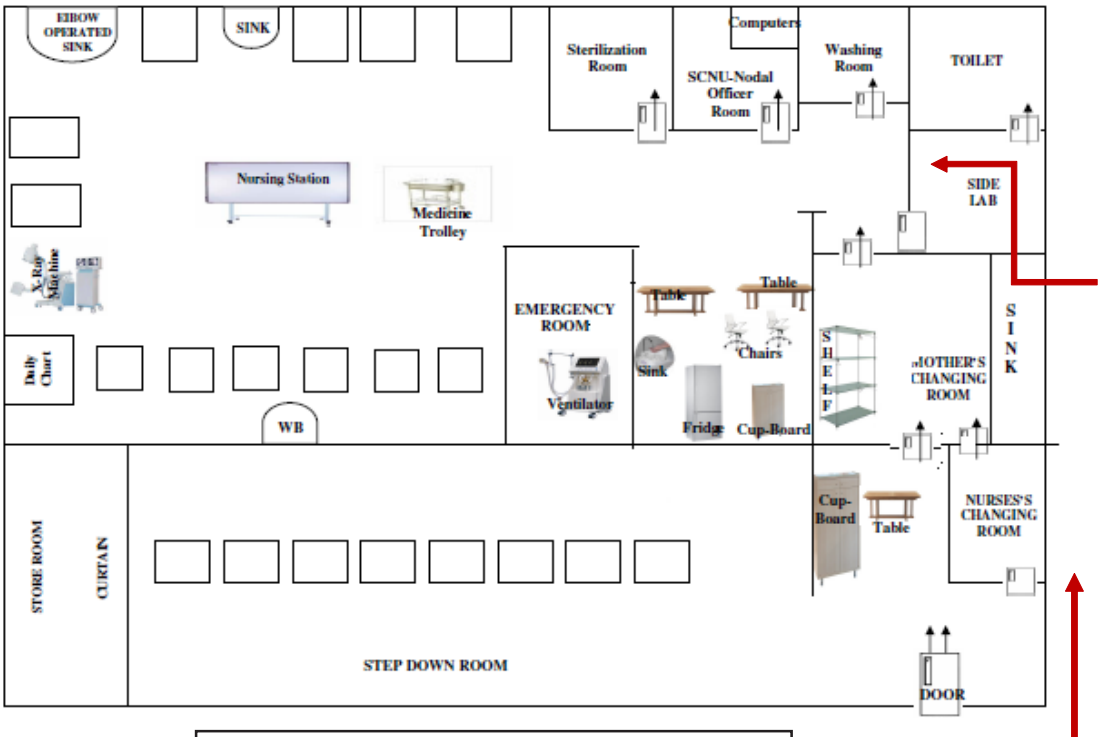


Plate 5.8 Lay out of Port Blair SCNU

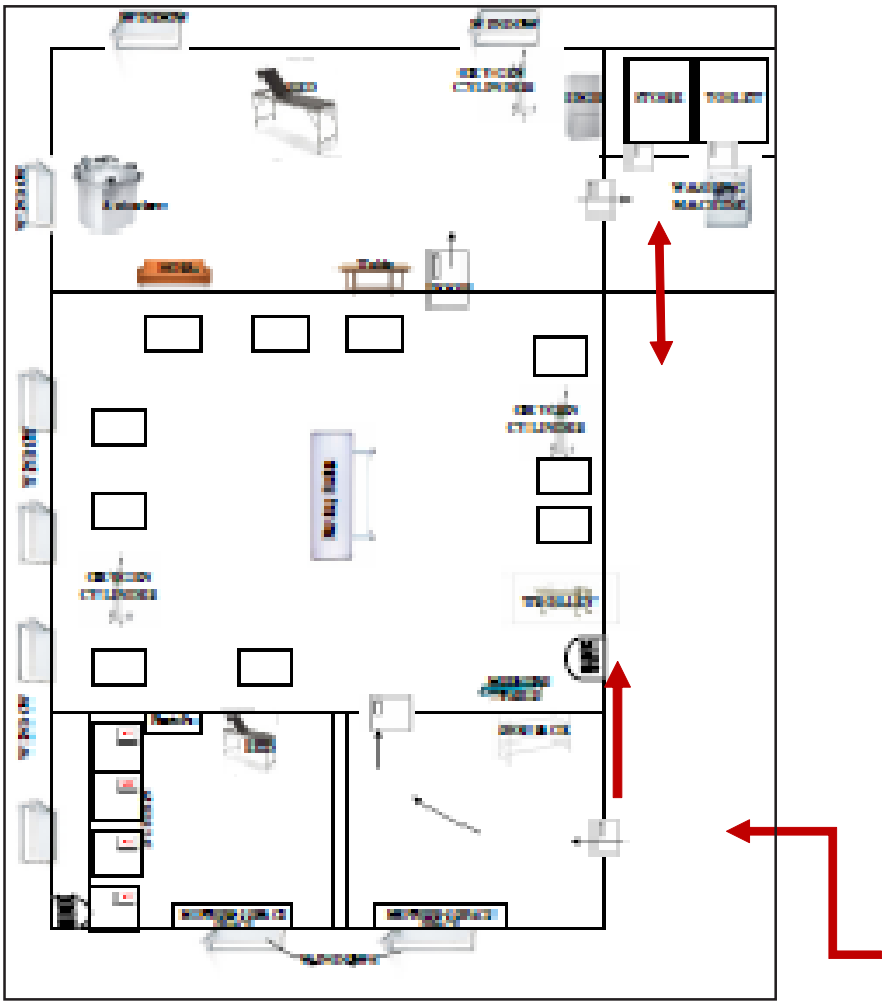


Plate 5.9 Lay out of Tonk SCNU

5.2.3 Number of beds in different SCNUs

The number of beds varied across the SCNUs depending on the space constraint and other factors associated. Guna SCNU had the maximum beds (20 beds), whereas Purulia SCNU had 14 beds

The strategy of segregation of beds was also adopted depending upon the inborn/outborn status, which currently exists in Guna and Dibrugarh. Mayurbhanj and Lalitpur also had it initially but it was difficult to follow owing to admission overload in Mayurbhanj, while in case of Lalitpur, one half was not utilized, therefore this strategy could not run for long in most of the districts. No such segregation existed in Vaishali, Tonk, Port Blair and Purulia. It is interesting to know that Purulia had a fixed number of beds for the families belonging to below poverty line status (7 beds). Most of the times, these beds remained filled and new patients had to be accommodated in paid beds. However, there was no policy to transfer a BPL patient from a paid bed to a free bed after the BPL beds get vacant. Table 5.2.2 gives the number of beds available in different SCNUs.

Table 5.2.2 Availability of beds

SCNU	Number of deliveries in 2009	Total No of beds	Beds in step down room
Tonk	5366	12	8
Dibrugarh	6147	17	-
Mayurbhanj	6582	12	4
Purulia	8453	14	4
Lalitpur	6780	12	-
Vaishali	8623	13	5
Guna	8475	20	
Port Blair	2769	14	8

5.2.4 Floor area

Each newborn space should contain a minimum of 100 square feet of clear floor space, excluding hand washing stations and columns. This 100 square feet area should be divided as 50 square feet for baby care area and 50 square feet for general support and ancillary areas. Table 5.2.3 gives the floor area per baby that is available in different SCNUs.

SCNUs at Purulia, Tonk and Dibrugarh were reported to achieve the standard.

Table 5.2.3: Availability of total floor area per bed/baby

Unit	Floor area in square ft/ bed
Tonk	47.4
Dibrugarh	47.0
Mayurbahnj	33.4
Purulia	50
Lalitpur	63.8
Vaishali	38.5
Guna	40.4
Port Blair	59.0

5.2.5 Laboratory investigations

Only 50 percent of units had designated area for side lab but the side lab was functional only at the Port Blair unit because of the presence of a lab technician. Routine investigations were carried out in side lab in Port Blair. Biochemical and other microbiological investigations were got done from the district lab. In Tonk, the district lab was utilized for investigations whereas there was a huge dependence on the private sector in Purulia, Lalitpur and Vaishali. The delay in reporting and erroneous reporting were the reasons stated for referring the cases to the private sector. Investigations were sent to the district lab in Guna where there was a technician available for 24 hours.

Plate 5.10 Side lab in Port Blair

5.2.6 Protocols and policies

The protocols for hand washing were available at all centers but the practice of washing hands was found to be strictly followed only in Purulia. The protocols for biomedical waste management were available at all units except Vaishali and Lalitpur. Color coded bags were used for waste disposal at all the centres. The guidelines and SOPs for patient management and handling were not available in Lalitpur, Guna and Vaishali. Though NNF has laid down and clearly spelt the admission and discharge criteria, the same could not be percolated down to these levels at most places. Even though the criteria was available with most of the units, neither it was publically displayed at most of the units, nor it was strictly adhered to. None of the protocols except the admission and discharge criteria was displayed in Guna.

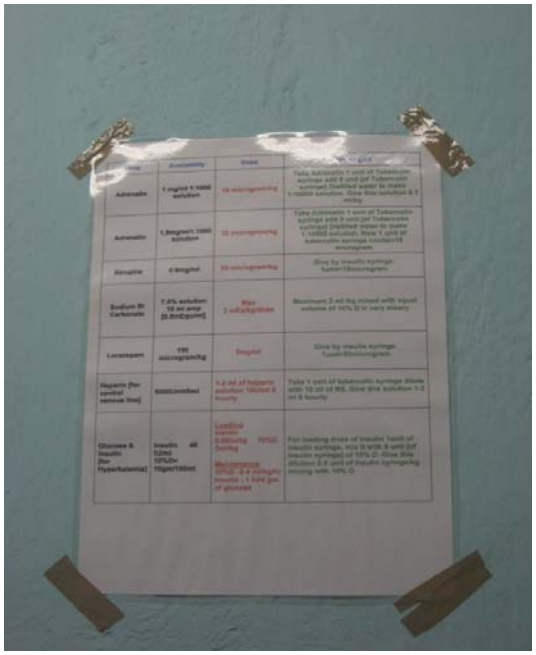


Plate 5.11 Protocols and Policies in Purulia

Plate 5.12 Protocols and Policies in Mayurbhanj

Plate 5.13 Protocols and Policies in Tonk

Plate 5.14 Protocols and Policies in Port Blair

5.2.7 Hygiene and asepsis

The SCNU was cleaned on daily basis but the frequency of cleaning varied across units ranging from one time in Lalitpur to three times in Port blair and five times in Guna . Though continuous water supply was available at most of the units, there was an acute shortage of water in Mayurbhanj SCNU because it was not having a separate overhead tank.

Waste disposal generally followed the laid down standards in all the SCNUs . Dustbins of different color codes were present in all the SCNus. But due to paucity of space these dustbins were placed very close to the cots in some units. This could possibly act as a source of infection for babies.

Plate 5.15 Protocol for waste disposal in Mayurbhanj

Plate 5.16 Beds placed closed to dustbins in one unit

5.2.8 Security for staff

In none of the SCNUs except Guna a security guard was present at the entrance. The lay out itself had a provision for a dedicated space for the security guard to keep a watch on the people entering the unit. Even a register was maintained by him to keep a track of all who entered the SCNU.

Plate 5.17 Security guard in Guna

5.2.9 Back Up and Power Supply

Generators were available at all units. Invertors were not available at any unit except in Mayurbhanj. The power of generator varied from 15 KW to 25 KW which reflected lack of compliance and adherence to the protocols. Most of the units except Vaishali and Tonk were running on common generator for the hospital instead of having a designated one for the SCNU. All the units except Tonk had stabilizers for the equipments.

5.2.10 Visibility of day light

It is recommended that at least one source of daylight should be visible from baby care areas. The day light was visible at all the centers except in Tonk, Purulia and Port Blair where the lay out did not allow for the day light to be visible.

5.3 Newborn Care Corners

In this study a functional newborn care corner in labour room is defined as the one which has a dedicated space for neonatal resuscitation, a functional radiant warmer and trained staff. Following was the status of newborn care corners in the units evaluated (table 5.3.1).

Table 5.3.1 Functional status of Newborn Care Corners

	Tonk	Mayurbhanj	Purulia	Vaishali	Guna	Port Blair	Dibrugarh	Lalitpur
Dedicated space	√	√	√	√	√	√	√	√
Functional radiant warmer	x	x	x	x	√	X	X	√
Trained staff	√	√	√	√	√	√	√	√

The new born care corners were available in the labor room of all and operation theatre of most (7/8) SCNUs with all the equipments, namely, radiant warmer, oxygen, self inflating bag and laryngoscope available at the units. Lalitpur, however did not have a laryngoscope in the newborn corner. Radiant warmers were non functional in many units. The newborn care corners though available, were usually not being put to use at most of the units. Babies were more often than not directly referred to the SCNU, leading to even over referral of the cases. The new born care corners which were functional earlier had become redundant reflecting the lack of understanding of the importance of new born care corner and undue over dependence on the SCNU. Lack of following of admission and discharge criteria of the SCNU was also responsible for the same. It was usually the staff nurse present in the labour room who managed the new born corner. In Vaishali, the head nurse of SCNU was posted in labor room.

Plate 5.18 Newborn care corner in OT in Vaishali

5.4 Coordination with other departments/ periphery

It has often been deliberated and documented that SCNU in isolation cannot function optimally. A lot of networking within the hospital and outside is essential.

5.4.1 Coordination with Labor room:

The ideal practice is to resuscitate every newborn in the labor room/ newborn corners and transfer the babies requiring special care to SCNUs. But a common practice observed was that because newborn corners were functioning suboptimally in most centers, there was a tendency to transfer babies to SCNUs even for minor complaints. This often resulted in unnecessary referrals of inborn cases. In Guna, the doctor on call from SCNU was called for initial screening in most of the cases before they were transferred to SCNU directly. In Vaishali too, babies were referred to SCNUs but owing to the distance they often did not reach SCNUs. Patients were shunted to the private clinics instead.

5.4.2 Coordination with peripheral units:

This networking was strong in Purulia. There was a mechanism of transferring babies to NSU first before taking them to SCNU. A referral transport liaisoned with health department made it functional. Such a transport system on payment basis existed in Vaishali also but clients preferred to take their babies to private doctor.

Coordination with stabilization units was extremely good in Guna. Call center, which was a strong facilitator of transport of antenatal cases under Janani Suraksha Yojana, receiveed phone calls for transfer of sick newborns. It was, however done on payment basis when the study was undertaken.

In Mayurbhanj, coordination with NSU located at block level was moderate. Babies were generally referred to tertiary care centres located at state capital instead to level II units.

Plate 5.19 Call centre in Guna to facilitate transport of antenatal cases and sick newborns

5.5 Human Resources

The special care newborn unit is a human resource and an equipment driven unit. Equipments are also dependant on man for their operations, so largely it is the human resource management and practices which influence the effective and efficient delivery of services and patient outcomes. The study has tried to gain an insight into capturing good and bad practices, constraints and pertinent issues within.

5.5.1 Availability of Human Resource

Availability of human resource is critical to the adequate functioning of any Special Care Newborn Unit. However, the available manpower for SCNU will differ from state to state and would also depend on the number of beds available in the unit. The recommended staffing for a 12 bedded unit is:

Physicians	3
Staff Nurses	10
Support Staff	4

Thus ideal bed to doctor ratio should be 4:1, nurse: bed ratio should be 1:1.2 and support staff: bed ratio should be 3:1.There was scarcity of manpower at most of the centers. There was a dearth of trained doctors and nurses as reflected by the following table:

Table 5.5.1 Availability of doctors in SCNUs

	Sanctioned position	Filled	Pediatricians	Contractual	Permanent	Arrangement	Designated exclusively for SCNU
Tonk	3	3	3	0	3		0
Dibrugarh	4	3	3 + 2 PG students	1	2		3
Mayurbhanj	3	3	3	-	3	2 from periphery, SCNU head from DH	0
Purulia	3	3	1	0	3	Deputed from periphery	0
Lalitpur	3	2	2	1	1	1 deputed from Jhansi	2
Vaishali	5	5	3	0	5	Deputed from periphery	5
Guna	4	3	3	3	0	-	4
Port Blair	3	2	2	1	1	-	0
Total	28	24	22	7	18		14

Table 5.5.2 Doctor: Bed ratio in different SCNUs

	Beds	All doctor :bed	Pediatricians : bed	Doctor : bed ratio after adjustment*
Tonk	12	1: 4.0	1:4.0	1:4.0
Dibrugarh	17	1: 5.7	1:5.7	1:4.3
Mayurbhanj	12	1: 4.0	1:4.0	1:4.0
Purulia	14	1: 4.7	1:7.0	1:5.6
Ialitpur	12	1: 6.0	1:6.0	1:6.0
Vaishali	13	1: 2.6	1:4.3	1:3.3
Guna	20	1: 6.7	1:5.0	1:5.0
Port Blair	14	1: 7.0	1:7.0	1:7.0

***** weights given were 1 for pediatricians (MD/DCH), 0.5 for non pediatricians and post graduate students

Though most of the doctors were on a permanent roll, they were generally transferred from the PHCs. In most of the units (except Vaishali and Guna), they had to take charge of the pediatric wards and emergency duties in addition to SCNU duties.

Recruitment of Pediatricians for SCNU was a challenge as working at the district was not perceived to be lucrative by the pediatricians when compared to the earning potential the private sector offers in the cities. The infrastructure available at the district level also did not meet their aspirations. The SCNU Heads of the four units also reported having advertised for the posts of pediatrician but no applications were received in response to the advertisement. This indicated lack of willingness amongst doctors to work at the district level at the salary offered as well as the position was not considered lucrative enough. Getting the posts filled was a challenge in itself, thus the posts at most of the units had been filled either by transfer / on deputation basis from the periphery or some intra hospital arrangements.

Yet another observation was that many doctors working in SCNU were involved in private practice. Though not explicitly mentioned, it was apparent that doctors depend on SCNUs for their private practice as well.

Doctors were employed on the contractual basis under NRHM. A contractual position, by virtue of its nature, did not offer job security and other benefits like HRA or PF, which a permanent one does. A contractual personnel also had an option of leaving the job open for a better opportunity. The salary offered to a contractual Pediatrician was a consolidated sum of Rs 25000 pm. The SCNU is an intensive care unit requiring availability of the trained doctor either in person or on the on-call basis. At most of the centers, contractual doctor neither got HRA nor any accommodation in the hospital premises, thus ensuring availability at night even on the on -call basis was difficult.

Table 5.5.3 Availability of nursing staff in SCNUs

Nurses	Sanctioned position	Filled	Qualified nurses	Contractual
Tonk	8	8	8	7
Dibrugarh	24	21	21	19
Mayurbhanj	11	10	10	10
Purulia	Not known	20	14	6
lalitpur	6	6	6	6
Vaishali	13	13	4	0
Guna	13	10	10	10
Port Blair	12	8	8	8

The nursing staff was insufficient in Tonk, and Lalitpur. Though apparently the nursing staff seemed not to be a problem in other districts, there was an issue of availability of qualified staff nurses. For bridging the human resource constraint since inception, a lot of contractual positions were created. Out of a total of 96 nurses across all the units, around 68 percent of nurses are on contractual basis. In a context of scarcity of qualified staff nurses, a 'task-shifting' approach (the delegation of healthcare tasks to less specialized health workers) had been followed at Purulia and Vaishali centers.

A new cadre of skilled manpower called special nurse assistants or newborn aides was created to overcome the problem of skilled manpower shortage. One year of training programme for nursing aides was initiated in the year 2005 in Purulia. Till the year 2007, 18 Newborn Aides were trained in Purulia. They provided support to the nurses at SNCU and NSUs. Similarly, there were nine ANMs amongst the nursing staff in Vaishali

Lalitpur SCNU had a huge constraint of nurses as the number of nurses was halved as the unit was handed over to NRHM; the underlying purpose was to decrease expenditure.

Table 5.5.4 Nurse: Bed ratio in SCNUs

	BEDS	All Nurses: bed	Nurses: bed ratio after adjustment*
Tonk	12	1: 1.5	1:1.5
Dibrugarh	17	1: 0.8	1:0.8
Mayurbhanj	12	1: 1.2	1: 1.2
Purulia	14	1: 0.7	1:0.8
lalitpur	12	1: 2	1: 2
Vaishali	13	1: 1	1: 1.5
Guna	20	1: 2	1: 2
Port Blair	14	1: 1.8	1: 1.75

* weights given were 1 for qualified nurses, 0.5 for newborn aides and ANMs

Plate 5.20 ANMS in Vaishali SCNU

Plate 5.21 Newborn aides in PuruliaSCNU

5.5.2 Job Satisfaction

SCNU nurses were motivated by a feeling of responsibility, working in an environment of mutual reliance in which differences were dealt with a team spirit. SCNU offered a decent physical working environment. Professional development in terms of training and good learning exposure increased staff's motivation and practices.

Salary level was strongly linked with motivation and retention of the staff. There was a relative job dissatisfaction amongst nursing staff, primarily attributed to the lesser salary which did not commensurate to the work as perceived by majority of the staff. The salary of contractual staff also varied from state to state; it was Rs 8000 per month at most of units but it was as low as Rs 4500 pm in Tonk, Rajasthan. The contractual nurses in Lalitpur got Rs 15000 pm and were satisfied with the same. In Mayurbhanj, during the initial days, they used to get Rs 8500 which was reduced to 6500 after NRHM took over. This huge variation in salary had led to the dissatisfaction among the contractual nurses in almost all the districts surveyed.

The contractual doctors at most of centers got Rs 25000 per month except in Guna, where they got Rs 35000 per month. Simultaneously there was no extra allowance which made the total amount much less as compared to their counterparts working in the private sector. Besides these contractual doctors at SCNUs were often not relieved from their duties even during festivals and/or for personal reasons because of shortage of manpower. This further contributed to the decreased motivation among these contractual doctors to work at the respective SCNUs.

5.5.3 Retention pattern of Appointed Staff

Attrition of doctors and nurses did not seem to be a major problem at the time when this study was conducted. Most of the doctors and nurses were less likely to work in remote areas (where SCNUs are usually located). Career plans, salary levels, recruitment, appointment and retention procedures strongly affected where they practiced and where they stayed. Other factors such as proximity to the family, attending courses, opportunities for career development also influenced an individual's decision about where to work.

It was clear from the assessment that the contractual approaches were not likely to be a major contributor to an increase in the health sector workforce, though they may help to address shortages in specific circumstances. Difficult working and living conditions and limited incentives may all contribute to poor staff retention in future. In addition, transfer policies in place for the staff were a concern raised by doctors and nurses. Many of them said that district transfer policies should have room for the skills acquired through experience and trainings of the staff. In this study, the proportion of transferred trainees who remained within the same district was notable; however, in some cases the nurses were redeployed to a facility not equipped to provide the specialized service for which he or she was trained.

5.5.4 Ancillary staff

There was a problem of sweepers and aayas in most centers. Their role is crucial for maintenance of hygiene. The number of sanctioned positions was less as compared to the given workload especially in Purulia and Port Blair. All the sanctioned positions were reported to be filled in all the SCNUs except in Tonk district, where an insufficiency was felt.

Table 5.5.5 Availability of ancillary staff

	Sanctioned position	Filled	Contractual
Tonk	4	3	3
Dibrugarh	16	12	8
Mayurbhanj	4	4	4
Purulia	1	1	1
Lalitpur	3	1	1
Vaishali	4	4	4
Guna	6	6	6
Port Blair	6	6	6

5.6 Equipments and drugs

The special care new born unit is largely an equipment driven unit. The major share of the investment going into this resource intensive set up is on the equipments, thus ensuring the optimal utilization of the same is critical to the successful functioning of the unit. An objective assessment was carried out to assess the availability and functional status of equipments and issues, if any pertaining to repair and maintenance of the same.

The equipments were donated by the UNICEF during the initial phase of set up. In due course of time, the responsibility of maintenance and repair of equipments got transferred to NRHM. The average fixed component of the cost during the initial installation phase was Rs 85- 100 lakhs. The running cost was approximately 15 lakhs per annum including the variable component being directly proportional to number of years of usage. With nearly 100 percent bed occupancy at most of the units, the load on equipment was huge, as they were operating almost on a 24 hrs basis. The major equipments on an average had a shelf life of 6 yrs beyond which they needed replacement.

Table 5.6.1 Status of availability of essential equipments

Name of the Equipment	No of units prescribed for a 12 bedded unit	Tonk	Dibrugarh	Mayurbhanj	Purulia	Lalitpur	Vaishali	Guna	Port Blair
No of beds in main unit	12	12	17	12	14	12	13	20	14
Baby warmer	12	12	10	9	16	14	13	24	13
Pulse Oximeter	6	1	2	1	3	7	2	8	4
Suction Machine	2	5	3	4	NA	NA	7	1	8
Electronic weighing machine	4	2	4	1	2	1	?	5	1
Phototherapy unit	6	4	16	2	9	3	2	8	6
Non invasive BP monitors	6	NA	13	NA	1	7	NA	NA	1
Oxygen concentrator	4	4	6	6	10	7	3	10	12
Generator	1	1	1	1	1	1	1	1	1
Autoclave	1	1	2	2	1	1	1	1	1
Washing machine	1	1	1	1	3	1	1	1	1
Refrigerator	1	1	1	1	1	1	1	1	1
Air conditioner	1	2	5	3	5	4	8	7	4
Head boxes for delivery of oxygen	6	12	Available	10	10	14	13	20	Available

Table 5.6.2 Status of availability of desirable equipments

Desirable equipment									
	No of units prescribed for a 12 bedded unit	Tonk	Dibrugarh	Mayurbhanj	Purulia	Lalitpur	Vaishali	Guna	Port Blair
Heart rate / Apnea monitor	1		13		1	7		8	NA
Low reading clinical Thermometer	12	12	17		20				13
Room Thermometer	?	1			2			2	1
Mechanical baby weighing machine	4	2		1	1		2		NA
Self Inflating bag	12	12	4	1	4	2	4	3	3
Infant Lyrangoscope	6	12	3	2	3	1		3	3
Syringe pump	3	9	18	2	2	2	6	9	8
Oxygen cylinder		8		1		2	10	40	6
Microscope	1	NA	NA	NA	NA	NA	NA	NA	1
Wall clock with second's hand	2	1	1	2	6	2	3	3	1

	Available in adequate quantity as prescribed
	Available but not adequate

Note: Figures in red are exactly as reported by the respondent at the time of interview.

Table 5.6.3 Functional status of equipments across the SCNUs at the time of visit

Name of the Equipment	Tonk	Dibrugarh	Mayurbhanj	Purulia	Lalitpur	Vaishali	Guna	Port Blair
Monitoring equipments								
Pulse Oximeter	1/1	1 / 2	1/1	1/3	7/7	2/2	7/8	3/4
Mechanical weighing machine	NA	NA	1/1	2/2	NA	1/1	5/5	NA
Electronic baby weighing machine	2/2	1 /2	1/1	1/1	1 / 1	0/1	5/5	1/1
Digital clinical Thermometer	12/12	6 /6	NA	17/20	NA	1/1	NA	4/13
Therapeutic equipments								
Baby warmer	7/12	8 /10	8/10	11/16	10/14	10/13	20/24	4/13
Phototherapy unit	4/4	12/16	1/2	7/9	2/3	2/2	8/8	2/6
Resuscitation equipments								
Self Inflating bag	12/12	3/3	1/1	2/4	1/2	4/4	3/3	3/3
Infant Laryngoscope	12/12	2/2	2/2	3/3	1/1	1/1	3/3	3/3
Syringe pump	5/9	9/9	2/2	1 / 2	2/2	2/2	7/8	4/8
Suction Machine	3/5	1/3	NA	NA	3/3	2/2	1/1	4/8
Oxygen concentrator	2/4	5/6	5/6	8/10	0 /7	2/3	4/10	3/12
Miscellaneous equipments								
Autoclave	1/1	1 /2	1 /2	0/1	1/1	1/1	1/1	1/1
Washing machine	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Refrigerator	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Air conditioner	2/2	4/5	3/3	4/5	4/4	6/6	6/7	4/4
Generator	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

*functional units are expressed as a fraction of available units

	Functional equipments available in optimum number
	Functional equipments available inadequate number

5.7 Key issues pertaining to functional status of the Equipment

5.7.1 Frequent Break Down of the Equipment

Apart from the availability of the equipments, the issue of repair and maintenance was found to be a major problem grappling all the special care new born units visited. The break down was more often than not an uncalled for, unspeculated even, which in case of a life saving equipment or a monitoring device had serious implications.

The most common reason for breakdown of equipment was found to be non availability of continuous supply of electricity in most centres and voltage fluctuations especially in Dibrugarh and Lalitpur. Another major reason for the same was the mishandling of the equipment as observed at various centers. Frequent breakdown of equipment in an intensive life saving unit, not only had direct loss in terms of the cost of repair but also a much larger indirect loss of the good will and faith of community. The common phenomenon of break down also resulted in suboptimal care in high risk babies. Also, some SCNUs got compelled to keep two or three babies on the same bed, increasing the risk of cross infection, which could have had adverse outcome on the prognosis of the case.

The constant power back up is important for smooth functioning of equipment. Most of the units did not have a designated generator for SCNU in the initial phases and used to operate on the common one available for the hospital. At the time of visit, all the SCNUs relied on generators earmarked for SCNU exclusively. At some of the units like in Mayurbhanj, Vaishali and Tonk, the generators were manually driven leading to the critical time loss.

The sophisticated devices in the SCNU required careful handling, and at none of the centers, the equipment provisioning agency provided any training or demonstration session to the staff on how to use the equipment. There was no equipment handling manual or any instructions chart in any of the units.

Incidences of mass equipment breakdown took place in the Dibrugarh and Lalitpur. The sudden tripping of power due to grid failure had led to mass break down of devices in Dibrugarh whereas an incidental failure of the hospital generator resulted in mass failure in Lalitpur SCNU. Prior to the incidence, equipment in Lalitpur did not have any stabilizer which was provided for equipment. An accidental short circuiting took place in Port Blair and Tonk. But even in such adverse conditions nurses were vigilant enough to transfer the babies immediately to a different place and rescued their lives.

5.7.2 Repair and Maintenance

In many units, no Annual Maintenance Contract (AMC) was done at the time of setting up of the unit. By the time SCNU was taken over by NRHM, most of the equipment had expired the warranty period. Even during the warranty phase in some of the units, the complaints were not attended promptly and the equipment providing agencies kept on lingering and postponing the visit of the service engineer and by then the warranty period had lapsed.

The SCNUs were mostly sited in remote, difficult to reach locations. The equipment providing companies had their offices at the state level. Service engineers at the state level prepared their roster for their round of district visit to attend the complaints but they preferred to plan their route map in a way that the districts falling on a particular route got covered all together. Thus, they had to wait for the adequate number of complaints from districts on a particular route. This made economic sense to the equipment providing company but it delayed attending to the complaints. By the time the turn of the particular SCNU came in the roster, it had already been quite late. This was a critical issue and the situation would worsen in near future, as the equipment would be near their shelf life and the frequency of breakdown would further increase.

A local solution was in place in Guna. Besides the engineers who had to come from state headquarters or from Mumbai, 2-3 local mechanics were identified in the district. They were usually proficient in handling minor complaints and thus it provided a workable solution at the local level.

There was also an evident lack of clarity amongst the SNCU In-charge and the staff at all the units on who needed to be contacted for issues pertaining to the repair and maintenance. Table 5.7.1 gives the time required to repair twoessential equipment (baby warmers, phototherapy units) as reported by the nurses and medical officers. Documents on actual reporting to senior officials about the breakdown of the equipment, the date of initiation of the complaint and date of repair could not be obtained from any of the units.

Table 5.7.1 Reported time for repair of essential equipments

Name of the SCNU	Time required
Tonk	6 months
Dibrugarh	1.5 months
Mayurbhanj	6 months
Purulia	1.5 months
Lalitpur	3 months
Vaishali	1.5 months
Guna	0.5 months
Port Blair	6 months

5.7.3 Need for Annual Maintenance Contract

The need for having AMC is critical to cover both preventive and on-call corrective interventions. Preventive maintenance is to ensure maximum uptime of the medical equipment, assuring accuracy, efficiency and clinical efficacy. On-call intervention aims to act immediately and repair the device, limiting the downtime to the minimum. Though it is highly emphasized, a deeper analysis revealed that merely having an AMC did not resolve the issue. Most of the equipment in the SCNUs visited did not have an AMC. It was however done for some of the equipment in Guna and Purulia. Baby warmers, for instance, had AMC in Purulia, Dibrugarh and Guna. Average time for repair was 6 weeks in Purulia and Dibrugarh and 2 weeks in Guna. On the other hand, in Mayurbhanj and Vaishali, this time period was 6 months and 6 weeks respectively.

Table 5.7.2 Annual Maintenance Contract status of equipments

District	Equipments	AMC If available for the Equipment	No of units broken down out of total available (at the time of the visit)	Time taken to get it repaired as reported
Tonk	Pulse Oximeter	NO	NA	
	Suction Machine	NO	2/5	3 months
	Electronic Weighing Machine	NO	NA	
	Baby Warmer	NO	5/12	6 months
	Phototherapy unit	NO	NA	
	Generators	NO	NA	
District	Equipments	AMC If available for the Equipment	No of units broken down out of total available (at the time of the visit)	Time taken to get it repaired as reported
DIBRUGARH	Non Invasive BP monitors	NO	NA	NA
	Pulse Oximeter	NO	1 / 2	3 -6 months
	Suction Machine	NO	Working	15 days to 1 month
	Electronic Weighing Machine	NO	2	1 month to 1.5 months
	Baby Warmer	YES	2 / 10	6 month
	Phototherapy unit	YES	2 / 3	2 month
	Generators	NO	Working	15 days

District	Equipments	AMC If available for the Equipment	No of units broken down out of total available (at the time of the visit)	Time taken to get it repaired as reported
MAYURBHANJ	Non Invasive BP monitors	NA	NA	NA
	Pulse Oximeter	NO	2/3	1 month
	Suction Machine	NO	Working	NA
	Electronic Weighing Machine	NO	Working	NA
	Baby Warmer	NO	2/10	6 months
	Phototherapy unit	NO	1/2	NA
	Generators	NO	Working	NA
District	Equipments	AMC If available for the Equipment	No of units broken down out of total available (at the time of the visit)	Time taken to get it repaired as reported
PURULIA	Non Invasive BP monitors	NO	NA	NA
	Pulse Oximeter	YES	2/3	6 Weeks
	Suction Machine	YES	1 /2	6 Weeks
	Electronic Weighing Machine	YES	Working	6 Weeks
	Baby Warmer	YES	5/ 16	6 Weeks
	Phototherapy unit	YES	2/9	6 Weeks
	Generators	YES	working	6 Weeks

District	Equipments	AMC If available for the Equipment	No of units broken down out of total available (at the time of the visit)	Time taken to get it repaired as reported
PORT BLAIR	Non Invasive BP monitors	NO	-	NA
	Pulse Oximeter	NO	1/4	
	Suction Machine	YES	4/8	1 month
	Electronic Weighing Machine	NO	0/1	-
	Baby Warmer	YES	9/13	1 month
	Phototherapy unit	YES	2/6	2 weeks – 1 month
	Generators	NO	Working	-

District	Equipments	AMC If available for the Equipment	No of units broken down out of total available (at the time of the visit)	Time taken to get it repaired as reported
GUNA	Non Invasive BP monitors	NO		NA
	Pulse Oximeter	YES	2	1 week
	Suction Machine	NO		NA
	Electronic Weighing Machine	NO		NA
	Baby Warmer	YES	8	1 week
	Phototherapy unit	YES	4	1 week
	Generators	YES		1 day
	Phototherapy unit	YES	4	1 week
	Generators	YES		1 day

Good practices from MP:

AMC was done for crucial equipments like radiant warmers and phototherapy units. There was a provision of spare equipment in the unit for meeting the need in times of breakdown of regularly used equipment.

2-3 local technicians were identified in the district. They were readily available for managing small repairs of the equipments. A good network with AMC agency and local technicians existed for taking care of problems in equipment. Breakdown time for essential equipment varied between one-two weeks, which wass the minimum among all the SCNUs surveyed.

Some contingency funds (Rs 15 lakhs) was earmarked for repair and maintenance for SCNU equipment exclusively by the Civil Surgeon. SCNU In-charge was accountable for this. This process did avoid unnecessary delays and administrative hassles.

Good practice in Assam:
Power audit before installation: *This practice in Assam had pointed out some major faults in the electrical infrastructure. Following were the actions taken:*
1. *A full revamp of electrical drawings was done by the electrical engineers of NRHM with proper guidelines for all aspects of wiring, earthing, power backup (standardization of electrical systems), which increased the cost of the electrical infrastructure that was approved by NRHM.*
2. *Creation of post and appointment of biomedical engineer at the state level to look into aspects of regular maintenance.*
3. *Power audit of all the new SCNU being set up by NRHM across the state before the commissioning of the unit and the problems identified and rectified.*
4. *Provision of quality power in the unit i.e servo stabilizer, 20 KV UPS and 32 KV generator.*
5. *The cable from the transformer to the main panel is made 4 cores instead of 3 and half core as per recommendation of the power audit.*
6. *The third alternative system is made for the critical equipments like oxygen conc, omnifus, syringe pump, pulsemeter and some emergency lightening system making a provision to connecting it to a UPS of 20 KVA.*
7. *The socket of the distribution point is made 5 pinned so that it can accommodate the imported machineries properly and tightly.*

5.7.4 Replacement Cost /Shelf Life

The shelf life of equipments was nearly 6 years. The same was evident at Purulia SCNU, the oldest operational unit which suffered from frequent break downs.

A practice of equipment audit, along with the daily round was carried out by the SCNU incharge at Dibrugarh, wherein the functional status of all the equipments was verified and recorded in an equipment audit register every morning. This helped keep a track of the equipment in need of repair.

A buffer stock of some equipment like baby warmers was there in Guna. This ensured continuity in care even upon breakdown of equipments.

Key highlights

- Having an AMC required an earmarked budgetary allocation towards it, thus ensuring that the complaints are promptly attended to.
- Usually cost of maintenance contract increases as the equipment gets older but if there are a number of equipments from the same source, an economic package maintenance contract may be negotiated for.
- The terms of purchase of equipment may include training of hospital engineers during installation and during the period of free maintenance warranty.
- Having a centralized biomedical engineering to handle the minor repairs, a national level training of the locally selected biomedical engineers must be done to ensure that the minor repairs issues are addressed at local level and this may serve as an economically feasible proposition
- There should be a provision of a buffer stock and spares to ensure continuity in care even on breakdown of equipments.

5.8 Drug Supplies

This was not a major problem in most of the SCNUs as far as supply of essential drugs was concerned. Though, It was noted everywhere that a separate supply for SCNU was lacking and the procurement of drugs was largely dependent on the supply to the pediatrics department. Even the preparations were different. Antibiotics of choice were often not available and had to be bought from outside. This increased the out-of-pocket expenditure.

Supply of disposable items like gloves, IV cannula and needles were usually present but in inadequate amounts. Surprisingly these were not supplied in Vaishali at all. In Purulia, soap for handwashing was procured from patients. Essential drugs like adrenaline and Sodium bicarbonate were available and supplied regularly to all the SCNUs except Dibrugarh, where the drug adrenaline was available but not supplied regularly and sodium bicarbonate was found to be neither available nor supplied. On the other hand the drug nalorphine was found to be available and supplied only in Purulia SCNU. Mayurbhanj SCNU was reported not to have IV fluids available and supplied. Antibiotics were found to be available and supplied to all the SCNUs. However, the antibiotics preferred by the doctors in SCNUs were generally unavailable. More often than not, the supply to SCNUs were from the hospital supply. There were concerns that the required formulations and dosage did not meet the demand.

Table 5.8.1 Supply of essential drugs in SCNUs

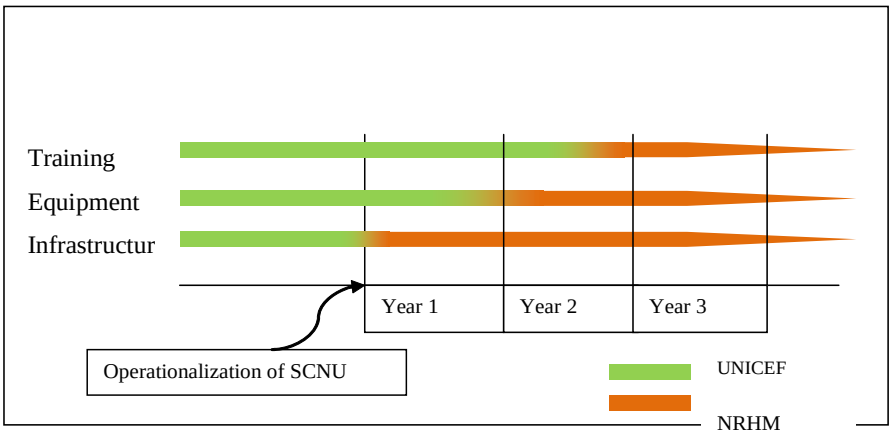
	Adrenaline		Sodium bicarb		Nalorphine		IV fluids		Antibiotics	
	Availability	Regularity	Availability	Regularity	Availability	Regularity	Availability	Regularity	Availability	Regularity
Tonk	Yes	yes	yes	yes	no	NA	yes	yes	yes	yes
Dibrugarh	Yes	yes	no	NA	no		yes	yes	yes	yes
Mayurbhanj	Yes	no	no	NA	no		no		yes	no
Purulia	Yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Lalitpur	Yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Vaishali	No	NA	no	NA	no	NA	no		yes	yes
Guna	Yes	yes	yes	yes	no	NA	yes	yes	yes	yes
Port Blair	Yes	yes	yes	yes	no	NA	yes	yes	yes	yes

There was usually a provision of providing drugs free of cost to people belonging to BPL category. Even if drugs were not available and had to be purchased from outside, the amount was supposed to be reimbursed. But this provision was hardly known to people and the BPL card was normally not produced and often not asked for.

5.9 Mentoring and Training

The SCNUs evaluated were set up primarily by financial support from UNICEF and government and technical assistance from NNF. Financial support to set up the infrastructure, purchase of equipment, provision of salaries to staff (in some places) and training of staff were provided by UNICEF initially. There was a gradual transition and these were handed over to the government. The typical transition looks like the one depicted in fig 5.1.

Fig 5.1 Transition of support from UNICEF to government in SCNUs



The nature and the extent of support rendered by UNICEF varied across the centers depending upon the ability of the state government to support it. For instance, UNICEF supported the establishment of SCNU initially but there was a very quick transition to the government and now it is mainly a government supported unit. The financial support provided for infrastructure, equipment, supplies and salaries of staff are summarized in table 5.9.1. Technical support was provided by UNICEF and NNF since inception. After the units became functional, trainings were mainly supported by both of them. UNICEF had paid supervisory visits both prior to and after the transition. There was a district coordinator of UNICEF at every centre who in coordination with the state representatives not only rendered supervisory support to the units but also monitored their functioning.

Table 5.9.1 Financial support provided at the SCNUs

UNIT	Infrastructure	Equipment	Supplies	Salaries of staff
Tonk	UNICEF	UNICEF	UNICEF	UNICEF, NRHM, RMRS TONK
Dibrugarh	NRHM	UNICEF, NRHM	AMCH	NRHM,State govt
Mayurbhanj	UNICEF/NRHM	UNICEF/NRHM	NRHM	NRHM
Purulia	DOHFW,Govt of WB	DOHFW,Govt of WB, Zila Parishad Purulia, UNICEF Kolkata,AHSD, Purulia Branch, PNB Purulia Branch	Zila Parishad, Purulia for Electric Supply	Dist Health and Family Welfare Samiti, Purulia Zila Parishad, Prurulia, UNICEF, Kolkata
Lalitpur	UNICEF	UNICEF	UNICEF	Till March 09 by UNICEFM after that by Govt through NRHM
Vaishali	Government	UNICEF	Government	Government
Guna	UNICEF	UNICEF	Government	Government of MP and RCH
Port Blair	DHS	DHS	DHS	NRHM

Training was the key activity undertaken during the establishment of SCNUs. Well trained nurses and medical staff form the backbone of the services. It is suggested that the medical and paramedical staff working in an SCNU should undergo:

- An initial training program for 4-5 days and,
- An observer ship at medical college or an equivalent facility for at least two weeks (12 working days)

Most of the staff working during the period of assessment had been imparted practical training though the duration of trainings was variable ranging from a minimum of one day to a maximum of 15 days.. On an average, 90 percent of doctors and 86 percent of nurses were trained across the units. There was no formal refresher training.

It is remarkable that the new born aides and ANMs reported that they were using skills to perform clinical duties in specialized set ups. This is a result of the current practice of gradually shifting tasks to lower cadres in order to address shortages of qualified staff.

Respondents generally felt that their training was useful. Exposure to in-service training was perceived as beneficial in terms of broadening knowledge and learning new techniques. However, many of them expressed a desire to get trained in advance ventilation techniques. Table 5.9.2 gives an account of trainings that have been organized for SCNU staff.

The evaluation covered only the duration of training but assessment of the content and quality of training was beyond the scope of the study. Given the fact that guidelines are not strictly adhered to in terms of duration only, it is felt that a mechanism of monitoring should be established for trainings also.

Table 5.9.2 Year wise training schedule in all the SCNUs

	Year of Training	No. of Trainings	Training Agency	Place of Training	Duration of Training	No of personnel trained / Batch
TONK	2008	2	UNICEF	Safdarjung Hospital, Delhi	7 days	2 Paediatricians
			UNICEF	Distt Hosp, Tonk	7 days	Sister Incharge and 1 staff nurse
	2009	1	Director RCH Jaipur	J.L.N Medical college, Ajmer	4 days	1 Paediatrician, 1 Head urse Incharge, 1 Staff Nurse
DIBRUGARH	2009	2	UNICEF	Dibrugarh	2 days	GNMs
			NNF	New Delhi	2 days	Paediatricians
MAYURBHANJ	2007	1	UNICEF	Baripada	4 days	SCNU Incharge, Sister Incharge, 6 out of 9 SNs
PURULIA	2008	1		Mumbai	3 Months	SCNU Incharge
	2009	1		SSKM Hospital, Kolkata	14 days	All staff nurses, the entire newly recruited batch
LALITPUR	2008	1	NNF	DFH- Lalitpur	4 days	Pediatiricians, Staff Nurses
VAISHALI	2008	1	UNICEF	Kalawati Saran, Delhi	15 days	2 Paediatricians, 4 M.Os, Sister Incharge, 3 Staff nurses, 7 ANMs, 4 ANM Tutors
	2009	1	UNICEF	SCNU Hajipur, Vaishali	1 day	4 Paediatricians, 1 Medical officer, 1 Sister Incharge, 3 Staff Nurses, 5 ANMs
GUNA	2008	2	UNICEF	Pvt corporate Hospital, Rainbow children hospital	7 days	3 Paediatricians,1 Sister Incharge
			AIIMS	AIIMS, Delhi	4 days	1 Paediatrician, ANMs
	2009	4	NNF	Gwalior SCNU	4 days	1 Paediatrician
			NNF	Shivpuri SCNU	4 days	1 Paediatrician
			NNF	PGI Chandigarh	3 days	1 Paediatrician
			RCH	Gwalior Medical college	2 days	1Paediatrician

The SCNUs have also played the role of a training centre for staff of other SCNUs that were established in the state. Most of the trainings were supported by the government with technical support from UNICEF and NNF.

Table 5.9.3 Role of UNICEF as a training centre

	Year of Training	No. of Trainings	Category of Staff Trained	Duration of Training	Nature of Training - Observership / Practical	Batches	No of personnel trained / Batch	Trainer
TONK	2008	1	Peripheral Medical officers, ANMs , GNMs and Staff Nurses posted in periphery Staff	1 day	Observership			
	2009	1	Medical officers, ANMs , GNMs and Staff Nurses posted in periphery Peripheral Staff	1 day	Observership			
DIBRUGARH	2009	6	Medical officers	1 Week and 6 Weeks	Observership			NRHM
			Medical officers	3 days	Observership	4 batches in total		UNICEF
			GNMs					
			GNMs	1 Week	Observership			NRHM
			Private Nurses from Digboi IOC Hospital	15 days	Observership			IOC
MAYURBHANJ	2008	1	Medical officers : of Koraput DHH, Jayapore SDH, Capital Hospital, BSBR and Staff Nurses of Koraput and Capital Hospital Medical officers and Staff Nurses	4 days	Practical	Medical officers: 3 batches with 2 Medical officers in each , Staff Nurses: 3 batches with 4 Staff Nurses in each	6 Medical officers and 12 Staff nurses	UNICEF
PURULIA	2008	1	NSUs of Purulia Staff Nurses	5 days, 9 batches	Practical and Observership	9 batches	38 Staff Nurses of NSUs operational at block level	Dept of Health and Family welfare, Purulia
LALITPUR	2008	1	JE from other Districts	4 hrs	Observership			JE Distt Female Hospital , Lalitpur
	2009	1	Medical officers and ANMs from other Districts and FRUs	2-3 hrs	Observership		?	State and District Trainers
VAISHALI	2008	2	Medical officers and ANMs	1 day	Observership		4 Medical officers, 6 ANMs	

5.10 Record keeping

Data management has a pivotal role to play in public health. Its potential was realized since inception of SCNU and hence record keeping has been given a lot of emphasis. This was facilitated by UNICEF in all the centres in the beginning and is still being supported. Following table summarizes the scenario.

Table 5.10.1 Status of record keeping in SCNUs

	Computer	Computer stationed in SCNU premises	Data entry operator	Support of Data entry operator	Monthly report generated	Details of every case Obtained
Tonk	X	NA	X	NA	√	X
Dibrugarh	√	√	√	UNICEF	√	X
Mayurbhanj	√	X	X	NA	√	X
Purulia	√	√	√	UNICEF	√	√
Vaishali	√	√	√	UNICEF	√	√
Lalitpur	√, not functional	√	X	NA	√	X
Guna	√	√	√	UNICEF	√	√
Port Blair	√	√	√	NRHM	√	√

Monthly reports were generated and submitted to civil surgeon or chief medical officer of the district by the SCNU-in-charge. These records were shared with the research team. However, there was no uniformity in the data recorded. The SCNU staff of many places felt that a format with essential information should be generated and staff should be imparted training for better monitoring. Besides, a mechanism to transmit data as in place in the NSUs. In Purulia and Guna, for instances, these were routinely submitted to the respective district heads, while in other areas, it was found to be evolving. A simple and feasible mechanism to track down cases discharged from SCNUs was available at Guna. This computer based system was utilized by the staff to ascertain the due data of follow up of the neonates till the age of one year.

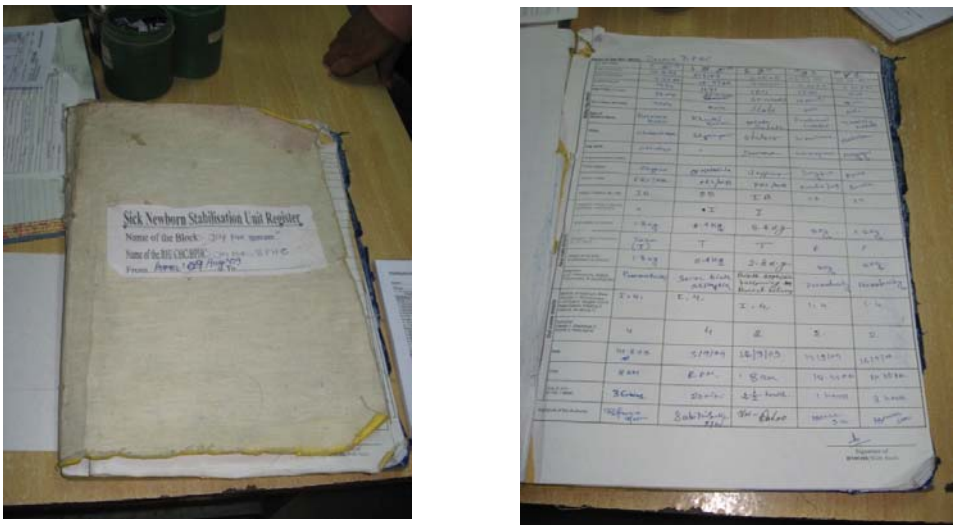


Plate 5.22 Records maintained at NSU and transmitted to SCNU in Purulia

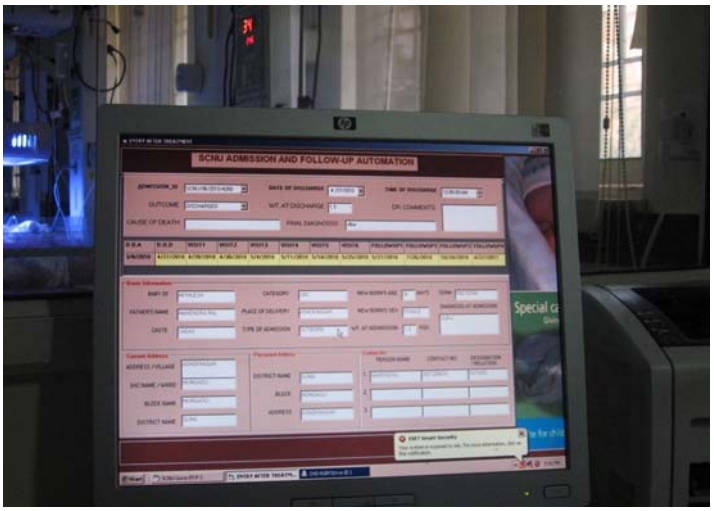


Plate 5.23 Record keeping in Guna

5.11 Follow up

Follow up visits following discharge of babies gives an opportunity to track cases. Follow up component was generally found to be weak barring Port Blair and Purulia. Most of the units did not have a follow up protocol in place and hence it was difficult to comment on how many babies actually turned for follow up. Moreover, in the absence of a follow up room, they used to go to general pediatric ward OPDs for which no records were maintained separately.

Table 5.11.1 Follow up component in SCNUs

	Protocol	Designated space for FU	Estimated FU rate after discharge	Remarks
Tonk	Nothing specific	No	< 10% reported	Generally come to OPD, difficulty to keep track
Dibrugarh	Nothing specific	No	No estimate	-
Mayurbhanj	Nothing specific	No	No estimate	FU advised but compliance uncertain
Purulia	FU advised every 6 weeks till 6 months of age	Exists within SCNU premises	80% reported to come for 1st FU	No specific day. FU done by doctors on duty at SCNU
Lalitpur	No	No	--	
Vaishali	No	No	-	
Guna	FU advised after 3 days of discharge	Exists within SCNU premises	< 10% reported	Timings specified for FU OPD in mornings and can come anytime to SCNU
Port Blair	FU advised after 3 days of discharge	Exists near SCNU	>90% reported	Timings specified (Tuesday- Friday : 9-11 AM)

Because there was no uniform protocol, units had their own systems in place. In some areas, babies were sometimes shown to doctors in their private clinics. It was therefore difficult to comment on the actual FU rate.

Plate 5.24 Follow up in Guna

Plate 5.25 Follow up in Port Blair

5.12 Performance Indicators

5.12.1 Hospital Delivery Data

The total number of deliveries had increased manifolds after Janani Suraksha Yojana came into being. Table 5.12.1 gives the district hospital wise distribution of the occurrence of deliveries in the year 2008 and 2009.

Table 5.12.1 Year wise occurrence of deliveries in district hospital

District	Total No of Deliveries	
	2008	2009
Tonk	5366	4775
Dibrugarh	6147	6945
Mayurbhanj	6582	5781
Purulia	8453	9057
Lalitpur	-	5560
Vaishali	8623	9885
Guna	8475	7807
Port Blair	2769	2109

Year wise occurrence of caesarean section deliveries revealed that the rate of caesarean section was considerably higher in Dibrugarh and Port Blair owing probably to their being tertiary centres. This rate was reported to be minimum in Vaishali followed by Guna. The average rate of still birth varied from 1.6 in Tonk to 5.4 / 100 deliveries in Purulia and Dibrugarh. The low birth eight rate on an average was around 20-30% in the centres.

Table 5.12.2 Yearwise occurrence of caesarean-section deliveries

District	2008	2009
Tonk	8.9	13.2
Dibrugarh	37.5	35.1
Mayurbhanj	16.0	16.9
Purulia	17.6	15.5
Lalitpur	-	2.4
Vaishali	0.2	0.4
Guna	2.9	3.7
Port Blair	25.5	34.6

Table 5.12.3 Yearwise occurrence of still births

District	2008	2009
Tonk	1.8	1.3
Dibrugarh	4.7	5.8
Mayurbhanj	NA	6.0
Purulia	4.9	5.6
Lalitpur	NA	NA
Vaishali	1.9	2.3
Guna	3.3	2.8
Port Blair	2.7	2.8

Table 5.12.4 Prevalence of low birth weight rate among babies delivered in district hospitals

District	2008	2009
Tonk	10.5	18.0
Dibrugarh	24.6	28.5
Mayurbhanj	NA	NA
Purulia	20.9	28.4
Lalitpur	-	8.6
Vaishali	NA	NA
Guna	NA	NA
Port Blair	30.7	34.1

5.12.2 Admission rate

The average number of admissions in each SCNU had increased since inception. It had increased from 3.6 to 19.5 for every 100 deliveries over a period of 4 years (table 5.12.6). The proportion of SCNU admissions to the total deliveries taking place in the district hospital was approximately 20% except in Purulia and Vaishali. The proportion showed an upward trend across all SCNUs.

Admission rates in most of the units exceeded 15% with the exception of Purulia and Vaishali where it was around 4%. Purulia SCNU followed a very stringent criteria to admit a neonate. If a neonate was admitted in the pediatric ward for more than 48 hours, or the baby had shared the bed with anyone while in the pediatric ward, the baby was denied admission despite availability of beds. A critical observation was that in none of the SCNUs except Purulia, neonates were admitted to pediatric wards. It was therefore important to analyse the outcome of admission of neonates in pediatric wards. But this unfortunately was beyond the scope of the study. In Vaishali, on the other hand, admission to private clinics was the preferred option.

Table 5.12.5 Year wise total admissions in SCNUs

	2008	2009 (Till Sept)
Tonk	1315	1222
Dibrugarh	1502	1357
Mayurbhanj	1425	1283
Purulia	413	286
Lalitpur	211	677
Vaishali	414	226
Guna	1762	1597
Port Blair	713	624
Total	7755	7272

Table 5.12.6Year wise admission per 100 deliveries in SCNUs

	2008	2009
Tonk	24.5	34.0
Dibrugarh	24.4	26.0
Mayurbhanj	21.6	28.9
Purulia	4.9	4.1
Lalitpur		15.8
Vaishali	4.8	4.2
Guna	20.8	27.2
Port Blair	25.7	39.3
Total	16.7	19.5

Plate 5.26 A baby under phototherapy in pediatrics ward in Purulia

Out of total admissions almost 10% of the admissions took place at night (9 PM- 5 AM) as observed.in these visits, where the time of admission was recorded routinely. Majority of the neonates admitted to SCNUs were males. Increased susceptibility to morbidities was seen generally in males as compared to females, which could probably explain this. Besides, gender bias and a general preference of the community to provide better care to males also played an underlying role. During a visit to Tonk SCNU by the research team, out of 10 odd admissions, 9 were males. Interactions with field workers and doctors and nurses, it became apparent that people did prefer better care provision for male babies. This was noted particularly in Vaishali, lalitpur and Tonk. But after they reached SCNUs, this discrimination was usually not there (fig 5.2).

Inborn cases formed the bulk of admissions in all the SCNUs, though the proportions varied. This can be explained partly by the increase in the number of institutional deliveries. For outborn cases there is always a probability of attending private clinics or getting admitted in other government hospitals (fig 5.3).

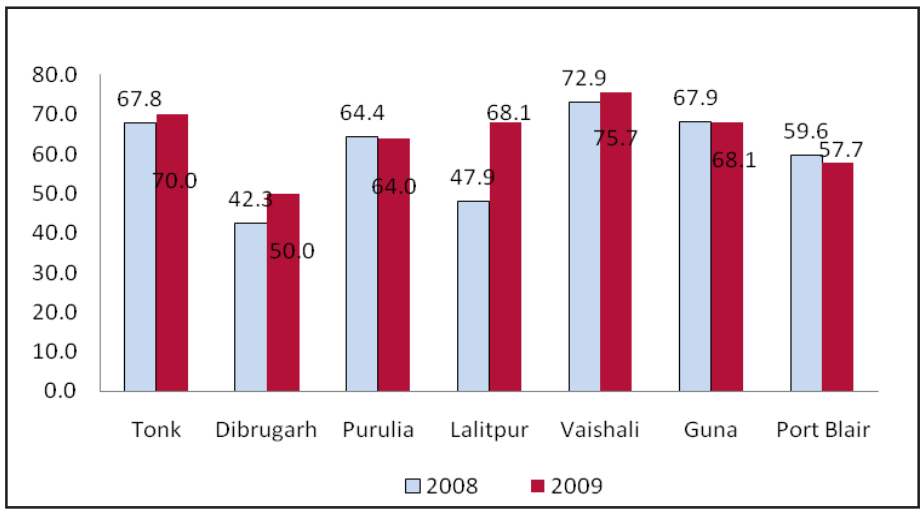


Fig 5.2 Proportion of male admissions to total admissions across SCNUs

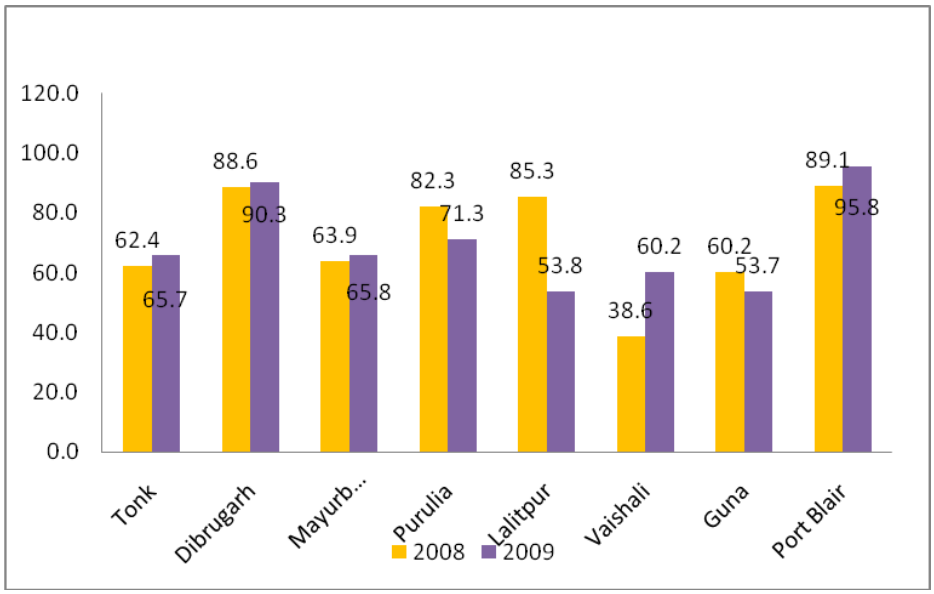


Fig 5.3 Proportion of inborn cases per 100 admissions

Table 5.12.7 Year wise proportion of cases with different low birth weight categories (as proportion of total admission for each unit and each year)

	cases with birth wt between 1500-2499 gms				cases with birth wt between 1000-1499 gms				cases with birth wt <1000gms			
	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
Tonk			42.1	44.2			10.8	10.3			0.5	0.8
Dibrugarh			38.4	40.6			8.5	8.0			1.5	1.1
Mayurbhanj		40.7	38.5	27.9		0.2	9.3	0.0		1.9	2.1	2.5
Purulia	44.8	46.1	46.2	44.8	15.5	0.1	5.1	4.5	2.1	1.5	0.5	0.0
Vaishali			22.5	22.6			7.2	9.7			1.0	1.3
Guna		46.0	45.5	45.5		0.2	9.5	10.6		1.6	0.6	1.5
Port Blair	36.8	40.3	43.8	31.7	7.6	0.1	7.6	5.8	0.0	0.0	0.0	0.0
Total *	***40.0***	***41.7***	***39.7***	***35.1***	***26.6***	***0.1***	***8.7***	***6.5***	***0.9***	***1.2***	***1.0***	***1.2***

**Lalitpur was excluded from the analysis since birth weight was not documented in 40% of the cases admitted*

Babies with birth weight between 1500-2499 grams contributed to approximately 40% of the total admission load. However, bulk of the admissions was contributed by babies whose birth weight was more than 2500 grams in Dibrugarh, Mayurbhanj, Vaishali and Port Blair SCNUs. These facts could be reiterated by the analysis of inborn admissions in the last 12 months.

Table 5.12.8 Cases with birth weight between 1500-2599 gms (as proportion of inborn and outborn admissions respectively for 2008 and 2009)

District	2008		2009	
	Inborn	Outborn	Inborn	Outborn
Tonk	42.6	41.2	44.8	43.0
Dibrugarh	43.1	27.8	40.7	40.2
Mayurbhanj	60.3	NA	42.4	NA
Purulia	44.7	53.4	44.1	47.5
Vaishali	58.1	NA	37.5	NA
Guna	41.9	50.9	45.6	45.5
Port Blair	49.1	NA	36.3	NA

Table 5.12.9 Year wise admission of VLBW (<1500 grams) babies

	Cases with birth weight < 1500g (as a proportion of total admissions)			
	2006	2007	2008	2009
Tonk			11.3	11.1
Dibrugarh			10.0	9.1
Mayurbhanj		19.5	11.4	2.5
Purulia	17.6	14.9	5.6	4.5
Vaishali			8.2	11
Guna		20.6	10.1	12.1
Port Blair	7.6	10.0	7.6	5.8
Total	*27.5*	*15.4*	*10.0*	*8.5*

Admissions of very low birth weight (VLBW) babies showed a lot of variation. As per the NNF guidelines, VLBW babies should be transferred to level III facility. In the districts these SCNUs performed better than other level II/III units existing in the state. These districts were often located far from the state capitals where hospitals with better facilities existed. Moreover, keeping in mind the constraints of money, transport and distance, most families preferred SCNU rather than transfer to other units. It should also be considered that the rate of admission of VLBW babies and their outcomes form the key parameters to assess the functioning of a level II unit.

5.12.3 Morbidity profile

The three major causes of morbidity were asphyxia, low birth weight, prematurity and sepsis. Considerable variation existed in the proportion of these causes of morbidity across the SCNUs. It was noticed that asphyxia was the most common cause of morbidity in all the SCNU admissions. Sepsis, low birth weight and jaundice were found to be second most common causes amongst all, while respiratory distress was next to follow (fig 5.4).

Table 5.12.10 Year wise morbidity profile of the admissions

	Respiratory Distress	Sepsis	LBW/PM	Asphyxia	Congenital Malfunctioning	Jaundice	Others
2008	10 %	18%	17%	21%	2%	18%	14%
2009	9%	18%	18%	20%	1%	18%	16%

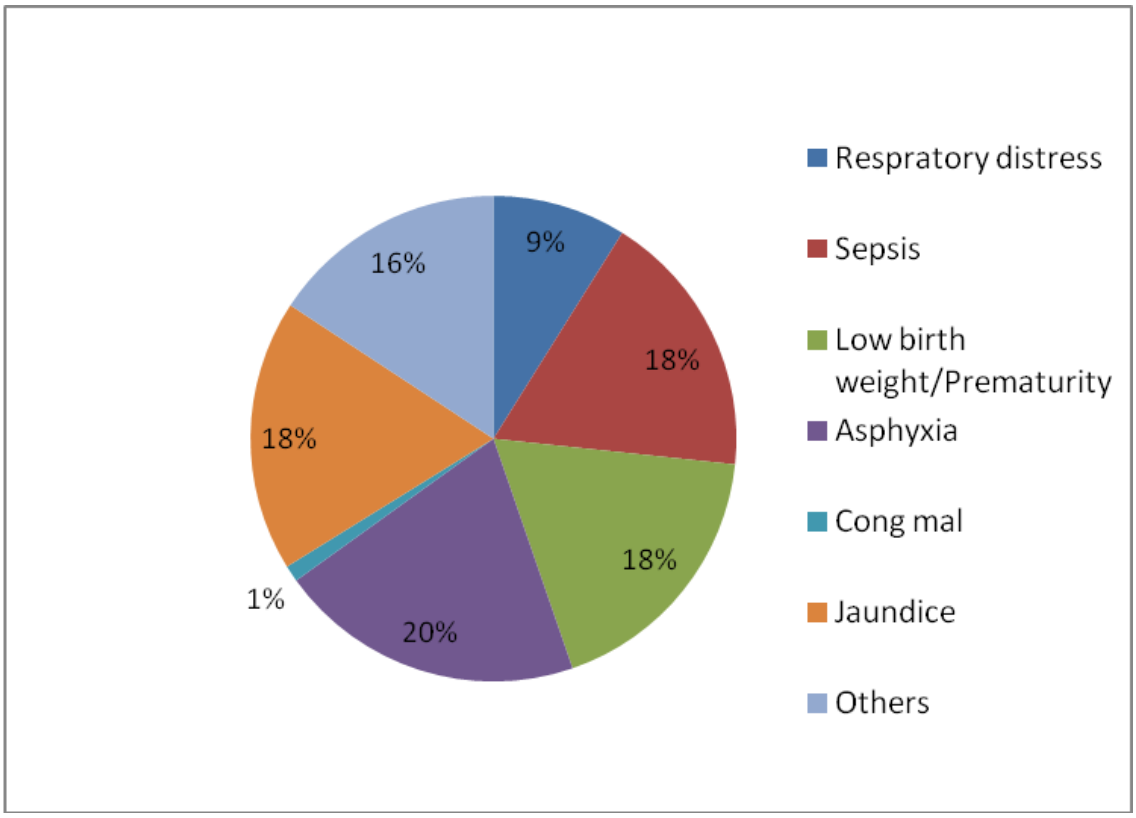


Fig 5.4 Morbidity profile of admissions in 2009

Though respiratory distress turned out to be a common cause in Tonk, Vaishali, and Port Blair, it did not figure in the list of morbidities in Mayurbhanj and Purulia. Similarly jaundice was not reported in Lalitpur district. Congenital malformation was found to be least common amongst all causes. This was primarily due to lack of clarity on the case definition of morbidities to be reported. A comparison of causes of morbidity and mortality in SCNUs should be done keeping this factor in mind. However, analysis of the burden at each unit over a time period was justified since the reporting of each condition was likely to be uniform. This was partly owing to the fact that the turn over of doctors was less in these units who were primarily responsible for assigning a diagnosis (table 5.12.1).

Table 5.12.11 District wise morbidity profile of the admissions in SCNUs during 2009

	Respiratory Distress	Sepsis	LBW/PM	Asphyxia	Congenital Malformation	Jaundice	Others
Tonk	18%	16%	13%	14%	2%	9%	28%
Dibrugarh	9%	13%	20%	13%	1%	39%	5%
Mayurbhanj	0	14%	26%	37%	0	6%	17%
Purulia	0	32%	20%	32%	2%	12%	2%
Lalitpur	9%	32%	8%	13%	0	0	38%
Vaishali	32%	13%	22%	19%	0	1%	13%
Guna	6%	26%	10%	29%	3%	7%	19%
Port Blair	18%	16%	13%	14%	2%	9%	28%

5.12.4 Outcomes of admissions

There was a drop in the case fatality rate (CFR) out of the total admissions in the first year of the functioning in all SCNUs except Lalitpur and Dibrugarh. A rise in mortality after 2 years was seen in Mayurbhanj. The decrease in CFR in 1 year ranged from 4- 40%. The rise in CFR in Lalitpur could probably be explained by the number of nurses that was halved abruptly. Several other factors could contribute like following aseptic practices, admission load assessed by bed occupancy rate, average length of stay, adequacy of doctors and nurses that have been dealt with separately.

Proportion of babies leaving against medical advice (LAMA) had shown a decline in most of the units: in 2009, it ranged from 0% to 10.5%. Readmission was not assessed as a part of the evaluation. But interviews with mothers at the time of the visit indicated that readmission might be a concern in some of the units.

Table 5.12.12 Outcome of admissions to SCNUs (LAMA and mortality indicators)

	LAMA rate per 100 admissions				Case fatality rate per 100 admissions			
	2006	2007	2008	2009	2006	2007	2008	2009
Tonk			0.8	0.5			7.4	7.0
Dibrugarh			11.7	10.5			5.9	7.9
Mayurbhanj		3.8	2.5	3.1		17.2	12.3	15.7
Purulia	1.8	0.6	1.7	3.8	25.8	9.6	6.8	7.3
Lalitpur			0.9	1.5			16.6	18.1
Vaishali			5.6	6.2			21.7	12.4
Guna		3.2	5.2	4.4		20.6	13.8	12.0
Port Blair	0.0	0.0	0.0	0.0		9.2	7.7	7.1

There had been a decline in CFR in the first year of the functioning of seven out of eight SCNUs surveyed. The decline in the first year of operations ranged from 4- 40%. There was however a reversal in trend observed in 3 out of 4 units after 2 years of functioning. Table 5.12.13 gives the change in the mortality rate relative to itself. The declining trend in CFR since the time of inception was significant for Purulia and Guna. In the year 2009, the CFR ranged from 7 percent to 18 percent in these units. Fig 5.5 gives an idea of the combined fatality plus LAMA rate in the SCNUs.

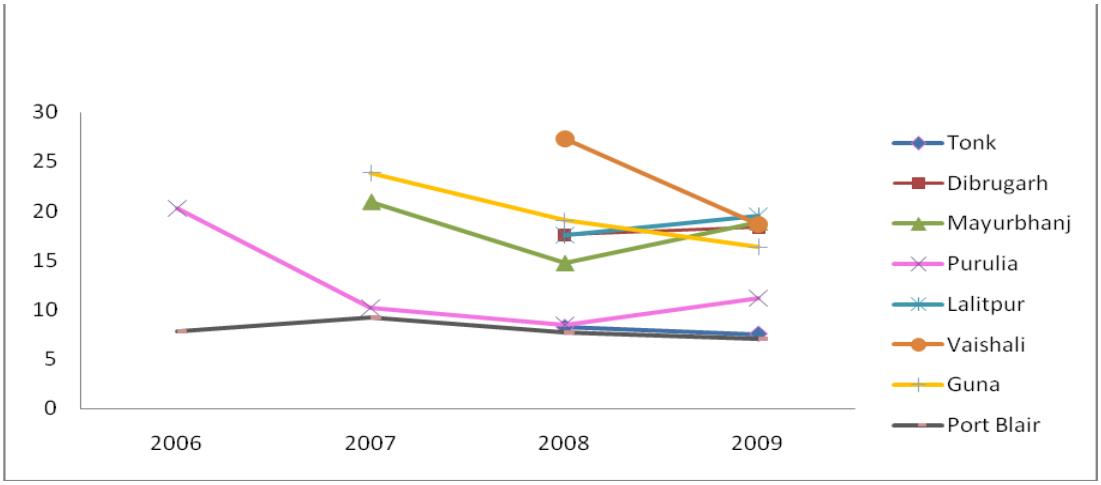


Fig 5.5 Combined Fatality and LAMA rate across SCNUs per 100 admissions

Table 5.12.13 Decline in case fatality rate in SCNUs after becoming functional

	After 1st year of functioning	After 2nd year of functioning	Chi-square for linear trend in NMR (p value)
Tonk	4.5%	-*	-
Dibrugarh	-35.0%	-*	-
Mayurbhanj	28.4%	-28.1%	0.18 (p= 0.67; df=2)
Purulia	48.1%	29.3%	24.3 (p<0.001, df=3)
Lalitpur	-8.6%	-*	-
Vaishali	43.0%	-*	-
Guna	13.6%	-13.9%	4.71 (p=0.03, df=2)
Port Blair	16.2%	-0.07%	2.01 (p=0.15, df=2)

*NA- not applicable

Table 5.12.14 shows the cause specific mortality due to major causes. This is the data compiled from seven units excluding Lalitpur. This was again based on the figures reported by the respective units. However, an inherent problem due to lack of uniform case definitions and reporting must be considered. In 2009, asphyxia (15.8%), sepsis (9.6%),low birth weight / prematurity (6.3%) and congenital malformation (13.7) remain the major causes of mortality in the units.

Cause specific mortality rate was calculated by dividing the total deaths due to a condition as a proportion of total admissions due to that particular condition. Patients admitted with specific morbidities from Lalitpur were excluded since cause specific deaths were not available from that unit. Analysis of cause specific mortality in each unit revealed that mortality due to sepsis, birth asphyxia, and low birth weight has decreased.

Proportional mortality rate (PMR) was calculated as the number of deaths resulting from a particular condition as a proportion to the total deaths. It was found that PMR due to sepsis and low birth weight has decreased, while that due to asphyxia has remained unchanged. The decline was significant for sepsis (chi square= 6.32, p=0.01) and low birth weight/ prematurity (chi square= 4.47, p= 0.03) while the rise for asphyxia was not statistically significant (chi square= 0.47, p=0.49). Unit wise analysis gave a better picture since the possibility of a bias was limited owing to very little turnover of doctors and hence inter-observer variation was likely to be less (fig 5.6). Figures 5.7 to 5.9 give the PMR in different units.

Table 5.12.14 Yearwise cause specific mortality rate of seven units combined

	2008	2009
Sepsis	13.1%	9.6%
Birth asphyxia	16.7%	15.8%
Low birth weight/ prematurity	10.6%	6.3%
Congenital malformation	16.1%	13.7%

* Lalitpur was excluded since data was not available.

Feedback from various SCNUs indicated that these units had brought down the fatality rates due to low birth weight and sepsis. In many instances, proportion of VLBW babies actually determines the outcome of a unit. Experiences from Mayurbhanj indicated that mortality rate due to LBW had come down but that due to VLBW had shown a modest decline.

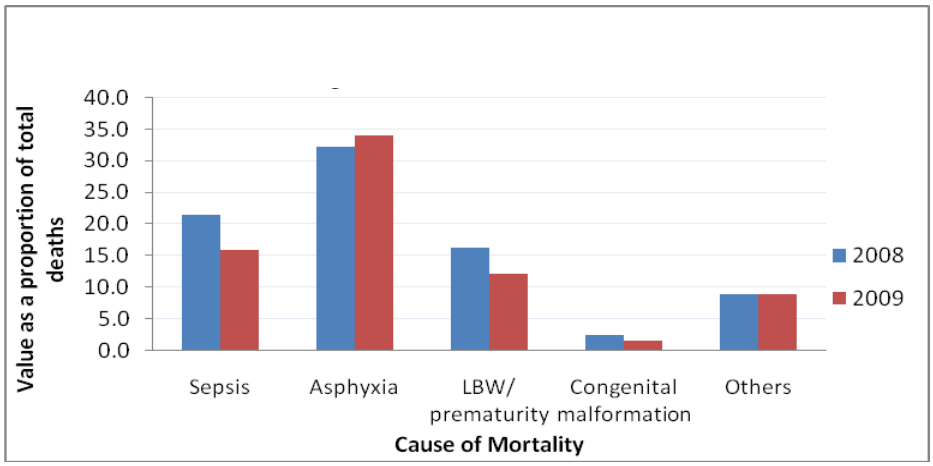


Fig 5.6 Proportional mortality rate due to sepsis, asphyxia and low birth weight for all the units in 2008 and 2009

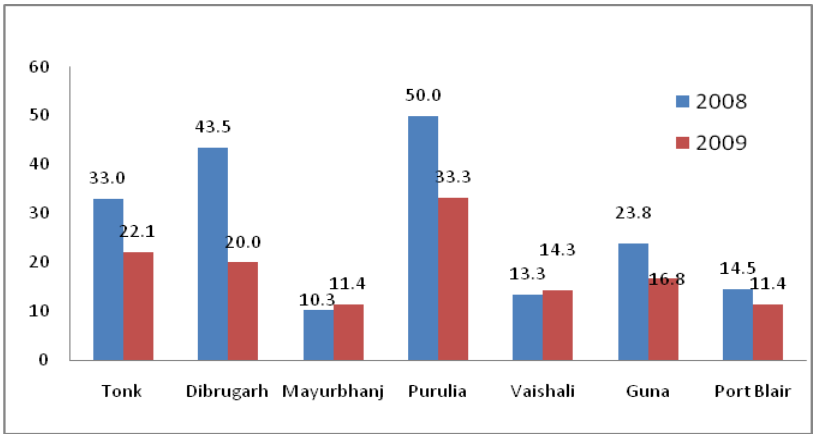


Fig 5.7 Proportional mortality rate due to sepsis

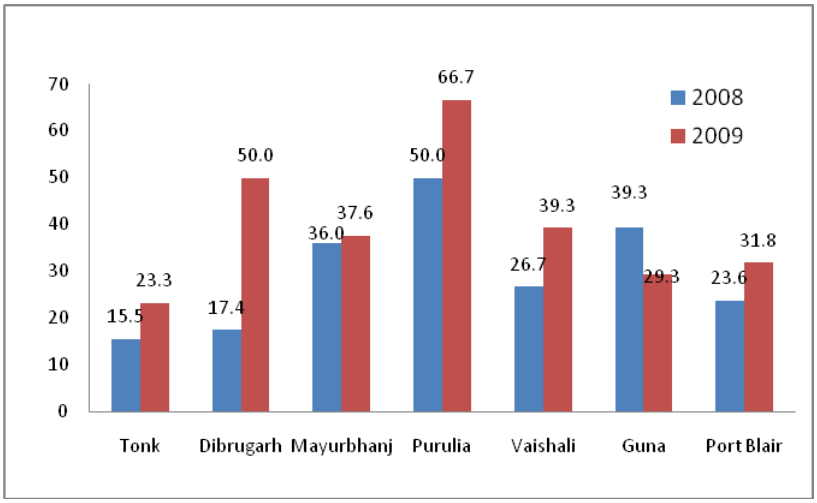


Fig 5.8 Proportional mortality rate due to asphyxia

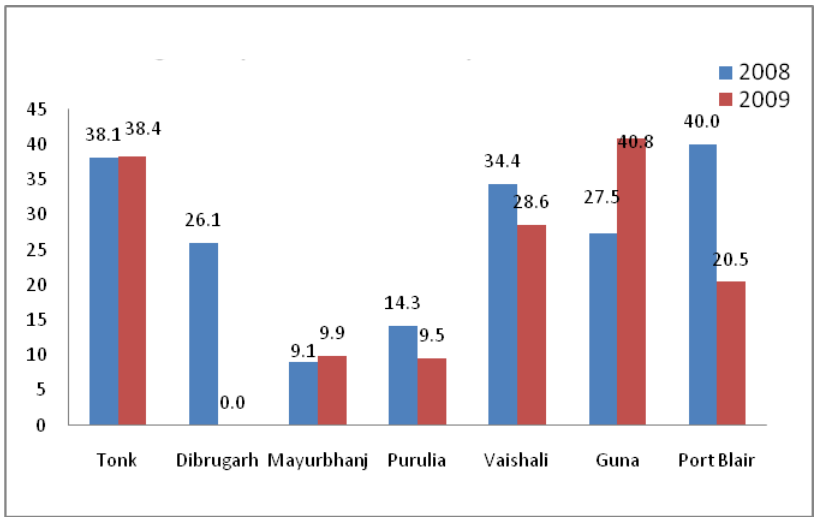


Fig 5.9 Proportional mortality rate due to low birth weight

5.12.5 Factors influencing performance of a unit

Performance of a unit is generally evaluated in terms of morbidity and mortality indicators. Quality of care was not evaluated in the strict sense as part of the study. However, some of the surrogate markers that could indicate the quality of care have been studied. Quality of care will affect the outcome of admission in terms of average length of stay for each illness that the neonates are admitted with, and mortality. Morbidity is very difficult to quantify owing to lack of standard case definitions and different reporting units and formats. The most accurate and objective criterion was 'Case Fatality Rate among admitted neonates' since all the units had exact number of admissions and deaths recorded. In our analysis, we considered CFR among admitted cases as the primary outcome.

5.12.5.1 Average length of stay (ALOS) and bed occupancy rate (BOR)

This is a parameter which influences quality of care. It is dependent to a large extent on the admission load, demand for empty beds and profile of babies admitted to SCNUs. Bed occupancy rate is another indicator which can assess the burden on the nurses since each baby requiring admission in SCNU would need attention. Clearly, if a pressure to admit more babies is there, there is a probability of discharging babies prematurely. Readmission rate in this situation is likely to go up. Though this was not captured by the study, some evidence was there regarding readmissions. In Mayurbhanj, out of 5 beneficiaries who were picked up randomly during the visit, 3 turned out to be cases of readmission. Similarly 2 out of 5 were readmissions in Lalitpur.

Average length of stay was calculated by dividing the total number of days of stay in hospital for 2 months (August and November 2009) by all neonates by number of neonates admitted during the same time period.

Plate 5.27 Overcrowding of newborns under phototherapy unit in one SCNU

Table 5.12.15 Average length of stay and bed occupancy rate in SCNUs

SCNU	Average length of stay (in days)	Bed Occupancy Rate
Tonk	5.1	106%
Dibrugarh	4.4	137%
Mayurbahnj	4	155.3%
Purulia	15	100%
Lalitpur	3.4	52%
Vaishali	2.2	28.1%
Guna	5.5	130%
Port Blair	5.6	96%

It is generally believed that the average length of stay for a SCNU would be between 5-7 days. The ALOS for preterm babies or VLBW babies is usually long and the proportion of LBW babies affects the average ALOS. It looked quite skewed here since it ranged between 2 to 15 days. Increased admission overload also gave rise to sharing of beds often by 2-3 babies which was a risk. This was a common observation in Mayurbhanj and Guna. Chances of acquiring infection increases manifold with sharing of beds. An association was found out between ALOS and CFR that showed that around

Figures 5.10 and 5.11 show an association between Average length of stay and CFR. More than 22% of the variation in CFR could be attributed to ALOS.

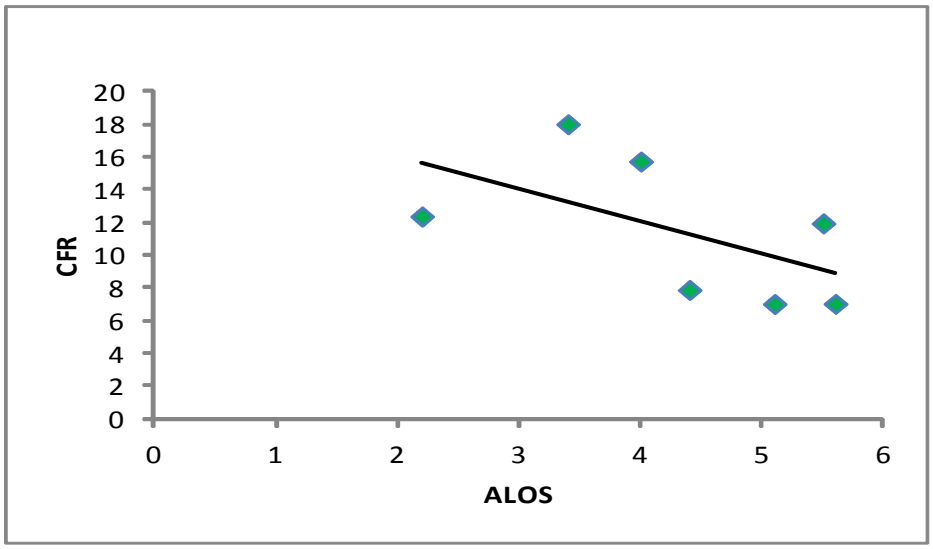


Fig 5.10 Association between CFR and ALOS excluding Purulia

30% of the variation in CFR could be explained by ALOS. Data from Purulia was excluded considering that ALOS of 15 days was highly skewed.

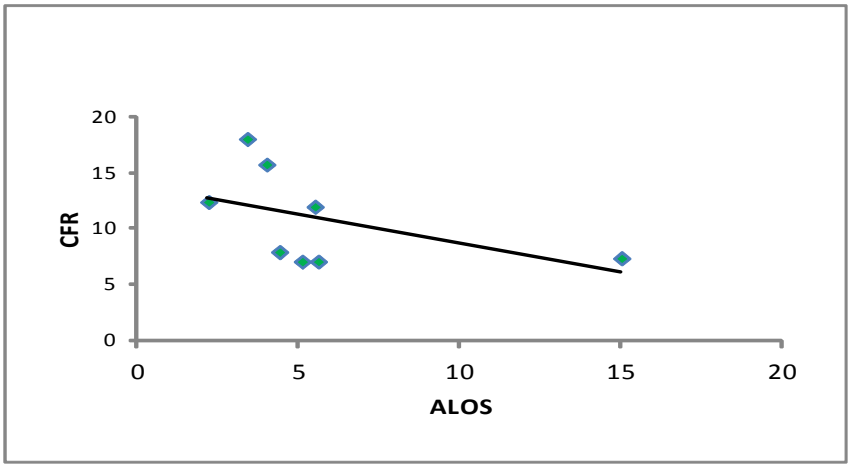


Fig 5.11 Association between CFR and ALOS including Purulia

5.12.5.2 Aseptic practices in SCNU

It is a well established and documented fact known to influence quality of care in hospital based setting, and more so in intensive care units. A composite indicator was developed to measure these practices objectively.

Table 5.12.16 Aseptic practices followed in SCNUs

	Tonk	Dibrugarh	Mayurbhanj	Purulia	Lalitpur	Vaishali	Guna	Portblair
24 hrs running water*	√	√		√	√	√	√	√
Elbow operated wash basin	√	√	√	√	√	√		√
Availability of soap	√	√	√	√	√	√	√	√
Practice of Hand washing before entering SCNU*		√		√			√	√
Practice of Hand washing after touching every baby*								
Practice of wearing gowns in the SCNU		√		√			√	√
Practice of wearing slippers in the SCNU	√	√	√	√	√	√	√	√
Practice of mask and caps in the SCNU				√				√
Total score (out of 11)	5	8	3	9	5	5	7	9

* Essential criteria= score-2, rest=score-1

The parameters included in the indicators were based on the observations made by the research team at the time of visit. To overcome a possible bias, the information was triangulated with the

feedback obtained from the beneficiaries during the community visit. At least 4 beneficiaries were interviewed from each district. The mothers were encouraged to narrate the instructions given before entering the SCNU and their adherence to those instructions. Interestingly, the mothers at Purulia and Port Blair could speak about the aseptic measures explicitly. Not only that, they even expressed that those practices continued even after they were discharged from the hospital. They appreciated the importance of following these measures meticulously.

What emerges from this is that a good communication channel must exist between mothers/ attendants and doctors/ nurses. The importance of asepsis must not only be explained but demonstrated by actually following them.

A strong association between the aseptic measure followed and CFR was seen and it was observed that there was an inverse relationship between the two. As much as 50% of the variation seen in the mortality could be attributed to aseptic measures being followed.

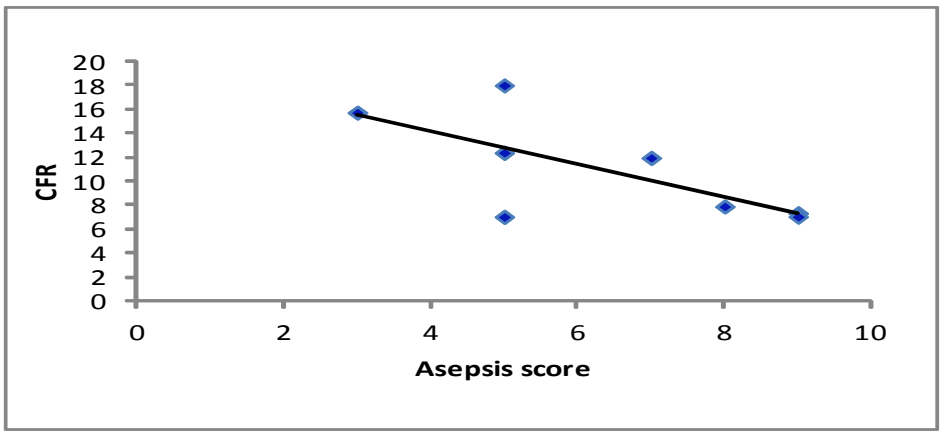


Fig 5.12 Association between CFR and asepsis practices

5.12.5.3 Number of nurses

Number of nursing staff is a critical parameter to ensure quality of care. The number of beds per nurse has been elaborated in many publications. The ideal ratio for a special care unit is 1.2:1. With increased beds: nurse ratio, handwashing practices also get compromised to a great extent directly influencing the quality of care.

Around 14% of the variation in NMR could be explained by number of nurses. This figure remained unchanged when the total number of nurses was adjusted based on their qualification. Interestingly, CFR did not seem to be correlated with the number of doctors.

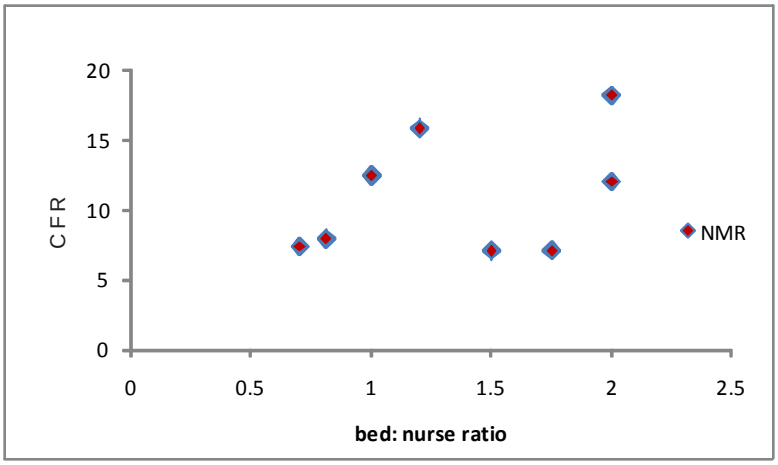


Fig 5.13 Association between CFR among admitted babies and bed:nurse ratio

5.12.5.4 Average time to repair equipments:

Average time taken to repair the essential equipments is a determinant of quality of care. Of all the essential equipments, baby warmers and phototherapy units are the most important ones. Although the research team could not determine the exact time that each SCNU takes to repair these, the SCNU head and nurse-in-charge mentioned about the approximate time taken. There seemed to be no difference in time taken based on the AMC status.

5.12.5.5 Number of beds

It is essential to have an optimal number of beds for neonatal units since the investment that goes into setting up and running the units including essential and ancillary costs are intimately related to the number of beds that each unit requires.

If this is less than the required number, neonates who might benefit from special care may be denied access or quality of care will get compromised due to admission overload and twin sharing of beds. On the other hand, setting up a SCNU is expensive and many of the costs remain fixed even when SCNU functions below its full capacity. It is therefore, equally important that provision of beds is not excessive.

The number of beds was calculated before when institutional deliveries were much less. Now that it had increased, the number needs to be looked into. We recalculated the number using the presumptions used by NNF (table 5.12.17).

Table 5.12.17 Availability of beds at SCNUs

	Existing number of beds	NNF*	NNF formulae with data from study**
Tonk	12	20	33
Dibrugarh	17	23	25
Mayurbhanj	12	25	27
Purulia	14	32	19
Lalitpur	12	25	13
Vaishali	13	32	3
Guna	20	32	45
Port Blair	14	10	22

* 15% of deliveries would require special care, average length of stay= 7 days, plus 30% extramural.The current number of deliveries were considered

**current number of deliveries, average length of stay revealed from the present study were considered.

5.13 Results- Care provider's perspective

The special care new born unit model is a facility based service delivery model, where the quality of services rendered is a function of the human resource involved in the care provisioning. The care providers mainly, the SCNU-in-charge managing the unit and SCNU doctors and nurses are the ones in direct interface with the community as well as the hospital administration. These units were under an evolutionary process when the assessment was undertaken. Thus, capturing the perspectives and experiences of the care providers per se helped us understand the constraints they had to operate under, their understanding of the community and their problems, further support they sought and suggestions they had to offer for improvising the model further.

In order to understand the perspective of the health care providers, the SCNU in-charge, 2 doctors managing the unit and 2 nurses (including the head nurse) were interviewed. In addition, informal interactions were held with the program officers and Civil Surgeons wherever possible. This section reflects the viewpoints of 18 doctors and 16 nurses from the SCNUs visited.

5.13.1 Utility of the model

The care providers shared a positive perception about the importance and utility of the special care newborn unit initiative both at the individual level as well as at the community level. The care providers viewed their efforts as purposeful directed towards the goal of rendering quality neonatal care and saving lives of newborns. The SCNU head Diburgarh, took immense pride in saying that ***"SCNU has brought the neonatal mortality figures to nearly half and they hope to continue doing better"***. It was not long ago that there was no concept of dedicated or special care for neonates in the district hospitals, but setting up of the SCNUs has made quality care available to underserved population.

The SCNU-in-charge of Lalitpur unit said that SCNU was being instrumental in bringing about a sea change in the quality of care. He also applauded the performance of the unit saying that NMR at SCNU Lalitpur was 15%, much lower than that of Jhansi. Care providers across the units affirmed positive trend in utilization and also expressed concern on the capability of accommodating the demand multiplying manifold due to the JSY. Keeping in vision of the UNICEF to serve the poor and needy, all the UNICEF supported units have been strategically established at remote tribal or difficult to access areas. The utilization patterns were also indicative of the effectiveness of the SCNUs in addressing the equity issue. As reported by the care providers at the units, the major chunk of the beneficiaries were from poor socioeconomic background with few from middle class as well. The normal pattern of catchment area across units suggested that patients came not only from within the district but also the bordering districts. The concentration was huge in urban areas around hospital but for some SCNUs, the patient inflow was spread across the district.

5.13.2 Utilization of the services

Though the volume of patient in-flow is a function of growing demand, it is also a reflection of the practices followed at the unit. While the bed occupancy was in the range of 95 to more than 100 percent for most of the units, SCNU Vaishali was underutilized. One of the underlying reasons for admission overload was the laxity of admission and discharge criteria. One of the doctors in SCNU Mayurbhanj said: ***'SCNU is getting very popular. People come from far off places, sometimes from other states. We always try and admit maximum cases. Still there is a lot of pressure from the community to admit cases and we end up keeping some babies for observation only."***

Admission and discharge criteria as prescribed by NNF are in place but they were not practically followed at the units, except in Purulia as affirmed by observation and interview with the care providers.A medical officer at Purulia SCNU said “admission criteria is strictly followed thus there is no over admission to the SCNU”. In case , the bed is not available , the case is admitted in the pediatric ward. The doctor treats the baby, which means that though the doctors are particular about maintaining 1:1 patient: bed ratio, they try to accommodate needy case, in case they are anticipating a bed to get vacated. He also told that, ***"if there is a major congenital malformation or the baby stays for more than 48 hrs in the pediatric ward or has shared the bed with an infected child in the pediatric ward, that child is denied admission to the SCNU to avoid the risk of infection getting transmitted to other babies."*** The afore mentioned criterion is followed only at Purulia SCNU.

Though the admission load, as depicted by the admission registers, was found to be huge in one of the SCNUs, on probing further, a large number of cases were found to be kept merely for observation and overall average length of stay was found to be very less. The head when intrigued about it said, *"There is no admission or discharge criteria , no treatment protocol, no referral policy, and we have no justification to offer if we wish to refuse admissions. Ideally, only babies up to 28 days are admitted but sometimes we have to admit older babies too. We can't refuse any case. We have even admitted 700gms, 800gms, even 450 gm babies. Having protocols in place would help us function better"*.

The Civil Surgeon of Guna expressed a lot of enthusiasm and optimism about the performance of the unit. He in fact said, ***'we have to improve the performance of the entire hospital in order to keep up with the SCNU standards'***.

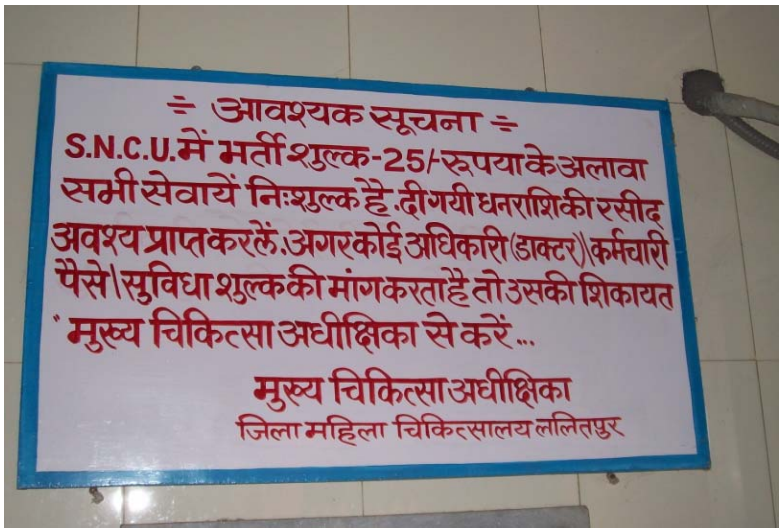


Plate 5.28 Notice displaying the admission charges in SCNU

Sometimes back, there was a message across in one of the units that doctors take money for admitting babies. This was taken up by the administration very seriously and notices were put up everywhere that apart from an admission fees of Rs 25, rest of the services were free of cost.

5.13.3 Constraints

5.13.3.1 Human resources

The magnitude of human resource constraint is a serious matter of concern for ensuring viability of the model in the long run. The SCNU is an intensive care unit operating round the clock. As per the ideal scenario, the units must have 3 plus 1 doctors for manning the unit but due to availability issue, most of the units having desinated doctors have 2 pediatricians while the ones with 3 or more doctors have their pediatricians multi tasking and handling other units besides SCNU. The in-charge of Mayurbhanj unit, said, *"We had advertised for the post of doctors for SCNU but there was no candidate willing to join. Finally we had to get doctors from PHCs on deputation. As of now there is no problem but the two specialists are on deputation and there will be a problem if they get transferred"*. The in-charge at Purulia said that they appraise the performance of doctors before posting them to SCNUs. A lot of dedication is required and not all doctors can work in this set up.

SCNU Lalitpur also faced huge shortage of nurses, as told by nurses, ***"we do not get leave like other nurses and are always on duty. Even festivals and other holidays are of no use"***. Another nurse at Lalitpur unit told, *"hum 6 nurses hain , har koi nou se baarah ghante ki duty karti hai tabhi unit chalta hai, hum kya karen, hum kabhi apne ghar bhi nahi ja sakte"*. We are six nurses working. Everyone works for 9-12 hours daily to keep the unit running. We can not leave the station and go

home.The in-charge of Port Blair SCNU said ,***"There are more than 12 beds and only 2 doctors, one being the SCNU head and other being the MO are actively managing the SCNU. We need more doctors to manage the unit"***.

The nursing head in Vaishali said emphatically , ***"There are 5 doctors in the unit but only 2 qualified staff nurses. Rest of the nursing work is taken care of by ANMs deputed from PHCs***. *Shortage of staff nurses are there in the whole of Bihar. ANM training school also remained closed for some time. ANMs are not so skilled. They call us or the doctors each time insertion of IV cannula is needed"*.

There was a significant difference in level of job satisfaction amongst the contractual staff when compared against permanent staff across the SCNUs and across the line of care providers- doctors, nurses and support staff. Various reasons for job satisfaction were stated. A nurse in Dibrugarh mentioned that good understanding amongst staff existed. ***"Sister Incharge if strict can keep the staff disciplined given the high work load and demand"***. Another sister in Lalitpur told" ***If I am made permanent, then I will not go"***. Since Tonk is close to the main city of Jaipur, retention of staff was not an issue at Tonk but a salary of Rs 4500 pm and just Rs 2100 for contractual nursing and support staff (sweeper) respectively is extremely low compared to the permanent staff.Even the contractual staff on same designation in district hospital were getting more salary. Another sister re-affirmed saying that, ***"we are contractual at present and we have been told that we will be made permanent after 2-3 yrs But that looks quite uncertain as of now"***.

Most of the doctors were satisfied with the kind of work that they had to do. Overall, clean and peaceful working environment, team spirit, good learning exposure, sense of social service were the pull factors. Yet the respondents expressed some concerns pertaining to their involvement with SCNUs. There was no incentive for putting in so much of hard work and time, and no job security existed for contractual staff. **Difference in pay structure among staff across the SCNUs was also a reason for discontentment**. One doctor from Lalitpur remarked, "*In MP, a contractual doctor is paid Rs 35000, i.e. 10,000 extra than us. Besides, there is no incentive on per-patient basis as is there in Nutritional Rehabilitation Centres.*" A doctor working on contractual basis expressed that in the absence of a provision to stay on the campus it became difficult to be on emergency duty. Doctors who were working for SCNU exclusively felt that their satisfaction level would go up if they were freed from other duties like attending OPDs, taking care of pediatric wards etc. Yet some doctors also hinted that their association with SCNUs had improved their private practice as well.

During the initial phase of operationalization of the SCNU, induction trainings for the staff were conducted by the UNICEF and NNF. A doctor at Dibrugarh said, "We conduct regular classes for PG students and staff nurses. Efforts began with a lot of enthusiasm but sustaining it with consistency is difficult". SCNU staff at Mayurbhanj and Vaishali demanded for refresher training. The staff at these units desire to be trained at centres of higher learning. The major issue with training was that the new staff joining after the initial training remained untrained. SCNU staff at Lalitpur said that efficiency of SCNU was dependent on equipment. There should be an orientation of the staff regarding use and maintenance of equipment.

5.13.3.2 Repair and maintenance of equipment

The major issue faced by all the SCNUs is that of the maintenance and repair of the equipment. The equipment were purchased and procured by UNICEF in all the units , but in post weaning phase (after one or two years), their maintenance became the responsibility of the state government. The SCNU is largely equipment driven unit, where most of the machines are used on 24 by 7 basis. Frequent breakdown of machines, therefore, had severe implications on the working of the unit. Staff from all the SCNUs remarked that ***the equipment providing agency or company never provided the staff any demonstration or training in the handling the equipments***. In the absence

of any locally available technician to address the minor repair issues, the SCNUs had no choice but to wait for the visit of the service engineers from the company, at the state level. With the most of the SCNUs located in difficult to reach and remote locations, the delay in repair was a common affair. The SCNU head, Dibrugarh told" *There is problem of continuous supply of electricity. Volatage fluctuation is common due to which equipments often get damaged. Sometime back, a mass break down of equipments had taken place due to same problem. There is no AMC for equipments and getting them repaired once broken down, is difficult. There is difficulty getting technical support to fix equipment locally. There is no designated fund towards maintenance and repair of equipment.*" 'The administrative process pertaining was tedious and time consuming and involved a lot of paper work. This was a concern in almost all SCNUs except Guna. The in-charge of SCNU Mayurbhanj told, *"If equipment breaks down, ADMO is informed, then he informs the technician who is supposed to come within 10 days. Sometimes, a local person is contacted who comes after 1-2 days , he is paid by ADMO (medical) from SCNU fund coming from NRHM. No technician is available to repair 2 radiant warmers that were lying non functional for last 2-3 months. Local mechanics cannot manage."* A medical officer in Vaishali told, "Oxygen concentrators break down very fast. We have started using oxygen cylinders but this is not an ideal substitute".

SCNU doctor at one of the units shared his thoughts and said, *"I don't know anything about the specifications laid down. Most of the equipments either have broken down or lay non functional and there is lack of clarity as to who is to be approached for issues pertaining to repair and maintenance of equipments. Secondly, that there is no service network to ensure undue delays in repairs. There is also a shortage of equipment as eight warmers are not sufficient for 14 children. Many equipment provided initially are not working. There is an X-ray machine but it is non operational as there are no technicians, or no trained staff to work on it. The equipment initially were not provided with stabilizer thus a mass break down of equipments took place. Government is not interested in repair of equipments , they would rather buy new ones. Some of the equipments provided, broke down really far. As there is no incentive attached for servicing the SCNU equipments, thus no support for servicing of equipments is provided. There is a need for liaisoning and creating pressure on NRHM"*. Incidences of short circuit and mass breakdown of equipments were reported by Dibrugarh, Port blair and Lalitpur units.

5.13.3.3 Lay Out Constraint

Adherence to the standard guidelines for layout was an issue as expressed by many due to constraint for space. In-charge of Dibrugarh SCNU said, ***"There were gaps in planning for SCNU. Due to space constraints, SCNU is working primarily as an inborn unit with only a small out born unit on a different floor".***

She also highlighted the importance of having a step down room .*"There is no step down because of which there is a serious problem in accommodating demand. We can't transfer the recovering baby to the mother in the post natal ward. Last year approx 13 deaths took place in post natal ward, thus we try to keep the baby in SCNU, thus each baby remains for long", she expressed.*

SCNU-in-charge at Lalitpur told that the feeding room constructed was a very small cabin and thus did't suffice the space requirement. It was therefore being used by nurses. There was a huge space constraint of patient care area in Purulia SCNU. Similarly the area designated for keeping in babies was very less of the total area of the overly spacious Lalitpur unit. There was no designated space for breast feeding in Tonk, the mothers came inside the SCNU and sat in passage, thus overcrowding the unit. Also the way to washroom and stores was through the patient bed room, defeating the entire concept of asepsis and excluding the patient care area. Mother and child were separated because of the step down being on different floor in SCNU Purulia and Tonk. A doctor said, *"we cannot transfer babies to overcrowded unhygienic post natal ward, thus their length of stay increases and we have to refuse needy cases"*. MO in Purulia shared, *"mothers ko raat mein breastfeeding ke liye neeche se aana hota hai, kal ko kisi ke saath kuch ho gaya , tou SCNU doctors se poochenge , ki aapke hote*

aise kaise ho gaya, raat ko itna safe nahi hota". ***(Mothers have to climb up the stairs to reach the SCNU for breast feeding. It is sometimes unsafe also. In case of any untoward incident, people will question us.)***

5.13.3.4 Drug Supply

This was not a major problem in most of the SCNUs as far as supply of essential drugs was concerned. However, the antibiotics of choice were often not available and had to be bought from outside. There was a severe drug constraint in Mayurbhanj unit, as reported by one of the nursing staff member, the drug supply was as short as 10 to 20 % of requirement and syringes were supplied a little more than 50% of requirement. Medical officers in Purulia told that, drug supply was not regular and drugs in government supply were not specific to requirement of paediatric cases. *"Liquid soap for hadwashing is not provided and attendants are asked to purchase. Pediatric drip sets are often not there in the supply and these are procured from the patients." In one of the units, a doctor even mentioned that the drugs available through supply are not of standard quality.*

5.14 Results- community perception

An assessment of community perception and acceptance of the work was carried out to view the program or initiative from the lens of the community, the one it is largely meant for. The qualitative aspects were focused upon with some element of quantitative data. A total of 82 beneficiaries were interviewed, 39 of which were conducted in hospital setting, while rest 43 community cases were tracked down to their addresses in village and interviewed in the community setting. To understand how perception, satisfaction and underlying factors varied across, the respondents for community based interviews were selected to have an adequate representation of cases with varied treatment outcomes, thus out of 82 interviewees, 7 were LAMA/ DAMA cases (who left against medical advice), 17 were death cases, wherein the life of the child could not be saved and rest 58 were discharged alive cases with health treatment outcomes. Though, most of the cases pouring into SCNU were inborn at most of the units, some out born cases (25) were interviewed to gain an insight into how the experiences of an out born cases differed from that of an inborn, in reaching the SCNU, role of referral mechanism, difficulty in seeking admission and the expenses incurred.

5.14.1 Benefeciaries profile

A large number of BPL patients were availing the benefit of the services but, as reflected by data, the utilization pattern was skewed at Lalitpur and Mayurbhanj SCNU where 7 out of 10 and 6 out of 11 respondents respectively, were not BPL. A total of 50 out of 82 beneficiaries (60.98%) interviewed were found to belong to the SC/ST/ OBC category.Twelve out of 82 families (14.63%) reportedly had an income less than Rs1500 pm while 27 families earned up to 3000 and only 16 had an income from3000 Rs to Rs 5000 pm. Only five families had a monthly income ranging from Rs 5000 to Rs 10000 . Nine families were found to have monthly family income above 10,000 Rs. A majority of cases (76/82) did not face any difficulty in seeking admission to the SCNU. The out born cases were also accommodated as early as possible. Most of the admitted cases were males. Both in Tonk and Lalitpur ,there was only a single female admission when the team visited the units.

5.14.2 Trends of institutional delivery

Out of total, 97.56 percent of the respondents had institutional delivery reflecting a growing understanding of the importance of institutional deliveries and the thrust created by the Janani suraksha yojana. A total of 23 out of the 82 cases had delivered at a public health facility other than the district hospital, while another 2 cases were home deliveries, indicating the reason why major case load is inborn patients.

5.14.3 Awareness about the SCNU

Only 30 out of 82 respondents (36.59%) were aware of the presence of SCNU before having availed the service. The common sources of information stated were the referring doctor or through someone in the village. In absence of any promotional measures, the word of mouth plays a major role. The most common route of admission to the SCNU was the labor room, with majority of the admissions being inborn. Out born cases were sent from the pediatric emergency or OPD but keeping in mind the low awareness amongst community, the proportion of out born patients was quite low.

The cross linkages with IMNCI program should be leveraged upon to build referral and follow up mechanism. One of the cases of readmission at Mayurbhanj had told that "bacche ko saans ki takleef thi aur vajan kam tha, illaj ke baad ham ghar aa gaye, par aanganwadi wali ne hame bataya ki bache ka vajan kam hai aur baccha wapas dikhana chaiye, tabhi hum doobara bachha le aaye, aur use bharti kiya gaya". ***(My child was treated and discharged from SCNU. After coming home, an anganwadi worker visited my house. She examined and said that the baby is weak and there is difficulty in breathing.She referred us to the hospital nd child was admitted again).***

5.14.4 Private consultation

Almost 30 percent (25 out of 82) respondents had availed care at private facility before visiting SCNU. The cost incurred ranged from Rs 50 to Rs 10,000. A mother narrated her story as *"bacchi ka ilaaj kaanch ke ghar mein hua tha, par jab doosri bar peeliya hua, tou jhaad phook wale ke paas le gayi, bacchi poori theek na hui tou use baccho ka doctor jo aaspatal mein bethte hain, unke private clinic mein le gayi, teesri baar jane pe bhi bacchi achi na hone pe unhone baccha ward mein bharti karwa diya, agale din bacchi liver infection se mar gayi"*. ***(my daughter was treated in the unit. when she developed jaundice, we took her t****o a faith healer. She did not recover and we took her to the private clinic of a doctor who works in the unit. She was then admitted to the pediatric ward but she expired the very next day)***. Few mothers even expressed that if they gave money to doctors while they were in their private clinics, they took extra care to see their babies.

5.14.5 Mode of transportation

A hired taxi or ambulance (58.5%) and auto/bike (25.6%) were the common mode of transport used for reaching the SCNU whereas hired taxi (50%) and public means of transport like bus or train were used while returning. The cost of transportation increased by1.5 to 2 times if the case had to be transported at night in emergency. The initiatives like EMRI and referral transport were received as a welcome initiative in Dibrugarh, Purulia, Port Blair and Vaishali respectively and were gaining popularity. Only 10 cases amongst interviewees had availed government ambulance service and there was lack of awareness amongst people that they could avail the facility. A case in Mayurbhanj narrated his story *"hum jila aasptal se 8 km pe hi rehte hain par raat mein koi saadhan nahi mila, police raat mein auto nahi chalne deti, mauvadiyon ke karan, maine ambulance ko phone kiya tou unhone kahan driver nahi hai, mein pehle aaspatal tak khud gaya, ek auto dhoond ke laya, phir apni biwi, jo dard mein thi, use le ke gaya, bada bura haal hai"* ***(we stay only 8 kms from the district hospital. Still it was difficult to get an auto at night)***

5.14.6 Attitude of the staff and communication

The attitude of both doctors and nurses was perceived to be nice by 98.78 percent and 92.68 percent respondents respectively. The reason of the admission to SCNU was more often than not told to the patient's family, if not immediately but at least during the course of stay. The practice of party meet held twice a day in Purulia maintained a strong communication with parents. A mother from Port Blair said **"Doctors and nurses take utmost care to treat the child"**. In most of the other units, mothers expressed that the doctors or sisters usually did not communicate condition of the child themselves,

but answered only when they were asked. All the beneficiaries affirmed that doctors were not always there but there were nurses round the clock. Interviewees at some SCNU mentioned that there should be specialist round the clock. One of them said *"We came to SCNU thinking there would always be doctors around".*

5.14.7 Satisfaction with care rendered

The discussions with the beneficiaries across the SCNU revealed that the satisfaction amongst the community was exclusively a function of the treatment outcome. The other issues pertaining to the stay in the hospital were perceived to be trivial by most of the people. One of the similar response was received as ***"bachha achha ho jaye, hame aur kichu naahi chaiye"*** .The 93.9 percent of respondents were satisfied with the care rendered at the SCNU. The commonest reasons stated for satisfaction were improvement in the health of the child and provision of these services by the public health system which they could not have afforded in a private set up.

The doctor patient interface also seemed to influence the patient party satisfaction to a large extent. A respondent whose baby was still admitted said, ***"doctor ne kaha hai , woh puri koshish karege, baaki dekho"*** . The practice of party meet carried out by doctors twice in a day at Purulia SCNU was perceived to be a very positive gesture by the community ***"doctor sahib aate hain , hame bachhe ke bare mein ek ek kar ke batate hain, doctor sahib bahaut hi ache hain, hamne aise doctor sarkari mein pehle nahi dekha"***.

Though most of the people expressed their satisfaction with the care rendered by the SCNU, there were reasons for dissatisfaction also. The commonest reason cited amongst discharged alive cases was non availability of doctor round the clock. A user also expressed his dissatisfaction saying that ***"hospital ne sirf saline diye"*** as he had purchased most of the drugs from private. Another mother from some other SCNU told that ***"saari raat nikal chuki, bache ko ek baar bhi dekhne nahi diya"*** Due to the SCNU and the mother's room or the postnatal ward being on different floors, mothers at some SCNUs faced inconvenience for going for breast feeding and wanted a solution to the problem.

Poor level of cleanliness in the hospital premises was also a concern shared by patients across the SCNUs.

A respondent told his story saying that *"doctor sahib bahaut ache hai, par mein yahan peechle 34 dino se hoon, BPL hoon, par jab mein yahah aaya tha tab koi aur bed free nahi tha, mujhe free bed nahi mila, kisi se kahiye jo free bed khali hain woh hame de den, nahi tou mujhe majbooran bachi le jani hogi. Ham bahar khuley shed mein pade rehte hain, kuch paisa bhi kisi ne chura liya. Koi security nahi hai"* ***(Doctor is very nice but I am staying here for the past 34 days. I belong to BPL category but since beds were not available, I was given a non BPl bed. The expenses are very high nd I cannot afford it any longer.)***

The parents of babies who expired in the SCNUs were also quite satisfied with the care rendered. Most of them believed that the condition of their babies was serious. Yet some believed that negligence of doctors had a role to play. Some of the respondents told that *"hame kisi doctor ya sister ne kuch bataya nahi, bas khatam hua baccha hame haat mein thama diya"*. **(We were not told anything. The baby was handed over to us after he expired).** Another similar response received was, *"doctor tha hi nahi, ham jab se baccha laye , hamne doctor ki shakal bhi na dekhi, ham bacche ko le jana chahate the tou hame le jane bhi na diya, bas subah keh diya ki baccha ab nahi hai"*. **(Doctor was not there ever since we admitted the child. We were not allowed to take the child home).**

Interestingly, nearly 3 of the 17 death cases perceived that the negligence was on the part of the staff in the labour room rather than the SCNU. There were also complaints regarding rude and negligent attitude of the labour room staff towards the mother in the labour ward.

On the whole, the community held a positive perception of the SCNU and the presence of SCNU was not only helping save the life of the newborns but also served as an image building measure.

5.14.8 Reasons for LAMA / DAMA

Most of the beneficiaries at SCNUs were poor and daily wage earners. Bearing the cost on food and stay , daily wage loss and sometimes even on treatment of child was beyond the capacity. This was the common reason stated in Dibrugarh and Tonk.

A case of re-admission, interviewed in Mayurbhanj told that the mother's meal was stopped once the baby was shifted to the step down and she was compelled to take away the baby as she did not have money to eat anything. There were misconceptions prevalent like a mother in Dibrugarh told that ***"The SCNU staff had advised against discharge but I took my baby as I thought she will be OK as even my last one had got ok. Also they were taking blood again and again when already the baby was weak. So I asked for discharge".*** A case who was on paid bed in Purulia SCNU had gone LAMA as they did not wait for the doctor to come and give them discharge because then that day would have got counted for payment. The nexus of hospital staff with private practitioners and rampant malpractice of alluring the poor uneducated patients to private was the underlying cause of LAMA cases in some SCNUs. Across the SCNUs, there were instances of people going LAMA / DAMA as they did not understand rationale or need of keeping baby in SCNU; this reflected lack of communication from the care provider's end.

5.14.9 Out-of-pocket expenditure

The analysis revealed that the major chunk of the cost borne by the patient party was on the drugs and consumables. The cost incurred on purchase of drugs varied across the centers depending on the drug supply to the unit. While carrying out expenditure analysis at some SCNUs ,it was found that some of the cases , though BPL were paying as they were not asked for the BPL card.In some instances, they themselves were not aware of this facility. There was a policy of reimbursement of cost incurred by a BPL on drugs, but practically the users were neither informed of the policy nor did anyone avail the benefit despite the policy being in place. Users at one unit were even asked to purchase the liquid hand wash as same was not supplied to the unit. Beneficiaries also spent on buying diapers at Dibrugarh, Mayurbhanj and Port Blair.

Table 5.14.1 Average expenditure per day

Unit	Average Out of pocket expenditure per day (Rs)*
Tonk	250
Dibrugarh	400
Mayurbhanj	400
Purulia	750
Lalitpur	450
Vaishali	400
Port Blair	100
Guna	500

*includes cost of transportation to and from SCNU, admission fees, cost on drugs and other consumables cost on medications, investigations, bed charges.

The average out of pocket expenditure was minimum (2.23 USD) among all the SCNUs, while it was found to be maximum (16.70 USD) in Purulia (Table 5.14.1).

5.14.10 Counselling and follow up

The general treatment seeking behavior for follow up was that people went for follow up only if the baby was not well but SCNU at Purulia and Port Blair had a strong follow up component. One of the mothers who had come for follow up in Purulia said, ***bachhi choti hai aur ab theek bhi hai , itni sardi mein use le jana bhi mushkil hai , isliye mein nahi gayi". (My baby was small and it was very cold. I did not get my child then)*** There seemed to be a lack of understanding of the rationale of follow up, which was so important especially in case of a LBW baby. Few mothers interviewed from the community also mentioned that they were called to the private clinics of doctors.

The counseling component was found to be particularly weak in most of the places. The instructions were generally explained by staff nurses but many said that sisters were very busy during the day. **"Sometimes they do not get time to talk to us even"**, one of them said. The presence of a public health nurse at Port Blair was an added advantage since the counseling component was largely handled by her. The mothers at Port Blair and Purulia SCNU could point wise detail the instructions and aseptic protocols advised to them while the same could not be elicited in the same detail from mothers who had availed service at other SCNUs .

5.15 Field worker's perspective

The field workers form the connecting thread between the care providers/ health facility and the community or the people, the services are largely meant for. They work at the grass root level and thus understand the pulse and the needs of the community. At least two field workers per site were interviewed. In total, 19 interviews were conducted, out of which 6 were ASHAs, 5 AWWs, 6 ANMs and 1 lady health visitor.

Discussions and interviews with the people in the community and the field workers had underscored the importance of awareness building as not many people were still aware of the presence of the units in their area. Awareness of the services was the key to utilization but more important than that was to assess the areas where such measures must be taken on priority basis.

Experiences of beneficiaries known to the field workers were explored, which revealed that community members who had availed the services were generally satisfied and their satisfaction was attributed to the improvement in the health of the baby and his life getting saved. The experiences shared were more or less good.

Only 25% of respondents thought that the PHCs in their area were equipped enough to do the initial management of the neonatal emergency cases and stablilize the case. A field worker working in Kidwai , Viradha block of Lalitpur said *"logon ka bahaut vishvaas hai".case referrer tabhi kartey hain jab sambhal na paye. Badia ilaaj aur badia dawai milti hai PHC mein"* ***(People have a lot of faith in PHCs. Cases are referred only when they cannot be managed here.***

There was a general tendency of bypassing the referral mechanism and reaching district hospital instead of relying on the sub centre or primary health centre or some peripheral workers. Most of the out born cases were the ones wherein mother delivered at PHC in their area. The general perception held was that SCNU was meant for LBW babies. Establishment of SCNU had acted as an image building exercise and reinforcing faith in the public health system. As told by one of respondents in Mayurbhanj, ***"Now less people prefer private set up"***. Another respondent in Lalitpur told that *"hamare shehar mein private doctors hain , par wo jhola chaap hain isliye hum logon ko mana karte hain aur log bhi wahan jana pasand nahi karte. Log sarkari pasand karten hain, par agar yahan bhi bachhe ki care na ho tou private le jate hain."*

Amongst the respondents, all the ASHAs and the ANMs (except AWWs and those yet to be trained) were found to be trained in IMNCI and affirmed the utility and benefit of the training rendered. On the other hand, no field worker was reportedly trained or oriented towards SCNU through any training. Yet 99 percent of respondents were found to be aware of the presence of SCNU but only one of them had seen the SNCU from inside. All of those who were aware could correctly mention the number of years since SCNU had been operational.

An evident male preference was affirmed by field workers in Tonk, Lalitpur and Vaishali. But it was not prevalent in Port Blair and tribes of Dibrugarh. Overall, this trend seemed to be declining with time. As reported by field workers, distance, non availability of means of transportation or high cost of transportation, restriction on free access into the SCNU and most importantly, lack of awareness of presence of unit were the barriers to access.

Need for providing transport aid, especially at night and in difficult to reach areas was raised by 4 field workers. Three respondents suggested the need of awareness building in order to increase utilization of SCNU but also reduced unnecessary overcrowding of the units. During the initial few years, UNICEF had decided not to take up awareness building measures so as to avoid overburdening the special care newborn units and let them have time for capacity building and gauge their utility during the experimental phase. The premise behind the policy decision was that not every case

should be referred to the SCNUs and the cases should not bypass the referral mechanism in place as this would ensure that the cases actually in need would be admitted to SCNUs.

A field worker in Purulia emphasized on need of strengthening the peripheral units to improvise penetration of services ***"SCNU bahaut door hai isliye NSUs aur Block PHCs ko sudhar karna chaiye."*** (SCNu is far off. Hence NSU and Block should also improve their services)Need of curtailing cost borne on medicines and free provisioning of medicines was suggested by interviewees in Mayurbhanj. An expansion of unit area and increasing number of beds was recommended in Mayurbhanj.

There was a need to leverage upon the potential of field workers in enhancing awareness of the units. These field workers can be instrumental in not only ensuring that every needy case reaches the SCNU but also they can act as gate keepers to check over referral. The field and the facility services, if linked and leveraged upon can go a long way in helping achieve the desired reduction in neonatal mortality and making this model a huge success.

5.16 Highlights from each SCNU

5.16.1 TONK

Indicators	2008	2009
Rate of still birth/100 deliveries	1.8	1.3
Prevalence of low birth weight babies	10.5	18.0
Total admissions in SCNU	1315	1222
Proportion of male admissions	67.8	70
Proportion of inborn cases	62.4	65.7
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	10.8	10.3
cases with birth wt <1000gms (as proportion of total admissions)	0.5	0.8
LAMA Rate/100 Aadmissions	0.8	0.5
Mortality Rate/100 admissions	7.4	7.0
Decline in NMR after 1 year of functioning	4.5%	

STRENGTHS

1. **Utilization:** The utilization of the SCNU has increased over time
2. **Data Management :** The data records are being well maintained by the SCNU officials
3. The per day expense reported is around Rs 200-500, relatively lower than other SCNUs

CHALLENGES:

1. Human resource

a. There is no designated paediatrician for the SCNU.

b. There are male nurses working in the SCNU who are not trained in the Neonatology or SCNU management. The female nurses who were trained for SCNUs had to be posted in the post natal wards as the female nurses are acceptable to mothers and therefore cross shifting of male nurses deployed here was done to SCNU in exchange of female nurses

c. The SCNU is mainly being run by the nursing staff thus their training aspect needs to be focussed upon

2 **Lay out constraint :** The Step down unit of the SCNU is on a different floor

3 **Gender bias :** The most of the cases admitted to the SCNU are males, which makes it imperative to probe in to the sex bias in the utilization of the SCNU.

4. **Asepsis :** The protocols of asepsis, though in place, are not being adhered to ,especially the gowns and face mask are not used by the health personnel

5. The newborn care and the neonatal units though in place , are not being utilized

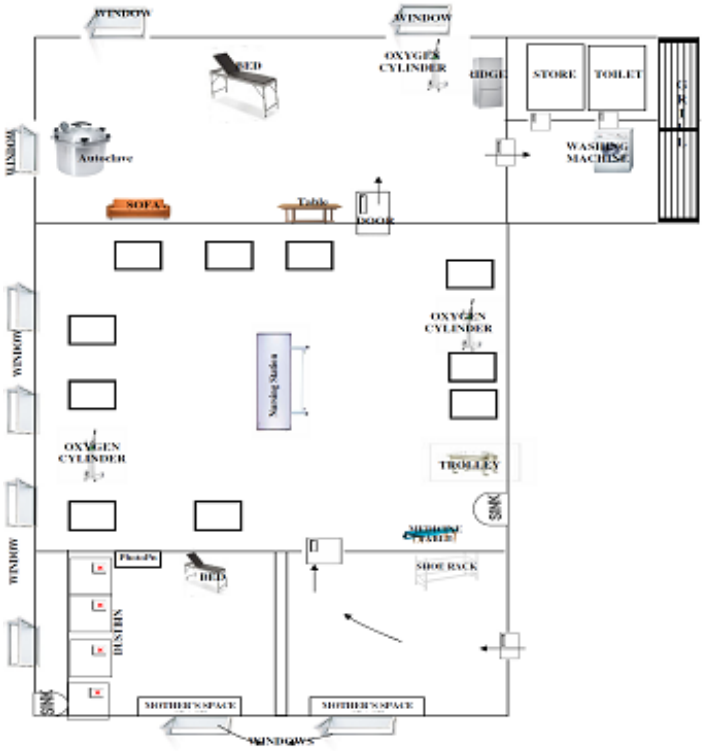


Plate 5.29 Layout Tonk

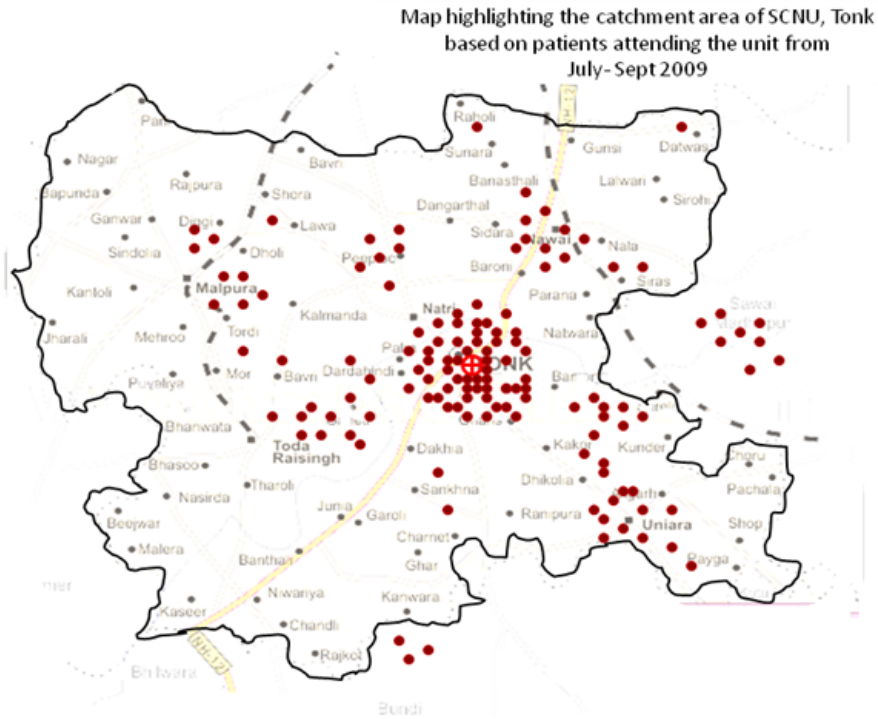


Plate 5.30 Catchment area Tonk

5.16.2 DIBRUGARH

Indicators	2008	2009
Rate of still birth/100 deliveries	4.7	5.8
Prevalence of low birth weight babies	24.6	28.5
Total admissions in SCNU	1502	1357
Proportion of male admissions	42.3	50
Proportion of inborn cases	88.6	90.3
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	8.5	8.0
cases with birth wt <1000gms (as proportion of total admissions)	1.5	1.1
LAMA Rate/100 Aadmissions	11.7	10.5
Mortality Rate/100 admissions	5.9	7.9
Decline in NMR after 1 year of functioning	11.8%	

STRENGTHS

1. Impact and utilization:

a. The utilization of the SCNU is good, with 100 percent bed occupancy.

b. The most of the beneficiaries belong to poor socioeconomic strata, thus it is serving poor.

2. Human resource:

a. There is a strong sense of team spirit amongst staff with mutual support and commitment towards the goal

b. The SCNU Dibrugarh because of being in a Medical college , is not only serving as a learning ground for building a cadre of professionals in the field but also gets immense support of PG students in making students more efficient

3. The SCNU Dibrugarh is more like a tertiary care set up with 3 ventilators in place

4. **Drug Supply :** The drug supply is regular and sufficient except few items which are not provided in government supply

CHALLENGES :

1. Lay out constraint:

a. The bed strength for out born was seemingly not taken into account while planning and the set up is working primarily as an inborn unit.

b. There is no step down nursery and it is not preferred to shift convalescent baby to the mother staying in the overcrowded post natal ward. In absence of step down nursery, it is difficult to accommodate more patients

2. Human resource :

a. There is shortage of specialists and the unit is being run by only two doctors with an additional support of PG students, who are overburdened

b. There is no data manager, no lab technician, no counsellor, and no separate security guard for the SCNU

3. Equipments : Repair and maintenance of equipments is a persistent issue as equipments are not covered under AMC and there is no technician available locally for repairs. There was negligent attitude from the equipment providing agency as the visit of the service engineer postponed till the equipments lapsed the warranty period.

4. Asepsis : The protocols of asepsis are not strictly adhered to. The visiting mothers are not instructed to follow asepsis.

5. Lack of patient education : The counseling component is weak.

6. Poor Follow up rate : The decline in the NMR is facility based and due to the follow up rate being so poor, it is difficult to assess state of newborn's health post discharge

Map highlighting the catchment area of SCNU, Dibrugarh based on patients attending the unit from July- Sept 2009

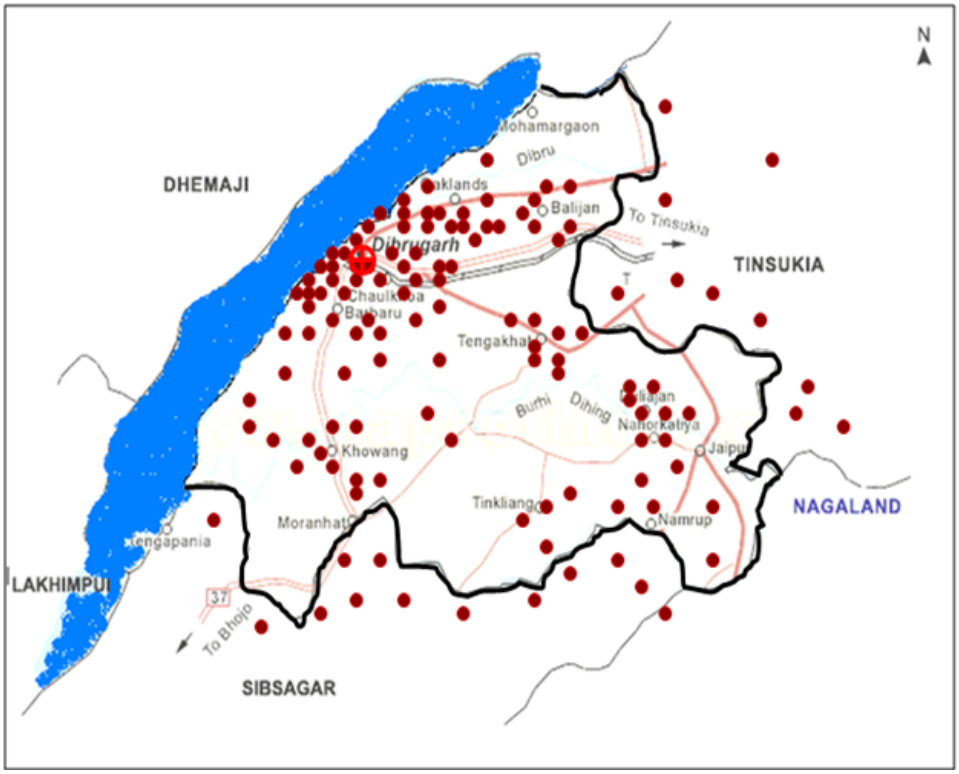


Plate 5.31. Catchment Area Dibrugarh

5.16.3 MAYURBHANJ

Indicators	2008	2009
Rate of still birth/100 deliveries	NA	6.0
Prevalence of low birth weight babies	NA	NA
Total admissions in SCNU	1425	1283
Proportion of male admissions	NA	NA
Proportion of inborn cases	63.9	65.8
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	9.3	0.0
cases with birth wt <1000gms (as proportion of total admissions)	2.1	2.5
LAMA Rate/100 Aadmissions	2.5	3.1
Mortality Rate/100 admissions	12.3	15.7
Decline in NMR after 1 year of functioning	28.4%	

STRENGTHS

1. The unit is located in a tribal area, difficult to reach.
2. There is a huge demand for SCNU services. Partly its utilization has been facilitated by IMNCI.
3. There is a strong commitment of the administration.
4. Many beneficiaries come from adjacent states like West Bengal and Jharkhand

CHALLENGES :

1. Overcrowding of the SCNU

- There are 30-40 admissions per day with the overcrowding at the SCNU. Two babies on one bed is quite common and due to overload,delineation between Outborn and Inborn is not being adhered to.
- Over referral from periphery - the neonatal stabilization units are not functional to the optimal level and instead of managing the case there itself, the cases are more often than not referred.
- Over referral from the labour room and as per the SCNU staff, the newborn care corner is almost non functional
- The admission policy is not being followed and no case is refused admission ,leading to overcrowding

2. Human resource

a. There is no sanctioned post for the doctors for SCNU. The two paediatricians who have been deputed from the peripheral CHCs and they are managing the paediatrics OPD, IPD , paediatric emergency besides SCNU and they keep shuffling in shifts

b. The doctors are overloaded with salary perceived to be no where commensurate to the work load

c. The contractual staff expressed concerns like less salary , non commensurate to the increasing workload with rising utilization, no facility of accommodation and no scope of raise in salary with the growing inflation and no job security

3. Readmission rate: Readmission rate is high which could probably be because the cases are discharged as soon as possible to accommodate the crowd

4. Equipment-

There is no AMC for any of the equipment and the process of getting the equipment is complicated and has to be processed through the channel of clerk to ADM to SDM. Thus, the process is time consuming and loss is huge

5. Supplies : Drug supply is erratic

6. Asepsis : Overcrowding of SCNU and extreme shortage of water are possible causes.The protocol of hand washing was not being followed strictly

7. Investigations : There is no side lab and all the investigations are done in Disttrict Lab.

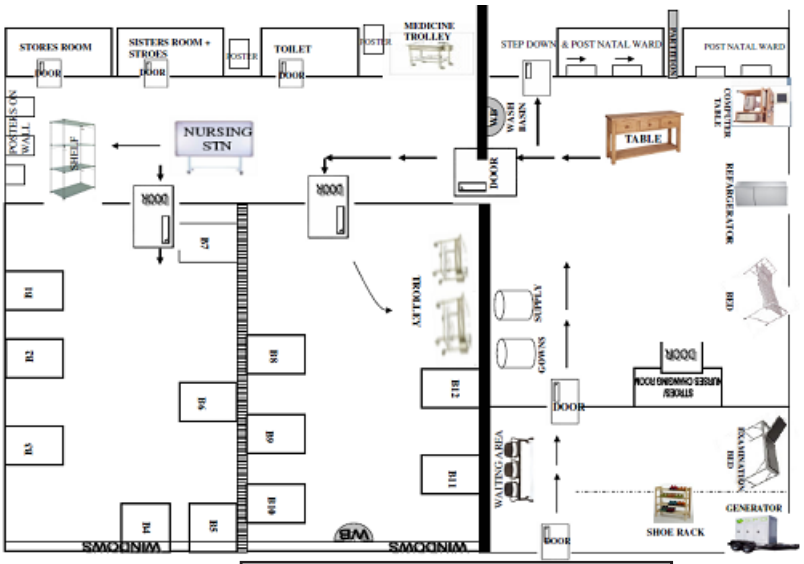


Plate 5.32 Layout Mayurbhanj

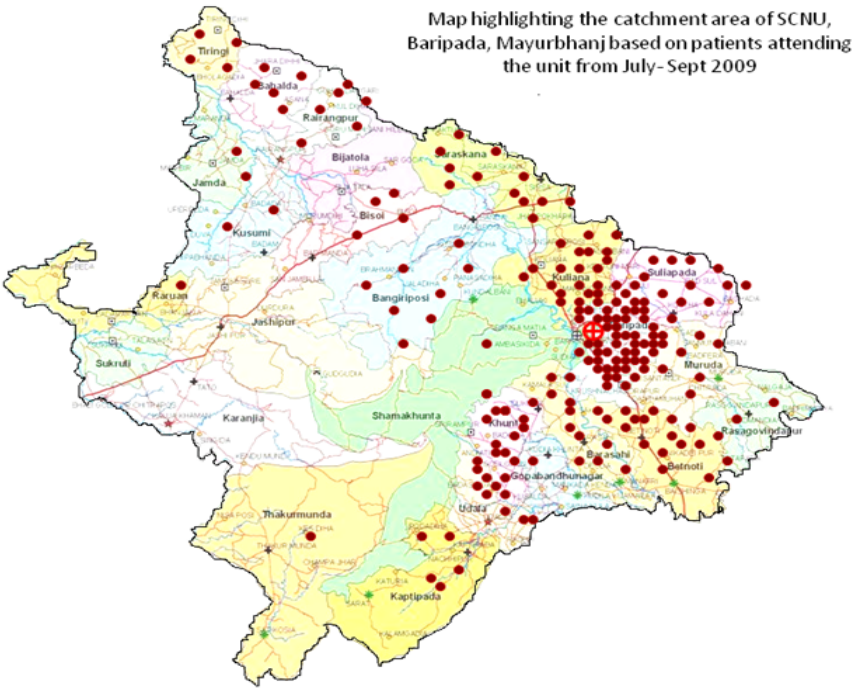


Plate 5.33 Catchment area Mayurbhanj

5.16.4 LALITPUR

Indicators	2008	2009
Rate of still birth/100 deliveries	NA	NA
Prevalence of low birth weight babies	NA	8.6
Total admissions in SCNU	211	677
Proportion of male admissions	47.9	68.1
Proportion of inborn cases	85.3	53.8
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	NA	NA
cases with birth wt <1000gms (as proportion of total admissions)	NA	NA
LAMA Rate/100 Aadmissions	0.9	1.5
Mortality Rate/100 admissions	16.6	18.1
Decline in NMR after 1 year of functioning	-8.6%	

STRENGTHS

1. Nurses are satisfied with the remuneration that they are getting
2. Good team spirit amongst nurses
3. Total space allocated for SCNU is adequate
4. Information pertaining to SCNU (including user fees) are displayed in the campus to check malpractices

CHALLENGES

1. There is shortage of beds, there are sometimes 3 babies in a trolley. There is a lot of external pressure to admit the baby. Many babies are admitted just for observation.

2. Human Resource:

- There is acute shortage of nurses. 1 unit lay non functional as there was insufficient staff to run and manage that.
- There is no designated sweeper or aaya and thus proper hygiene maintenance is difficult.

3. Equipment: Most of the equipment had broken down and lay non functional and there was no service network to ensure unduly delays in repairs. There was also a shortage of equipments.

4. Drug supply was erratic

5. There was no admission/ discharge policy

6. Linkages with NSU is weak.

5.16.5 PURULIA

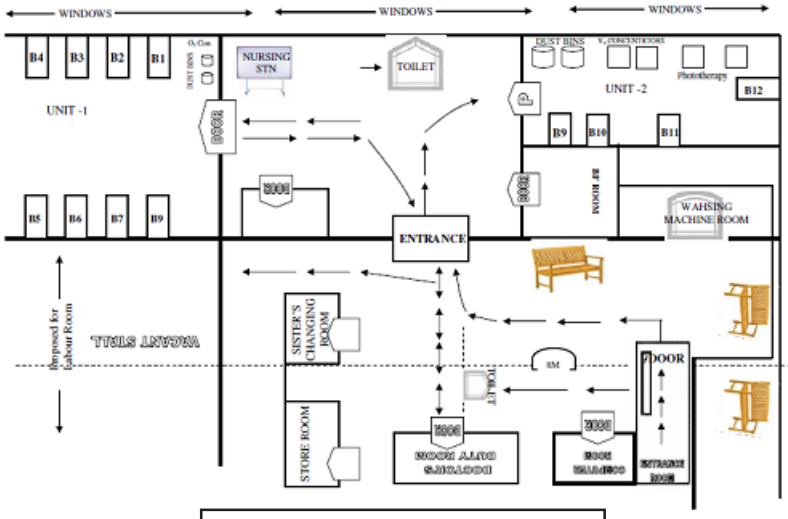


Plate 5.34 Layout Lalitpur

Indicators	2008	2009
Rate of still birth/100 deliveries	4.9	5.6
Prevalence of low birth weight babies	20.9	28.4
Total admissions in SCNU	413	286
Proportion of male admissions	64.4	64
Proportion of inborn cases	82.3	71.3
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	5.1	4.5
cases with birth wt <1000gms (as proportion of total admissions)	0.5	0.0
LAMA Rate/100 Aadmissions	1.7	3.8
Mortality Rate/100 admissions	6.8	7.3
Decline in NMR after 1 year of functioning	48.1%	

STRENGTHS

1. The admission and discharge criterion is strictly followed

2. The protocols of asepsis are strictly adhered to ensure proper asepsis in the unit

3. The mother's counseling and education component is extremely strong and they are instructed on aspesis, Kangaroo baby care, mother crafting etc

4. A new cadre of skilled manpower called special nurse assistants called as Newborn Aides to overcome the problem of skilled manpower shortage

5. There is an active referral mechanism with the Hub and spoke model of SCNU linked to the NSUs ensuring that the patients do not bypass the level of care and referrals. The SNSUs, with necessary facilities and staff, also provide clinical service of stabilizing the conditions of sick neonates before it reaches to SCNU.

6. The doctor-patient party interface is strong with a consistent communication channel maintained with patient's family through a practice of party meet held twice in a day

7.The SCNU Purulia has it's own revenue generation model, wherein 50 percent of beds are free and reserved for BPLs and rest are paid on a unit basis .On an average, morethan Rs. 20,000/- per month is recovered as bedcharges alone from SCNU.

CHALLENGES

1. **Lay out constraint-** There is space constraint in the SCNU , thus the prescribed lay out could not be adhered to.The SCNU, the mother's room, the Labor room all three are located on different floors. Thus transporting the baby from the labor room to the SCNU and frequent visit of mothers to SCNU for breastfeeding, especially at night is difficult. The space available for the SCNU is congested and limited, especially for any future expansion of beds to accommodate rising demand
2. **Equipment-**The breakdown of equipments is a recent phenomenon. Every 10-15 days, something or the other breaks down as most of the equipments have reached their shelf life and thus their longevity has reduced. The equipment would need replacement in near future
3. **Human resource shortage -**There are just 2 medical officers managing the SCNU ,
4. **Investigations-** There is no side lab and due to delayed and erroneous unreliable reporting from district lab, private labs are depended upon which has cost implications on patient's family.
5. **Drugs and consumables-** The drug supply is reportedly insufficient and branded drugs from private are more relied upon and perceived to yield better treatment outcomes by clinicians. The supply of consumables is also erratic. People buy even syringes, Ryle's tube, soap for handwashing etc
6. **Revenue generation-** The revenue generation model though good, has pitfalls in absence of any policy for transferring a BPL patient from a paid bed to a free bed once any unpaid bed gets vacant in the unit.The patient party has to bear large chunk of cost on drugs and investigations, running many into debt.

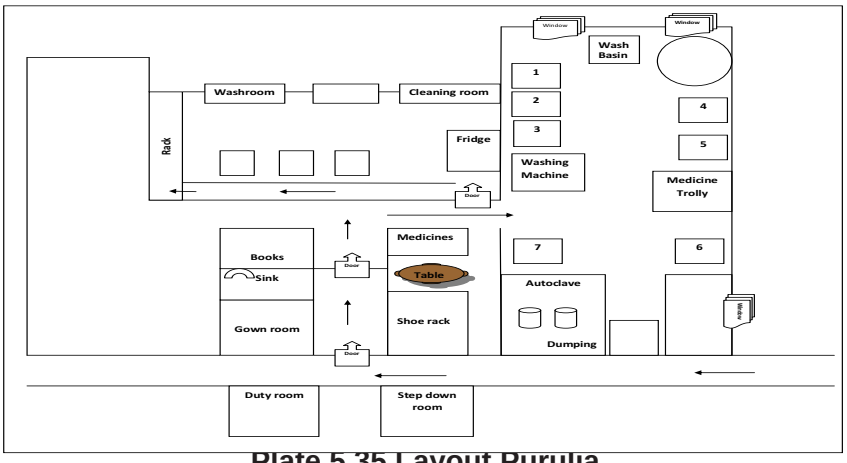


Plate 5.35 Layout Purulia

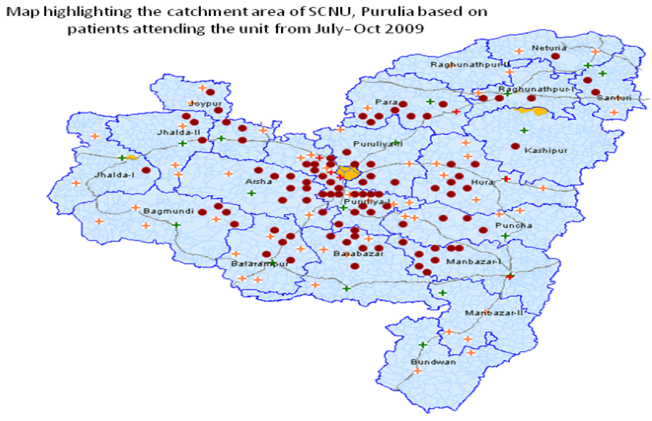


Plate 5.36 Catchment area Purulia

STRENGTHS

5.16.6 VAISHALI

Indicators	2008	2009
Rate of still birth/100 deliveries	1.9	2.3
Prevalence of low birth weight babies	NA	NA
Total admissions in SCNU	414	226
Proportion of male admissions	72.9	75.7
Proportion of inborn cases	38.6	60.2
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	7.2	9.7
cases with birth wt <1000gms (as proportion of total admissions)	1.0	1.3
LAMA Rate/100 Aadmissions	5.6	6.2
Mortality Rate/100 admissions	21.7	12.4
Decline in NMR after 1 year of functioning	43.0%	

1. There is no space constraint in the SCNU
2. Most of the equipments are in functional state with no major issue of break down.
3. There are 5 doctors available , which is the highest number of doctors available amongst all the SCNUs
4. The drug supply is adequate with all the essential medicines regularly available in the stock

CHALLENGES

1. The unit is grossly underutilized with an extremely low bed occupancy rate. The out born unit lay unutilized.
2. Acute shortage of nurses in the SCNU. Amongst a team of 13 nurses, there are only 2 staff nurses, and rest are ANMs
3. Most of the nursing staff is untrained and there is a huge dependency on few trained ones.
4. Frequent breakdown of oOxygen concentrators took place in past due to which they have shifted to using oxygen cylinders
5. The protocols of asepsis are not being adhered to. There is no practice of wearing gowns / mask/ gloves before entering the SCNU. The hand washing protocol is also not followed.
6. The awareness level regarding SCNU is low amongst community members
7. There is a huge inclination towards private health sector amongst community members
8. There is no AMC of the equipments

5.16.7 PORT BLAIR

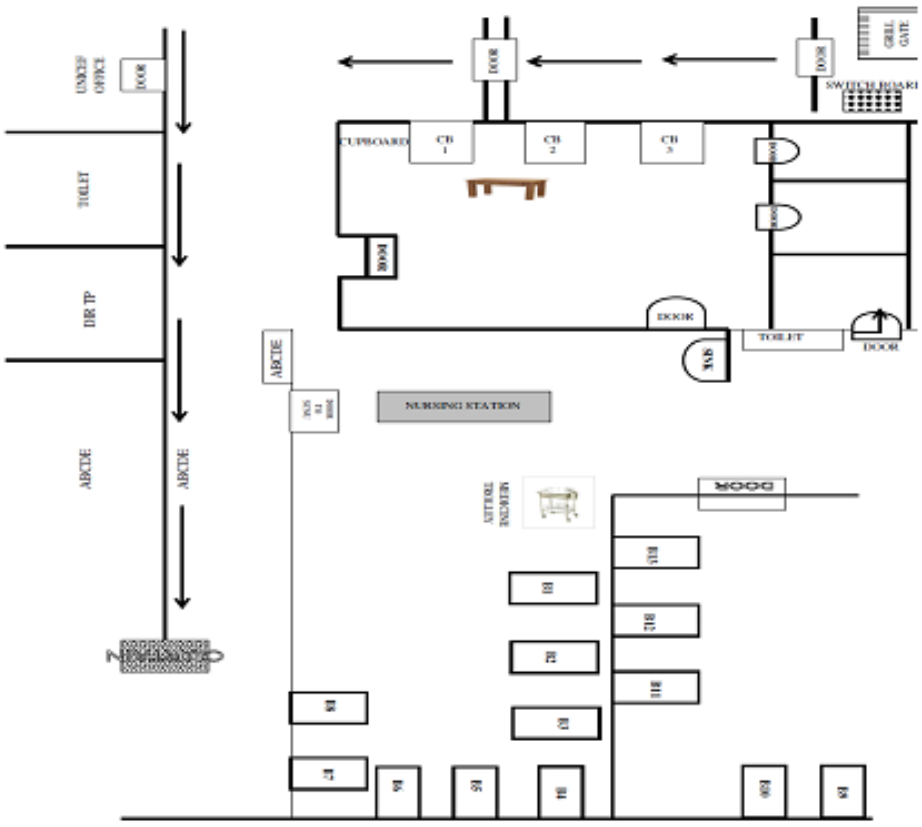


Plate 5.37 Layout Vaishali

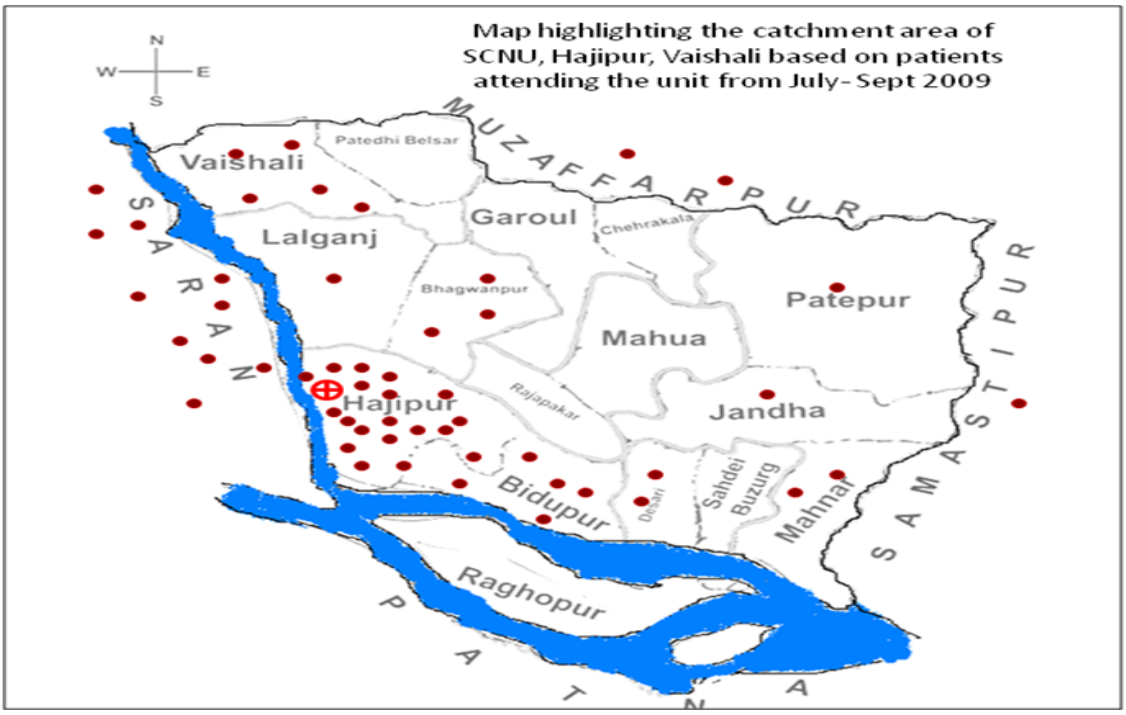


Plate 5.38 Catchment area Vaishali

Indicators	2008	2009
Rate of still birth/100 deliveries	2.7	2.8
Prevalence of low birth weight babies	30.7	34.1
Total admissions in SCNU	713	624
Proportion of male admissions	59.6	57.7
Proportion of inborn cases	89.1	95.8
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	7.6	5.8
cases with birth wt <1000gms (as proportion of total admissions)	0	0
LAMA Rate/100 Aadmissions	0	0
Mortality Rate/100 admissions	7.7	7.1
Decline in NMR after 1 year of functioning	16.2%	

STRENGTHS

1. Human Resources

a. Committed and efficient staff caring for sick newborns

b. Support ofpPublic health nurse since inception - engaged in lactation, hypothermia prevention and follow up counseling issues

c. Presence of laboratory technician- aides in drawing samples of newborns and also in-house basic investigations of the newborns.

d. Presence of data entry operator

2. Utilization of services at SCNU- admission rates are good

3. Strong Follow up component- Follow up OPD every Tuesday and higher compliance rates of discharged newborns in attending these OPDS

4. Drug Supply- is ensured adequate and replenishment of stock is regularly, all drugs are provided free of cost of the patients

5. Proper delegation of responsibilities and adherence to protocols by staff

6. Presence of Step-down nursery available

7. Asepsis maintenance is good - patients wear cap and gowns while feeding ; proper hand washing technique is maintained by staff while handling newborns. The SCNU is kept clean regularly.

8. Client satisfaction- excellent in terms of quality of care and behavior of staff. Expenditure of the clients is minimal and no user fees charged from them.

9. Good administrative support from NRHM- ensures availability and earmarking for funds for efficient functioning

10. Presence of NSUs at peripheral health facilities- function of these NSUs at CHCs act as a support and may decrease the load of sick neonates admitted from outside. Referral mechanism good.

CHALLENGES

1. Human Resources

a. Number of doctors inadequate- Only 2 doctors are posted

b. Doctors are not exclusively posted for SCNU, round the clock availability of doctor cannot be attempted.

c. Majority of the staff including doctor, staff nurses, lab technician, data entry operator are placed under contractual arrangement through NRHM leading to dissatisfaction in terms of salary and security of job.

d. There is absence of sweeper in the SCNU despite its sanction. The other Group D staff is utilized for sweeping and maintaining cleanliness.

2. Location of SCNU: There is considerable distance between labour room and SCNU. They are also located at different floors.

3. Absence of strict protocols for admission

4. Equipments: adequate in number but some were non functional. Maintenance and repair is a concern because of absence of a local biomedical engineer.

5. Transportation: Despite the presence of ambulances from government health centres, sometimes transfer of neonates is difficult owing to geographical access and connectivity of the SCNU.

6. Coordination between hospital laboratory: There is lack of full support rendered by main lab of the hospital, due to which some of the investigations are done from outside.

7. Referral to higher centres and tertiary care support- Due to geographical difficult location, it takes time to refer sick unstable children to higher centres, which impede the provision of adequate care to children that need tertiary care ventilator support. Though a ventilator is available, it is non functional. .

8. Training need of staff nurses for providing Ventilator care- To compensate for non presence of higher facility in the vicinity, staff nurses are currently not trained in providing ventilator care.

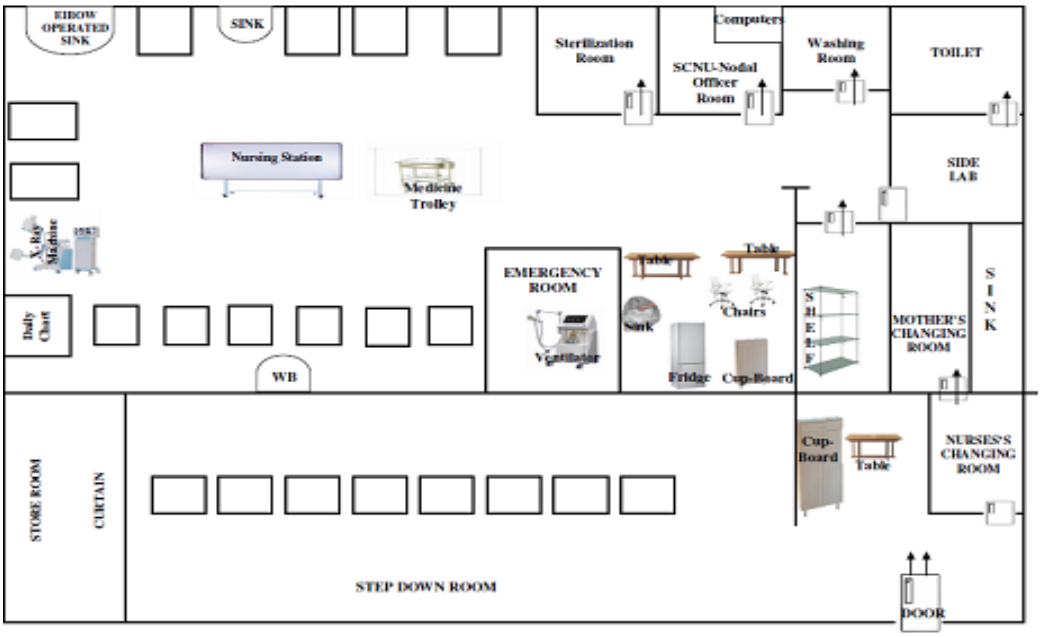
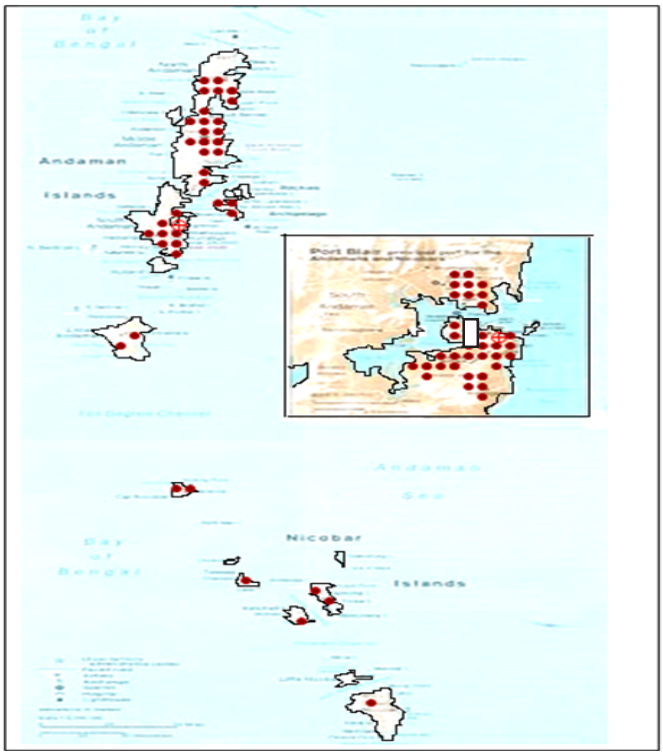


Plate 5.39 Layout Port Blair



Map highlighting the catchment area of SCNU, Port Blair based on patients attending the unit from July- Sept 2009

Plate 5.40 Catchment area Port Blair

5.16.8 GUNA

Indicators	2008	2009
Rate of still birth/100 deliveries	3.3	2.8
Prevalence of low birth weight babies	NA	NA
Total admissions in SCNU	1762	1597
Proportion of male admissions	67.9	68.1
Proportion of inborn cases	60.2	53.7
cases with birth wt between 1000-1499 gms (as proportion of total admissions)	9.5	10.6
cases with birth wt <1000gms (as proportion of total admissions)	0.6	1.5
LAMA Rate/100 Aadmissions	5.2	4.4
Mortality Rate/100 admissions	13.8	12.0
Decline in NMR after 1 year of functioning	13.6%	

STRENGTHS

1. Human Resources

a. Doctors and nurses are exclusively designated for SCNUs

b. Presence of security guard- restricting entry of persons in SCNU

2. Lay out of SCNU

a. Proximity to labour room

b. Separate ward for stable babies comprising of 7 beds

CHALLENGES

1. Human Resources

a. All positions are entirely contractual, creating a sense of dissatisfaction among staff especially related to their salary.

b. Supporting staff- wardboys, aaayas, and sweepers' salary is low Rs 2500 per month.

c. Two vacant positions of staff nurses persisting for a long time, though there are ten nurses working in the unit in shift duties.

2. Problems in Lay out/ infrastructure

a. Within the entire layout, no separate provision for nurses' duty room.

b. Absence of elbow operated wash basin for hand washing.

c. Provision for mothers stay as a part of post natal ward in the hospital due to deficiency in number of beds

3. Requirement of more beds in commensurate to the load of newborns: there is increasing load of newborns in the unit that leads to placing 2-3 neonates within a single bed.

4. Protocols for management- No protocols are followed except admission and discharge guidelines. Each pediatrician follows its own guidelines pertaining to disease management.

5. Non maintenance of asepsis procedures in the unit

a. Routine hand washing practices are not practiced by staff, especially while handling different newborns.

b. Cap and mask not worn by the staff.

6. Weak Follow up of discharged neonates- only 10% of neonates discharged (as reported by the head in-charge) return for follow up.

7. Weak communication, counseling during admission and discharge- the staff both doctors and nurses don't communicate and counsel regarding disease, rationale of treatment and advise about appropriate care of the newborn after discharge.

8. Absence of IEC material in the SCNU- IEC material creating awareness in context to different issues is totally lacking.

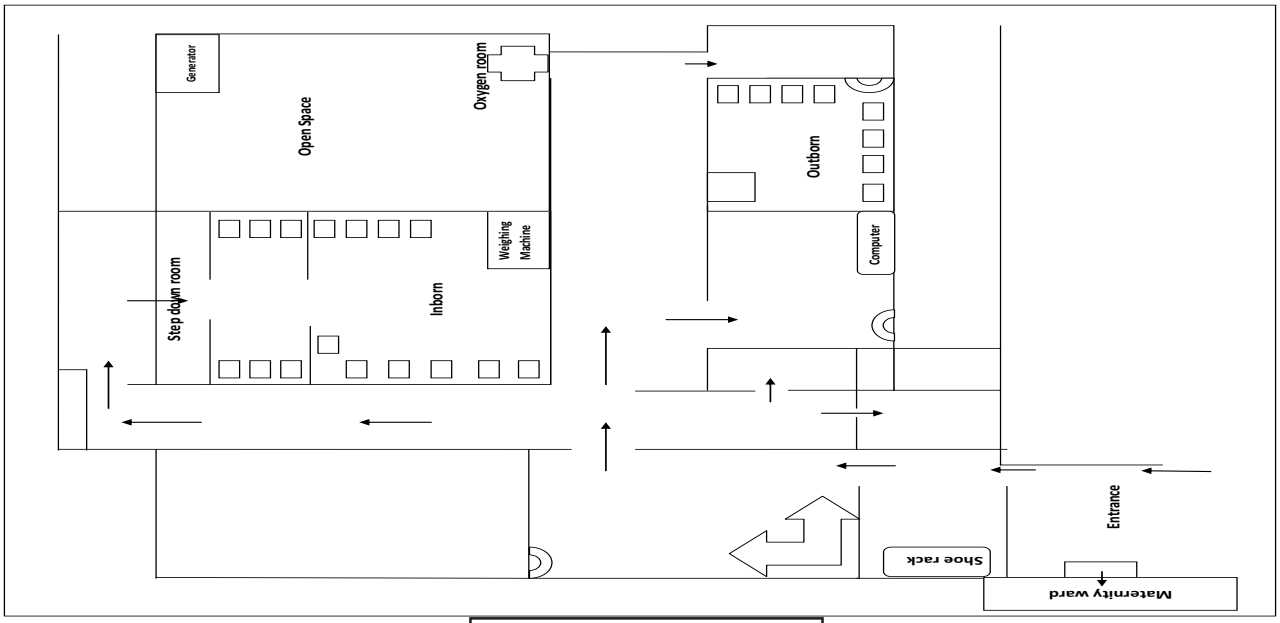


Plate 5.41 Layout Guna

Map highlighting the catchment area of SCNU, Guna based on patients attending the unit from July- Sept 2009

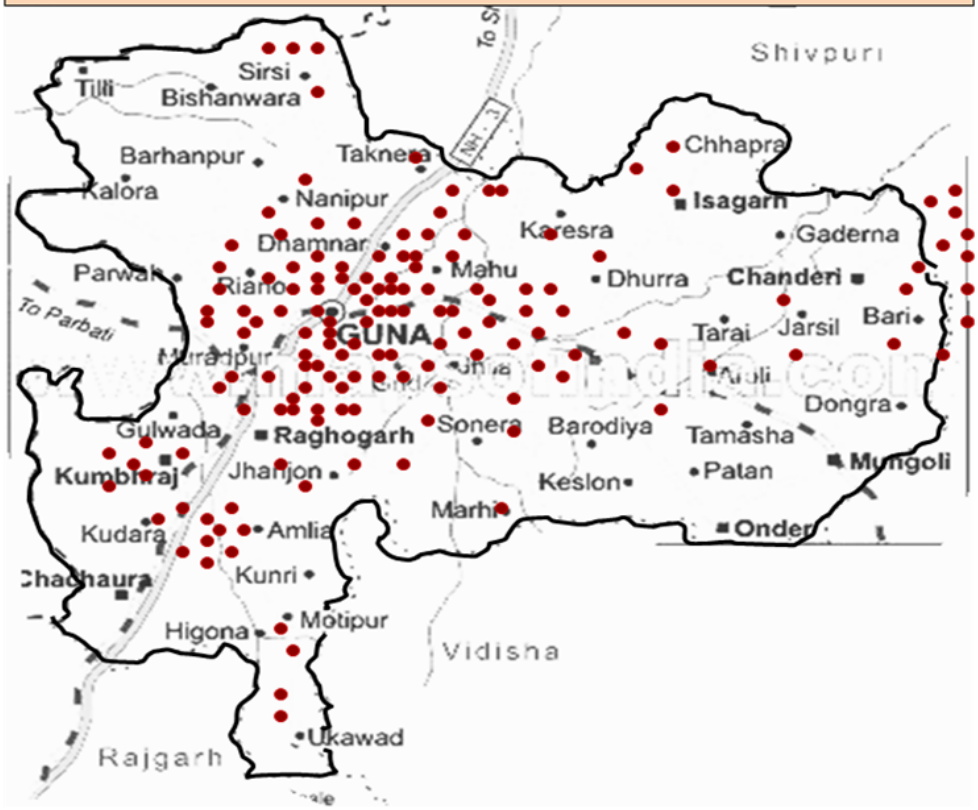


Plate 5.42 Catchment area Guna

Annexure 1

Review of Special Care Newborn Units (SCNU)

Working towards a healthier India

Indian Institute of Public Health (IIPH- Delhi),

Public Health Foundation of India (PHFI)

PROFORMA FOR FACILITY SURVEY OF A

SPECIAL CARE NEWBORN UNITS

DATA COLLECTION TOOL

Collection of secondary data from SCNU is a part of a larger study that aims to improve the functioning of the existing SCNUs and to gather experiences for scaling up in other districts.
This tool attempts to capture the current situation of the capacity of SCNUs to respond to government's priority to improve neonatal health. The findings would help us examine the resources available and accessible; identify bottlenecks in the functioning of the units and set forth recommendations to overcome them. Your responses in this regard will be of immense help for us.
For clarification on any question feel free to contact:
sutapa.bneogi@iiphd.org, sumit.malhotra@iiphd.org

Name and signature of the SCNU In charge:

Date of submission of the Proforma:

SECTION A- STATE LEVEL INFORMATION

A.1 Name of the state_____

A.2 Number of SCNUs in the State_____

A.3 Number of SCNUs in the state which are operational for more than two years_____

A.4 Number of UNICEF Supported SCNUs in the State_____

SECTION B- DETAILS OF THE DISTRICT HOSPITAL (for 2008)

B.1 Name of the District_____

B.2 Number of Neonatal stabilization Units in the District _____

B.3 Name of the District Hospital_____

B.4 Date of starting of the SCNU _____

SECTION C- SUPPORT TO THE SNCU (NAME OF THE SUPPORT PROVIDING AGENCY)

	Funding support	Technical support
Infrastructure		
Equipments		
Supplies		
Salaries		

SECTION D- INFORMATION SPECIFIC TO SCNU

D.1 Total No. Of beds in SCNU _____

D.2 Is the Labour room attached to or in close proximity to the SCNU? _____ (Yes/No)

D.3 Which floor is the Labour room/ Delivery area located? _____

D.4 Which floor is the SCNU located? _____

D.5 How much is the distance between the SCNU and the Labour room/ Delivery area?

D.6 Is any special designated area assigned in SCNU for the following?

Designated area	Yes	No
Breast feeding room		
Rooming in area		
Hand wash and gowning		
Duty room for doctors		
Duty room for Nurses		
Clean utility area (for storing supplies for regular use)		
Soiled utility room (for storing use and contaminated material)		
Designated area for mixing I/V fluids		
Designated area for Boiling and Autoclaving		
Designated area for laundry		
Stores		
Side lab		

SECTION E HUMAN RESOURCES AT SCNU

Section E.1 -Doctors in SCNU:

Designation	No. Sanctioned *	No. currently in position	No. hired on contractual basis	No. on the permanent Basis	Arrangement (Fresh Recruitment/ Deputed from other department)	Remarks
Paediatrician						
Doctor/ Medical officer						

Section E.2- Nursing staff in SNCU:

Designation	No. Sanctioned *	No. currently in position	No. hired on contractual basis	No. on the permanent Basis	Arrangement (Fresh Recruitment/ Deputed from other department)	Remarks
Head Nurse/ In-charge						
Staff Nurses						
Nursing Aides						
ANM						
Others (specify) 1 2 3						

*Details of the staff exclusively sanctioned for the SCNU has to be given and not the staff sanctioned for the hospital. Leave the boxes blank, wherever there are no staffs exclusively sanctioned for the SCNU

Section E.3- Miscellaneous staff in SCNU

	No. Sanctioned *	No. currently in position	No. hired on contractual basis	No. on the permanent Basis	Arrangement (Fresh Recruitment/ Deputed from other department)	Remarks
Cleaning and Helper staff						
Security staff						
Lab Technician						
Data Entry Operator						
Any other staff Designated for SCNU **1** **2** **3**						

* Details of the staff exclusively sanctioned for the SCNU has to be given and not the staff sanctioned for the hospital. Leave the boxes blank, wherever there are no staffs exclusively sanctioned for the SCNU

Section E.5 Miscellaneous questions on staffing

E.5.1-Are the Doctors posted regularly for the SCNU or they keep rotating?

_____

E.5.2-Were the Staff Nurses pooled from the other sources or the fresh recruitments conducted for the Nurses required in SCNU?

_____

E.5.3-Since the SCNU became operational, how many Doctors who were working in SCNU have left job? (Put Remarks, if any)

_____

E.5.4-Since the SCNU became operational, how many Nurses who were working in SCNU have left job? (Put Remarks, if any)

_____

E.5.5-Since the SCNU became operational, how many amongst the miscellaneous staffs (Mention the staff category) who were working in SCNU have left job? (Put Remarks, if any)

_____

Section E.6 Training of the staff working in SCNU

YEAR	Designation	No. of Trainings	Duration of Trainings	Agency conducting Trainings	Place of Training	Nature of Training (Observer-ship/ Practical)	Remarks
2007	Pediatrician						
	Medical officers						
	Head Nurse / In-charge						
	Staff Nurses						
	ANMs						
	Any other, please specify						
2008	Pediatrician						
	Medical officers						
	Head Nurse / In-charge						
	Staff Nurses						
	ANMs						
	Any other, please specify						
YEAR	Designation	No. of Trainings	Duration of Trainings	Agency conducting Trainings	Place of Training	Nature of Training (Observer ship/ Practical)	Remarks
2009	Pediatrician						
	Medical officers						

SECTION F- EQUIPMENTS AT SCNU

SECTION F.1- List of Equipments at SCNU

S No.		Item/ Equipment	Available	Qty. Available	Functional status over last year	Remarks
			Yes / no		Yes / no	
	MONITORING EQUIPMENTS					
1.		Stethoscope with neonatal chest-piece				
2.		Non-invasive BP monitors				
3.		Heart Rate/ Apnea monitor				
4.		Pulse Oximeter				
5.		Low reading clinical thermometers				
6.		Room thermometers				
7.		Electronic Baby weighing scales				
8.		Mechanical Baby weighing scale				
	WARMING EQUIPMENTS					
9.		Baby warmer				
	RESUCITATION EQUIPMENTS					
10.		Self Inflating bag				
11.		Infant laryngoscopes				
12.		Endotracheal Tubes (2.5, 3.0, 3.5 mm) with adapters				
13.		Syringe pump				
14.		Foot operated suction pump				
	OXYGEN ATION FACILITY					
	Oxygen source					
15.		Centralized				
		Oxygen Cylinders				
16.		Concentrator				
	Oxygen Delivery					
		Head Boxes for delivery of Oxygen				
	EQUIPMENTS FOR INVESTIGATION					
17.		Micro-hematocrit (Hemoglobinometer)				
18.		Dextrometer				

Section F.2-Maintainance / Repair of the SCNU Equipments

S.NO	Item/ equipment	Maintenance contract AMC Yes / no	Maintenance contract AMC Within district/ out of district	Preventive visits conducted as a part of AMC	Any breakdown during last one year (if more than one equipments have broken down, list numbers of equipments)	Time taken to get the equipment functional	Remarks
1.	Non-invasive BP monitors						
2.	Pulse Oximeter						
3.	Suction machine						
4.	Electronic weighing scales						
5.	Baby warmer						
6.	Phototherapy unit						
7.	Generator						
8.	Invertors						

F2.3 Is Any Log Book maintained for a technician visit for the equipments? (Yes/ No)

SECTION G- DRUG/ ITEM LIST AT SCNU

Section G.1- Drugs at SCNU

Name of Drug	Availability (yes/ no)	Regularity of the supply in last one year (yes/no)	Status of stock Sufficiency (yes/no)	Remarks
Adrenaline				
Sodium bicarbonate				
Nalorphine				
Special intravenous fluids for neonatal use				
Antibiotics				
Other electrolyte solution				
Normal saline				

Section G.2- Items for Asepsis

Name of the Item	Availability (yes/ no)	Regularity of the supply in last one year (yes/no)	Status of stock Sufficiency (yes/no)	Remarks
Désinfectants avalable e.g. Hypochlorite solution, Cidex, Polysan, Savlon etc.				
Gloves				
Disposable equipment's for patient care e.g. needles, syringes				
Chlorhexidine for hand washing.				
Gowns				
slippers				
Gloves				
Elbow operated wash-basin		[redacted]		
Facilities for isolation of infected babies.				
Laminar flow system				
Hot running water				
Vacuum cleaning				

SECTION-H MISCELLANEOUS

Section H1- Lighting Facilities at SCNU

H1.1- Is the day-light visible in the SCNU?

H1. 2 Provision of Back-up Light and Electrical Safety

		No. Available (if yes)	Battery Power
Provision of Back-up Light			
	Generator		
	Invertor		
	Stabilizer		
Provision safety of electrical devices and equipments			
	Voltage stabilizer		
	Invertors		

Section H2-Housekeeping, Cleanliness and Hygiene at SCNU

H2.1-Is the continuous water supply available to the SCNU

H2.2 How many times is cleaning of SCNU done in 24 hours?

Section H3-Availability of the Policy/ Guidelines/ Manuals for:

Protocols for Asepsis	**Available (Yes/ no)**
Hand Washing	
Biomedical Waste Management	
Protocols for Patient/ Case Management	
Protocols for Handling Equipments	
Protocols for Administrative Processes	
Admission Policy	
Discharge Policy	
Breast feeding policy on Public Display	

Section H4-Lab Facilities: Place where lab samples are sent to for investigations

	Side Lab	**District Hospital Lab**	**Private facility**
Routine Investigations E.g. Hemoglobin, cell counts			
Biochemical Investigations E.g. Sugar, Serum Bilurubin etc			
Microbiological E.g. CSF, culture sensitivity analysis etc			

SectionH5- AVAILABILITY OF NEWBORN CARE CORNER IN THE LABOUR ROOM

H5.1 Is there a newborn care corner available in labour room?

	YES	**NO**	**Remarks**
Labour room			
Operation Theatre			

H5.2 Who is available for newborn care in the labour room (answer based on what happens most commonly):

	YES	NO	
Staff nurses posted in the labour room			
Staff nurses posted in the SCNU			
ANM			
Any other, specify			

H5.3 Does the same care provider who delivers the baby, also stabilizes the baby or there is a separate care provider for that?

H5.4 What equipments are available in the Labour room?

	YES	NO	REMARKS
Radiant warmer			
Oxygen			
Self Inflating/ Resuscitation bag and mask			
Laryngoscope			

Section I5-TRAININGS

Section I 5.1- SCNU as a Training Centre for Health Personnel

		Observation Based training in SCNU	Skill based training in SCNU	Duration of training	Agency conducting Training	Remarks
YEAR 2007						
	Medical Officers					
	ANMs					
	ASHA					
	Anganwadi workers					
	Any other, please specify					
YEAR 2008						
	Medical Officers					
	ANMs					
	ASHA					
	Anganwadi workers					
	Any other, please specify					
YEAR 2009						
	Medical Officers					
	ANMs					

Section J -SUPERVISION AND SUPPORT

J.1-No of supervisory visits conducted to the SCNU over past 3 years? Mention who conducted the visits (UNICEF/ NNF/ State department)

	Year 2007	Year2008	Year 2009`	Remarks
UNICEF				
NRHM/ State Department				
NNF				
Any other				

SECTION K- RECORD MAINTAINANCE

	Available (Yes/ No)	Remarks
Admission Register		
Discharge Register		
Stock Register for consumables like drugs and disposable items		
Stock Register for Non-consumable Items		
Any other Register 1 2 3		

SECTION L- NEONATAL CARE PROVISION BY SCNU

Section L.1- Year- Wise Morbidity and Mortality Data of SCNU

	2006	**2007**	**2008**	**2009** (up to 31st Sept. 2009)
Total No of deliveries in the Hospital				
Total No. of Caesarean sections carried out in the year				
No. of Live Births in District				
<1.5 Kgs				
1.5 – 1.9 Kgs				
2.0-2.4 kgs				
>/= 2.5 Kgs				
No. of Still Births in Hospital				
Total Number of Admissions in the SCNU				
Male				
Female				
Total No. of In-born cases admitted to SCNU				
Birth weight > 2500 gm				
1500 – 2499 gm				
1000 – 1499 gm				
< 1000 gm				
Gestation > 37 weeks				
34 – 37 weeks				
30 – 34 weeks				
< 30 weeks				
Total No. of out-born cases admitted to SCNU				
Birth weight > 2500 gm				

Section L 2 - Month- Wise Morbidity and Mortality Data of SCNU for the Year 2008-2009

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Total No of deliveries in the Hospital												
Total No. of Caesarean sections carried out in the year												
No. of Live Births in District												
<1.5 Kgs												
1.5 – 1.9 Kgs												
2.0-2.4 kgs												
>/= 2.5 Kgs												
No. of Still Births in Hospital												
Total Number of Admissions in the SCNU												
Male												
Female												
Total No. of In-born cases admitted to SCNU												
Birth weight > 2500 gm												
1500 – 2499 gm												
1000 – 1499 gm												
< 1000 gm												
Gestation > 37 weeks												
34 – 37 weeks												
30 – 34 weeks												

Annexure 2:

Query: Facility Based Newborn Care - Experiences; Examples

Compiled by Joy Elamon, Resource Person and Meenakshi Aggarwal, Research Associate

Issue Date: 11 November 2009

From Sutapa B Neogi and Sumit Malhotra, Indian Institute of Public Health, Public Health Foundation of India, New Delhi

Posted 3 September 2009

Public Health Foundation of India is a public private partnership collaboratively evolved to redress the limited institutional capacity in India for strengthening training, research, and policy development in Public Health including neonatal, child, and maternal health. The focus is on public health that encompasses promotive, preventive, and therapeutic services including promotion of research activities tailored to Indian conditions.

Every year, 4 million newborn babies die in the first month of life - 99% of these in low and middle-income countries. India carries the highest single share of neonatal deaths in the world - around 25-30% of the world total. The high rate of neonatal deaths constitutes two-thirds of the infant deaths. Also, 45% of the neonatal deaths occur within the first two days of life.

'Facility based neonatal care' is an attempt by the Government of India to strengthen the neonatal care provision. Assessments suggest that strengthening the clinical system or community activities alone have little effect. The greatest success comes when both are linked. Intensive State level essential newborn care training and operationalization have failed to bring down the Neonatal Mortality Rate (NMR). Substantial improvements in NMR needs back-up support of state of the art newborn care units in hospitals with a large number of deliveries. These have been currently established in a few districts of a few states in India.

It is imperative to learn from the experiences of implementation and functioning of existing Facility based newborn units. The Government of India (GOI) intends to scale up these units in other districts. Public Health Foundation of India is planning a review to understand the achievements and bottlenecks in successful functioning of these centers.

We request the members to share their experiences with respect to the following:

- Any evidences on effective functioning and impact of facility based newborn care? (published/ unpublished / personal viewpoints)
- What are the critical challenges and limitations faced by the staff of facility based newborn units?
- Have referral linkages been established for effective utilization of services?
- What are the success stories that have demonstrated the effectiveness of facility based newborn units?

Your inputs will help us know the diverse experiences on facility based newborn care from all over the country. Those specially related to the challenges faced and recommendations that are feasible and cost effective will strengthen the report. Your efforts will be duly appreciated and acknowledged in the review report.

Responses were received, with thanks, from

1. Minal Doshi, Setu Developmental Intervention Centre, Ahmedabad

2. Uday Pathak, Mahavir Vatsalya Aspatal, Bihar
3. Amitava Sen, Society for Applied Studies, Kolkata (Response1, Response2)
4. Prabir Chatterjee, UNICEF, West Bengal
5. Jorge G. Caravotta, UNICEF, New Delhi (Response1, Response2)
6. Pankaj Mehta, UNICEF - Nepal Country Office, Nepal (Response1, Response2)
7. Krishna Sahai, State Health Society, Bihar
8. Rajan Dubey, UNOPS - NIPI, Madhya Pradesh
9. Ruchi Mishra, Directorate of Health Services, Madhya Pradesh
10. Sanjib Saha and Utpal Majumdar, Child Survival Cell, Purulia, West Bengal
11. D. K. Dewan, State MCH Officer, Government of Delhi
12. Vijayashankara C N, Sri Devaraj Urs College of Nursing, Kolar, Bangalore
13. Ravishwar Sinha, Independent Consultant, New Delhi (Response1, Response2*)
14. Pravin H Khobragade, UNICEF, Chhattisgarh
15. Reeta Bora, Neonatal Unit, Dibrugarh, Assam

*Offline Contribution

Summary of Responses

The neonatal mortality rate in India is no doubt unacceptably high due to unattended home deliveries, hypothermia, birth asphyxia, birth injuries, and infections including tetanus. The accessibility of the facility with in a short time is of primary importance to make an impact on existing neonatal morbidity and mortality rate. 'Facility based neonatal care' is an attempt by the Government of India to strengthen the neonatal care provision. The first Sick Newborn Care Unit (SNCU) was set up at Purulia district hospital in West Bengal in 2003 and came to be known as "The Purulia Model". The Purulia model was later replicated at GB Pant Hospital at Port Blair, Andaman and Nicobar Islands, in other districts of West Bengal and in other states with modifications and refinement. A few like "The Guna Model" of Madhya Pradesh and others are sprouting up in the states like Madhya Pradesh, Uttar Pradesh, Rajasthan which need these units most. A study of Purulia model showed that a modern sick newborn care facility created in a district hospital can substantially reduce hospital neonatal deaths and neonatal mortality rate of the district.

The establishment of "Child Survival Cell" established in Purulia improved the functioning of the Sick Newborn Stabilization Units (SNSU) in nine blocks with more children being stabilized at these centres, instead of being referred straight to the district unit. It helped in linking the district unit with block level stabilization units. Similarly, the SNCU in Vaishali District of Bihar managed more than 900 seriously ill newborns and now going to be scaled up in 24 districts.

At the same time, it is difficult to bring mothers to the nearest well equipped centres, the reason being the distance to travel is longer and non availability of easy and immediate transportation. More so, neonatal units have to function on standardized guidelines and getting the staff to follow protocols fails and attitudinal changes take a lot of time and perseverance.

Additionally, an important problem that is often faced by the district and block units is lack of timely repair of equipments. In spite of an annual maintenance contract, often technicians do not reach these remote areas on time. At these units, there exists lack of expertise among the staff in regular maintenance of the equipments. The staff at SNCU and SNSU must have preliminary knowledge on handling and maintaining basic equipments through a user friendly manual and regular support for replacement/repair/maintenance of basic equipments needs to be strengthened.

The challenges and limitations faced at the units are -

- Lack of skilled manpower at grass roots
- Insufficient training of medical and paramedical professionals in handling SNCU, clinical staff and support staff have no exposure in terms of training and self development impeding the work
- Maintenance and upkeep of disposables, consumables and fixed assets
- Erratic electricity and water supply and the ventilators, phototherapy units, infusion pumps need electricity
- Frequent malfunctioning of equipments
- Unavailability of service engineers for biomedical equipment in rural areas or small cities or delays in repairing the equipments which leads to monitors, ventilators, phototherapy units remaining out of order for months
- Lack of Annual maintenance contract of equipments which makes it almost impossible to get the equipments repaired whose warranty period is over.
- Unwillingness of the staff to work at SNCU as it would require them to visit the hospital on a more frequent basis and spend longer hours working
- Due to financial constrains many sick babies with active problems are taken home by parents
- Less space availability leads to difficulty in continuing Kangroo Mother Care (KMC) for babies by the mother
- Most of the mothers of sick babies do not get a proper bed in the post natal ward.
- Health education and mother crafting cannot be taught properly to these mothers as they are not in a single room
- Not much is available on 'Post Survival" care and hence, easy distribution of information is not possible.

To overcome some of the dependencies, young physicians were trained in the neonatology unit in a Kolkata hospital and posted in the unit and proved to be highly capable. Local solutions (e.g. the use of oxygenators to overcome the shortage of oxygen supply) to cut down on costs and decrease dependency on "far away" based suppliers were encouraged and found to be very effective. Newborn aides were found to be extremely efficient in their assigned tasks and greatly mitigated the need for nursing staff.

In Chattisgarh, the levels of facilities were upgraded in the identified institutions and the facilities offered were planned keeping in mind the mother - baby pair together. Apart from many other things, it was ensured that the medical equipment was functional and the staff was trained. Specially, for improving the referral linkages, ambulances were made operational with backup support from 'call center'. The untied funds from NRHM to these facilities were utilized to make the facilities have aesthetically good look and provide quality care to the relatives and patients.

Members were of view that with the support of authorities it is possible to provide health care to every newborn in a cost effective manner. The efforts to utilize MBBS graduates, developing newborn aides, and decentralizing management were efforts towards long term sustainability and skills transfer and they are indeed proving useful and replicable.

New protocols and courses beyond Neo-anthology and Pediatrics for Medical Professionals is another option and use of Nurse-in-Aid as an important component of SNCU. The placement of 2nd Auxillary Nurse Midwife (ANMs) leads to added manpower for doing home visits for newborn care. This approach is expected to make the difference in newborn care at the community level. However, the referral linkage between IMNCI (Integrated Management of Neonatal and Childhood Illnesses) at home to

SNSU and SNCU at facilities needs to be streamlined.

Up-gradation of all health facility, referral linkages, availability of beds, and a follow up mechanism is necessary with more participation and involvement of the administrative personnel. Increasing the bed strength is necessary to ensure accommodation of all sick newborns including the premature and low birth weight babies.

Strengthening of public sector hospitals for Sick New Care Unit (SCNU) is a desirable action for reasons of sustainability. However, considering resource and time intensity, public-private partnerships can be further explored leveraging with NRHM to support in propagating the excellent effort. Correction of some of these problems will probably help further in improving neonatal care in the SCNU.

A national facility-based newborn care initiative to reduce neonatal deaths in the country was launched by Shri Ghulam Nabi Azad, Hon'ble Union Health and Family Welfare Minister, Government of India on 15 September 2009 at Jaipur and named it as "Navjaat Shishu Suraksha Karyakram". Undoubtedly, the initiative and the replication of these units at a priority speed are very essential to meet the Millennium Development Goals (MDGs).

Comparative Experiences

West Bengal

Purulia Model, Purulia District (From Amitava Sen, Society for Applied Studies, Kolkata)

The purulia SNCU was established in September 2003 at Purulia District hospital. In its first 22 months of operation, the SNCU lead to the reduction in Neonatal Morality Rate of the district by 5 in first year. Neo-natal mortality rate (NMR) in the SNCU has come down to 71 in 2008 from 384 per 1000 admitted sick neo-nates in 2003. The SNCU, apart from providing clinical care, also provides training for paramedical personnel on newborn care. Read More

Madhya Pradesh

Guna Model, Guna District (from Jorge G. Caravotta, UNICEF, New Delhi)

The District Health Society and UNICEF conceptualized the 'Guna model' to ensure a quality continuum of care. The model provides emergency transportation from villages to health care facilities through a round-the-clock call centre. Other services include newborn care units, safe delivery centres and trained birth attendants. The Guna model has been adapted by the Ministry of Health across the state and the Government of Madhya Pradesh has replicated the Guna model in 20 districts. Read More

From Krishna Sahai, State Health Society, Bihar

Bihar

Comprehensive Newborn Care Initiative

The Government of Bihar and UNICEF is in the process of Operationalizing the Comprehensive Newborn Care Initiative. This initiative includes a worker equipped with skills of managing newborn illnesses and advising referral for very sick newborns in every village. In addition, PHCs would be equipped with necessary equipment and capacity to provide essential newborn care to every child born in the PHC. At the district level, a level - II neonatal care unit would provide specialized care to sick newborns.

Replication of Special Care Newborn Units (SCNUs), Vaishali District

The first Special Care Newborn Units in Biharwas set up in Vaishali with support from UNICEF and provide state of the art newborn care that was available only to the richest families in urban areas till now. Government of Bihar has decided to upscale the model in 24 districts. The government has partnered with UNICEF and NNF (National Neonatology Forum) to launch a training package for the Health personnel's posted at these units.

Assam

Decline of neonatal mortality rate after establishment of Sick Newborn Care Unit (SNCU) (from Reeta Bora, Neonatal Unit, Dibrugarh, Assam)

The NMR in the years previous to establishment of SNCU in Assam Medical College was upto 30/ 1000 live births whereas after SNCU was established in 2006, the NMR has declined to 20/1000 live births in the institution. This is an evidence of effective functioning and impact of SNCU. At present 108 ambulance service is available for transportation and stabilization units and newborn corners are being established in the district which is improving the referral. There have been a number of babies who probably have survived because of the SNCU

Chattisgarh

Strengthening and Upgradation of Health Facilties (from Pravin H Khobragade, UNICEF, Chhattisgarh)

The identified 27 Government Institutions were upgraded with facilites and planned keeping in mind the mother - baby pair together. Some of the things that were rensured include functional medical equipment's (including baby warmers), skilled staff (training imparted), operational ambulances for referrals linking it with a call centre. The untied funds from NRHM were utilized to make the facilities have aesthetically good look and provide quality care

Annexure 3

INTERVIEW SCHEDULE FOR THE SCNU HEAD / NEONATOLOGY HEAD

1. Name of the Interviewe_____

2. Name of the SCNU head_____

3. Duration since SCNU has been operational_____

3. Since when are you heading this SCNU? _____

PROGRESS

4 How is the SCNU functioning?

_____

_____

STRENGHTS WEAKNESSES

5 How has the utilization trend changed from inception till date?

_____

6 Any specific changes in utilization trend, which you would like to highlight upon?

7 What were the teething problems you faced during the initial phase of setting-up and operation?

COMMUNITY RESPONSE

8 How is the community response towards SCNU? Do you think there has been a substantial increase in utilization of the SCNU?

9 What is generally the socioeconomic status of the people utilizing SCNU?

10 What are the common constraints people reports in availing the SCNU Facility?

11 Do you think there is a preferential tendency in your community towards seeking health care in case it is a male child?

12 What percentage of the cases do you think are the unnecessary referrals?

13 How much is the average expenditure per day, a family has to bear on the care of child admitted in the SCNU?

CONSTRAINTS and ISSUES

14 What are the major constraints you feel are limiting the functioning of the SCNU?

15 Is there any support that you would like to seek from the UNICEF, NRHM or the Hospital administration or the other departments of the hospital?

HUMAN RESOURCE ISSUES

16 Adequacy of the staff (Yes/ No, answer No if there is Shortage, also mention the reason against the same.

Doctors_____

Nurses_____

Any other staff_____

17 What is the major retention issues pertaining to human resource?

_____

_____

18 What all trainings have been provided to the staff?

_____

_____

19 What are the training needs of the staff?

_____

_____

20 Do you conduct trainings for the SCNU staff or the field staff?

_____

_____

FINANCIAL MANAGEMENT AND SUSTAINABILITY ISSUES

21. How has the role of UNICEF and the NRHM changed over time in terms of supporting the SCNU?

_____

22 Are there any financial constraints in running the SCNU? If yes, the kindly elucidate

_____

_____

23 How do you view the future of the SCNU in terms of its financial sustainability in the

Post NRHM Phase:

_____

Once the UNICEF support stops after a time:

_____

_____

24 Do you think, there should be a user fee or differential pricing for availing the SCNU facility?

INFRASTRUCTURE ISSUES

25 What are the main infrastructure constraints in terms of inability to adhere the facility lay out plan, as prescribed by the UNICEF?

MATERIALS MANAGMENT

What are the main issues pertaining to the:

26 Purchases and procurement of equipments

27 Maintenance and repair of equipments

28 Providing power back up

Stock Maintenance:

29 How frequent is the drug supply to the SCNU?

30 IS there any drug, which you think is commonly required but not available or insufficiently supplied to the SCNU?

31 Any other issues:

DATA MANAGEMENT

32 How is the information management done? how frequently is the data analyzed?

LAB INVESTIGATIONS

33 Do you face any problem in getting the investigations done? Till what time does the hospital lab function?

_____

_____

PERIPHERAL LINKAGES

34 How strong is the counselling component especially at the time of the discharge?

_____

35 How strong is the follow up component in the function of the SCNU?

_____

36 How strong do you think are the peripheral linkages with the field level workers?

_____

LINKAGES WITH PRIVATE PRACTICIONERS

37 How are the linkages with the private practitioners and what sort of response are you getting from their end?

_____

38 What is your view on the PPP for contractual / part time hiring of the private practitioners to cover the human resource gap?

_____

SCALABILITY ISSUES

39 Do you think SCNU is a scalable Model and if yes, then what are the major scalability issues in the process?

_____

SUGGESTIONS

40 Any suggestions you would like to give to improve the functioning of the SCNU?

_____

_____

Any other observation:

INTERVIEW SCHEDULE FOR THE SCNU STAFF

MEDICAL OFFICERS AND NURSING STAFF

Instructions: 1 MO and 2 nursing staff to be interviewed, preferably the ones who have completed at least one year at SCNU

DETAILS OF INTERVIEWEE

1. Name of the interviewee_____
2. Designation in the department_____
3. Total number of years of experience in the neonatology?_____

UTILIZATION AND COMMUNITY RESPONSE

4. How is the community response towards the SCNU?

   _____

5. What is the general socioeconomic status of people coming and availing benefit of the SCNU?

   _____

6. Are most of the patients In born or Out born?

   _____

7. How many beds are filled at any point in time? (Occupancy Rate)

   _____

8. What is the ALOS (Average Length of stay) in the SCNU?

   _____

9. Which areas do the patients come from to the SCNU?

   _____

10. Do you face any problem in dealing with the families of the patient?

    _____

11. What are the common complaints you hear from the patient's family's side?

    _____

    _____

MORTALITY AND MORBIDITY PATTERNS

12. What are the common cases/ Conditions you manage at the SCNU?

    _____

    _____

13. What are the common causes of death at the SCNU?

_____

_____

NARRATION ON WORKING OF THE SCNU

14. How is the SCNU functioning?

_____

_____

STRENGHTS

_____

_____

WEAKNESSES/ CONSTRAINTS

_____

_____

_____

15. If asked to tell point wise, then kindly tell what do you think are the major constraints in the functioning of the SCNU?

_____

_____

_____

SPECIFIC CONSTRAINTS IN WORKING OF SCNU

HUMAN RESOURCE

Availability and Adequacy of the Staff

16. Were you recruited on the permanent basis or contractual Basis? (Permanent /contractual)

17. Were you recruited exclusively for SCNU or are you deputed on rotation basis?

    (Fresh recruited/ Contractual)

18. Adequacy of the staff (Yes/ No, answer No if there is shortage, Also mention the reason against the same.

    Doctors_____

    Nurses_____

    Any other staff_____

Attrition and Retention issues

19. How many Doctors have left the SCNU in the past 2 years? Any reason for the same?

_____

_____

20. How many Doctors have left the SCNU in the past 2 years? Any reason for the same?

_____

_____

Trainings

21. Were you provided any Training before induction or after induction in to the SCNU? If yes, then kindly give the details.

_____

_____

22. Is there any specific area you would like to be trained in? If Yes, then kindly specify

_____

_____

23. Are there any Trainings conducted by the SCNU for the under mentioned. If yes, then kindly specify

Doctors (Yes/ No)_____

Nurses (Yes/ No) _____

Field level staff e.g.; ASHA/ Anganwadi workers (Yes/ No) _____

24. Was the SCNU sent anywhere for the Training. If yes, then kindly specify the details

Doctors (Yes/ No) _____

Nurses (Yes/ No) _____

JOB SATISFACTION

25. Are you satisfied with your current Job?
26. Very satisfied / somewhat satisfied / Not very satisfied / Not at all satisfied/ undecided
27. Reasons for dissatisfaction_____
28. Are you satisfied with the remuneration?

_____

FINANCIAL SUSTAINABILITY OF THE SCNU

29. Do you think, there should be a user fee or differential pricing for availing the SCNU facility? Why?

_____

MATERIAL MANAGEMENT

Stocks and Supplies

30. How is the supply to the SCNU?

Drugs _____

Gloves _____

Syringes _____

31. How frequent is the drug supply to the SCNU?

_____

32. IS there any drug, which you think is commonly required but not available or insufficiently supplied to the SCNU?

_____

Equipments

33. Do you face any issue with the repair of equipments? Kindly elucidate

_____

MISCELLANEOUS

34. I s the cleanliness and Hygiene properly maintained? If No, then Why?

_____

35. Do you face any problem in getting the investigations done? Till what time does the hospital lab function?

_____

_____

36. What all registers and records are maintained by you? Do you maintain any computerized? If Yes, then Kindly give the details

_____

_____

37. Do you think there is a preferential tendency in your community towards seeking health care in case it is a male child?

_____

38. What percentage of the cases do you think are the unnecessary referrals?

_____

39. How much is the average expenditure per day, a family has to bear on the care of child admitted in the SCNU?

_____

40. Is any counselling given to the patient especially at the time of the discharge?

_____

_____

41. Do you ask the discharged cases to come for follow - up? If yes, how many cases turn up for the same?

_____

_____

42. Do you think SCNU is a scalable and a replicable model and if yes, then what are the major scalability issues in the process?

_____

_____

43. Do would you like to give some suggestions to improve working of the SCNU?

_____

_____

Any other observation made by the research team:

Annexure 4

Review of Special Care Newborn Units (SCNU)

Supported by UNICEF

Working towards a healthier India

Indian Institute of Public Health (IIPH- Delhi),

Public Health Foundation of India (PHFI)

PROFORMA FOR FACILITY SURVEY OF A

SICK NEW BORN CARE UNIT,

PRIMARY DATA COLLECTION TOOL

The Primary Data collection tool is on continuum of the secondary tool and is focussed mainly on the Qualitative aspects on the functioning of the SCNU. It attempts to capture both the Beneficiary as well as the Provider's Perspective besides estimating the financial implications.
For clarification on any question feel free to contact:
sutapa.bneogi@iiphd.org, sumit.malhotra@iiphd.org

Time of the Interview:

Place of the Interview:

Name of the interviewee:

Duration of Interview:

Name of the Service Providing Special Care Newborn Unit:

INTERVIEW SCHEDULE FOR THE SCNU BENEFECIARIES

Instructions:

* *Ten cases per SCNU must be Interviewed with five out of the ten cases amongst those who are admitted during the time of the visit and the rest five being the discharged cases within the last three months, to be selected from the Admission/ Discharge Register and captured through the field visit*

* *A Selection mix of the - Out born and Inborn cases must be created. At least, one LAMA and one case of Neonatal Mortality at SCNU must be selected for the community interview*

* *For all interviews Select Father/mother as interviewee; in hospital interviews only if either parent not available then select the attendant present. For community interviews only father or mother. In case of death in hospital select person present in hospital if parents not present at time of hospital stay*

SECTION -A- PARTICULARS OF THE CHILD/ NEONATE:

Hospital Interview: Inborn / Out born (admitted newborn)

Community Interview: Discharged Alive/ LAMA/ Death in hospital (indicate if: Inborn / Out born)

(To be compiled from the registers and not asked of the interviewee)

A.1	Sex of the neonate	
A.2	Place of delivery	
A.3	Date of delivery	
A.4	Weight at the time of birth/at admission	
A.5	Date of admission of the neonate in the SCNU	
A.6	Diagnosis at SCNU	
A.7	Number of days of stay in the hospital? No of days so far (hospitalized cases)/ Total No of days in Discharged cases	
A.8	Date of Discharge (If a Discharged Case)	

SECTION B- PARTICULARS OF THE INTERVIWEE AND THE FAMILY DETAILS

B.1 Name of the interviewee_____

B.2 Age of the interviewee_____

B.3 Relation with the child admitted_____

B.4 Particulars of the family:

B.4.1	Village of the interviewee ,address and contact details (if willing to share)	
B.4.2	Do you possess a BPL card?	Yes/ No
B.4.3	Category	SC/ST/ OBC
B.4.4	Tribal / Non-Tribal	
B.4.5	Educational Status of the mother	
B.4.6	Educational Status of the father	
B.4.7	Occupation of husband and wife	H- w-
B.4.8	Total family income	

SECTION -C Antenatal care

C.1- Obstetric History of the Mother:

C.1.1	Name / Age of the mother	
C.1.2	Primi gravida/ Multi Gravida	
C.1.3	Number of children before this baby?	
C.1.4	(In case a Muti Gravida) Place of birth of previous children.	
C.1.5	How many were born at home?	
C.1.6	How many delivered in a government hospital?	
C.1.7	How many delivered in a private hospital	

C.2 Antenatal History and Delivery History of mother:
(Pertaining to the Admitted Newborn)

C.2.1 Where did the delivery of this (index) child take place: home /hospital?

_____

C.2.2 Why did you choose this place for the delivery of this child?

_____

C.2.3 Did you get ANC check up? Yes/No

C.2.4 If yes, Where did you get the antenatal checks

_____

C.2.5 How many times did you get antenatal checks?

_____

C.2.6 Did any complication occur during the pregnancy, when you were carrying the child? Kindly Describe

_____

C.2.7 Did any complication arise during transportation for delivery? If yes, then Kindly Describe

_____

C.2.8 Did any complication arise during the delivery? Kindly Describe.

_____

Section-D Narrative of illness till hospitalization

Please narrate the entire process (since the time you recognized the symptoms till the time you reached the facility, your experiences at SCNU till the child was discharged)

Please give leading questions in case the following points are not addressed

* *Health seeking Behaviour, Treatment seeking Behaviour*
* *At Home (H/ o Illness, Any Home Remedy if used)*
* *Levels of Care: Initial Treatment / Point of care, Choice of Health care Provider, Point of Referral, Referral History (If there), Care /Treatment given at each level*
* *Role of Health worker*
* *Waiting Time at each level of care and the reason behind the same*
* *Attitude of the Care Provider at each level*
* *If bypassed different levels of care and Why?- in case came direct to the SCNU*
* *Transportation to SCNU (Difficulty In Transportation)*
* *Any other Barrier to Access*
* *Any causes of concern*

Prior to Arrival

Arrival

During the course of Stay

Discharge

SECTION -E - LAMA CASE (FOR LAMA CASE EXCLUSIVELY)

E.1 Why did you take the child back home without getting the case discharged?

SECTION F - DEATH CASE (EXCLUSIVELY, FOR CASE OF NEONATAL MORTALITY)

F.1 Date of discharge

F.2 Date of death

F.3 Where did the child die?

F.4 What was the cause of death, as explained by the doctor and as understood by you?

F.5 What do you think about the care provided at SCNU?

F.6 Do you think life of your child could have been saved?

SECTION G- PARTICULARS OF THE CHILD AS ELICITED DURING THE NARRATION :

G.1	Why was the baby admitted to the SCNU? (As told by the Doctor	
G.2 G.3	Was there any waiting period before the child could be admitted to the SCNU? If Yes, then how much time you had to wait for?	Yes/ No Out born / Inborn Number of hours / days=
G.4	Number of days of stay in the hospital? No of days so far (hospitalized cases)/ Total no of days in discharged cases	
G.5	How many days or months old the baby is? (Present age of the child)	

SECTION H- AWARENESS ABOUT THE SCNU

H.1	Did you know about the presence of a special care Newborn unit before availing the facility?	Yes/ No
H.2	If yes, how did you get this information?	

SECTION- I TRANSPORTATION TO THE SCNU

I.1 Which means of transportation was used by you for coming to the hospital?

Did the delivery take place in the district hospital (in which SCNU is located)? (Yes/ No)

Mode of Transportation - M1, M2, M3

Cost borne on Transportation- C1, C2, C3

To the Hospital for Delivery (In case Institutional Delivery)

	M1	M2	M3	
Eg (Home	Facility1	Facility 2	Site of Delivery	
	C1	C2	C3	

Train /Bus /Govt. Ambulance/ Private Van/ Taxi/ Jeep /Tractor / Personal vehicle

1.2 What personal means of transport used, in case any? _____

1.3 In case government ambulance- Hospital or PHC Ambulance/ EMRI/ Referral Transport for Delivery

To the SCNU

If coming from Home

	M1	M2	M3	
Eg Home/	Facility1	Facility 2	SCNU	
	C1	C2	C3	

If coming from Site of Delivery other than the District Hospital

	M1	M2	M3	
Site of Delivery	Facility1	Facility 2	Site of Delivery	
	C1	C2	C3	

Train /Bus /Govt. Ambulance/ Private Van/ Taxi/ Jeep /Tractor / Personal vehicle

1.4 What personal means of transport used, in case any? _____

1.5 In case government ambulance- hospital or PHC Ambulance/ EMRI/ Referral Transport for Delivery

SECTION- J SATISFACTION WITH THE CARE AND TREATMENT AT SCNU

J.1 Did you face any difficulty in seeking admission to the SCNU? How much was the waiting period before the Admission could be sought?

_____

_____

J.2 Satisfaction with the care being provided to the child in the SCNU.

Treatment at SCNU

J.2.1 Is there any cause of concern about the care provided at this SCNU facility? If Any

_____

J.2.2 Is there any cause of concern/ problem relating to the stay in the hospital?

_____

Attitude of Doctors and Nurses

Was the attitude of the Staff nice towards you?

J.2.3 Attitude of doctors (Yes/ No, Explain.....)

J.2.4 Attitude of nurses (Yes/ No, Explain.....)

J.2.5 Did you find the staff usually available on duty at night? (Yes/ no)

J.2.6 Was the staff generally approachable at night, in case of need? (yes/ no)

J.2.7 How many times do you go and breastfeed your child in 24 hrs?

_____

Communication about the illness

During the course of stay, were you explained about?

J.2.7 Why the child had to be admitted to the SCNU?

_____

After admitting the child, during the course of hospitalization, were you ever explained?

J.2.8Condition of your child (Yes/ No, By the Doctor/ By Nurse, On own/ on querying)

J.2.9 Rationale of treatment (Yes/ No, By the Doctor/ By Nurse, On own/ on querying)

Communication at discharge

At the time of discharge-

J.2.10 Were You given an advice on Home based care or any Dos and Don'ts? If Yes, then Kindly Describe

_____

J.2.11Were you asked to make a follow up visit? If yes, then kindly describe

_____

J.2.12 Reasons for dissatisfaction, if any

_____

SECTION-K COST ANALYSIS - OUT OF POCKET EXPENSES ON AVAILING SCNU FACILITY

(Inclusion/ Exclusion criteria for the cost, if any borne than availing the care at the SCNU)
Includes- The cost borne on purchase of drugs .Any investigations done from outside the hospital.

Cost borne on food and accommodation etc

Excludes- The cost borne on delivery

K.1 Duration of stay _____

K.2 The cost borne on seeking any private consultation prior to coming to SCNU

_____

K.3 Cost borne on transportation to the hospital_____

K.4 Cost borne on transportation to the hospital_____

K.5 Cost calculated in terms of the Number of wage days lost

(No of days absent from work * wage per day)_____

K.6 Were you ever asked to purchase any drug from outside the hospital? (YES/NO)

K.7 If yes, then How often? _____

K. How much was the cost borne on purchase of drugs from outside hospital, if any

_____

K.9 Were you ever asked to get any investigations done from outside the Hospital? (YES/NO)

K.10. If yes, then how often? _____

K.11 The cost borne on getting investigations done from outside hospital, if any

_____

K.12 Overall expenditure borne so far_____

K.13 Total expenditure borne so far (calculate) _____

K.8 Did you have to borrow any money, Yes/No, If Yes, and then how much money you had to borrow?

_____

SECTION- L Any other observation by the research team

Annexure 5

INTERVIEW SCHEDULE FOR THE FIELD LEVEL STAFF

Instructions: At least 2 people should be interviewed

1. Name of the interviewee_____
2. Age of the interviewee_____
3. Category of worker: ASHA / ANGANWAADI/ ANM
4. What is the state of newborns in your area of work/ community?

   _____
5. If any new born falls sick, where do the parents generally take the child to?

   _____
6. 6 Do you think the Sub centres or PHCs are equipped enough to handle basic neonatal emergencies?

   _____
7. Are you aware of the presence of a special unit for care of newborn unit in your District Hospital?

   _____
8. If yes, for how long has the SCNU been operational in your area?

   _____
9. Has anybody in your village availed the SCNU facility? (Yes/ NO)
10. What sort of Experiences you have heard or come across of the families of the beneficiaries who have availed care at the SCNUS?

    _____

    _____
11. How is the community response towards the SCNU?

    _____

    _____

12. What do you think are the major barriers to the accessing the health care at

    District Hospital in general

    _____

    _____

    SCNU in the District Hospital

    _____

    _____

13. Do you think there is a preferential tendency in your community towards Seeking health care in case it is a male child? (Yes/ NO).If yes, Kindly tell in detail

    _____

14. Were you given any training/ Orientation / observer ship about the SCNUs?

    _____

15. Have you received any IMNCI training for dealing with neonatal and child hood illnesses?

    _____

16. What steps do you think must be taken to improve the utilization of SCNU?

    _____


Dräger
Photo-Therapy 4000


Round Table Consultation
Facility Based Newborn Care


SCNU ADMISSION AND FOLLOW-UP AUTOMATION