



**Assessment of SNCU in District
Hospital of Madhubani district,
Bihar**

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INTRODUCTION

According to WHO, India accounts for 30% of the neonatal deaths globally. In India, the neonatal mortality rate is 24/1000 live births. Almost three-fourth of infant deaths occurs within the first four weeks of life. Within NMR (in 4 weeks), almost three-fourth of deaths occur within first week of life.

To strengthen continuum of care and reduce neonatal mortality, India is operationalizing Facility Based newborn care (FBNC) approach. The FBNC model is comprehensive and has been developed with a mindset of delivering quality care at all childbirth points. The components of FBNC are New Born Care Corners (NBCCs) at delivery points, New-born Stabilizing Units (NBSUs) at FRU and SNCUs at district hospitals.

HEALTH INDICATORS

		Bihar	India
Early Neonatal mortality rate		21	18
Neonatal mortality rate		27	24
Post neonatal mortality		11	10
Infant mortality rate	Total	38	34
	Male	31	33
	Female	46	36
Under-5 mortality rate		43	39
Peri natal mortality rate		24	23

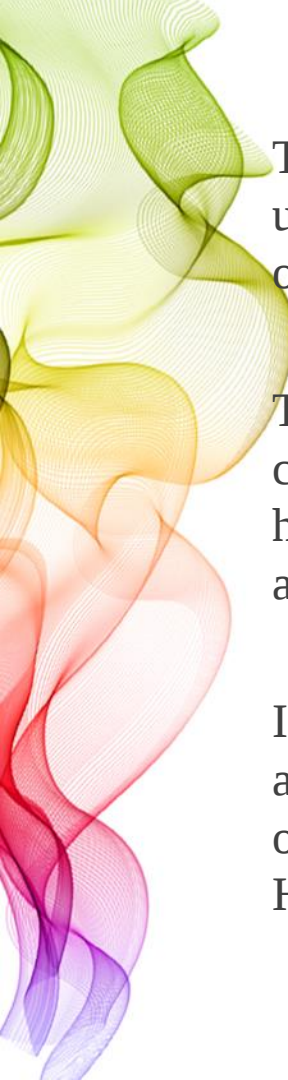
(Source- SRS 2016)



INTRODUCTION

Bihar is a state considered to be a part of Eastern as well as Northern India. It is the 13th-largest state of India according to area with IMR 38/1000 live births; NMR 27/1000 live births (SRS 2016). Preventable morbidities such as prematurity, asphyxia, infections and respiratory distress continue to be the main causes of mortality in neonatal period. District hospital is an important component of community health. It establishes the continuum across different stages of the public health system. Inadequate pediatric care quality puts a negative impact on care seeking by parents, thus putting the effectiveness of health intervention packages to bad shape.

SNCU is designed for premature children, low weight, sick or with some medical condition in early neonatal period to improve survival and decrease neonatal mortality. For health systems in low- and middle-income settings with increasing facility births, district hospitals are the key frontier for improving obstetric and neonatal care, including specific newborn care strategies (Lawn et al, 2013).



RATIONALE

The three major causes of neonatal deaths are preterm birth complications, intrapartum related complications and infections, together, they contribute to nearly 90% of total neonatal deaths.

To address these issues, the facility based newborn care (FBNC) services at health facilities need to be strengthened. SNCU is designed for premature children, low weight, sick or with some medical condition in early neonatal period to improve survival and decrease neonatal mortality.

In order to streamline the activities of SNCU establishment, monitoring, supervision and evaluation and training of human resources, in short, all activities pertaining to operationalization of SNCUs is required. This study aims to assess SNCU of District Hospital, Madhubani in the state of Bihar.



Research Questions

1. What are gaps of the resources (infrastructure, human resources and essential equipment) available at SNCU as compared to the prescribed standard FBNC guidelines?
2. What is the pattern of service utilization of SNCU at DH, Madhubani?
3. What is the status of selected patient outcome and performance of SNCU in terms of Case Fatality Rate (CFR), average length of stay, discharge rate and mortality profile of neonates?



Research Objectives

1. To find gaps out the resource availability in SNCU.
2. To find out the percentages of inborn/outborn babies according to their place of birth, age, sex, birth weight and morbidity profile being admitted in SNCU?
3. To assess the status of selected patient outcome and performance of SNCU in terms of Case Fatality Rate, average length of stay, discharge rate and mortality profile indicators of neonates.



METHODOLOGY

Study area:

Madhubani District, Bihar was selected for the purpose of assessment study.

Study Period:

Study was done from period April'18 to March'19

Study Population:

SNCU of DH, Madhubani, Bihar

Study Design

It is a descriptive study based on documents review.

Sampling Design

Sample size: Records of all children admitted to SNCU from period April'18 to March'19 were studied.

Sources of Data: Hospital/SNCU Records (Monthly SNCU reports/Admission registers/Stock registers) including past records

METHODOLOGY

Methods of data collection

Review of relevant documents were done. Secondary Data from hospital records was used for analysis.

Quantitative information was gathered on the resource inputs provided and available with the SNCU unit and performance of the unit was measured in terms neonatal mortality and morbidity indicators.

Tool of data collection

Checklist and structured questionnaire were developed from FBNC guideline for study.

Data Analysis Plan

Indicators related to following aspects were estimated in this study are-

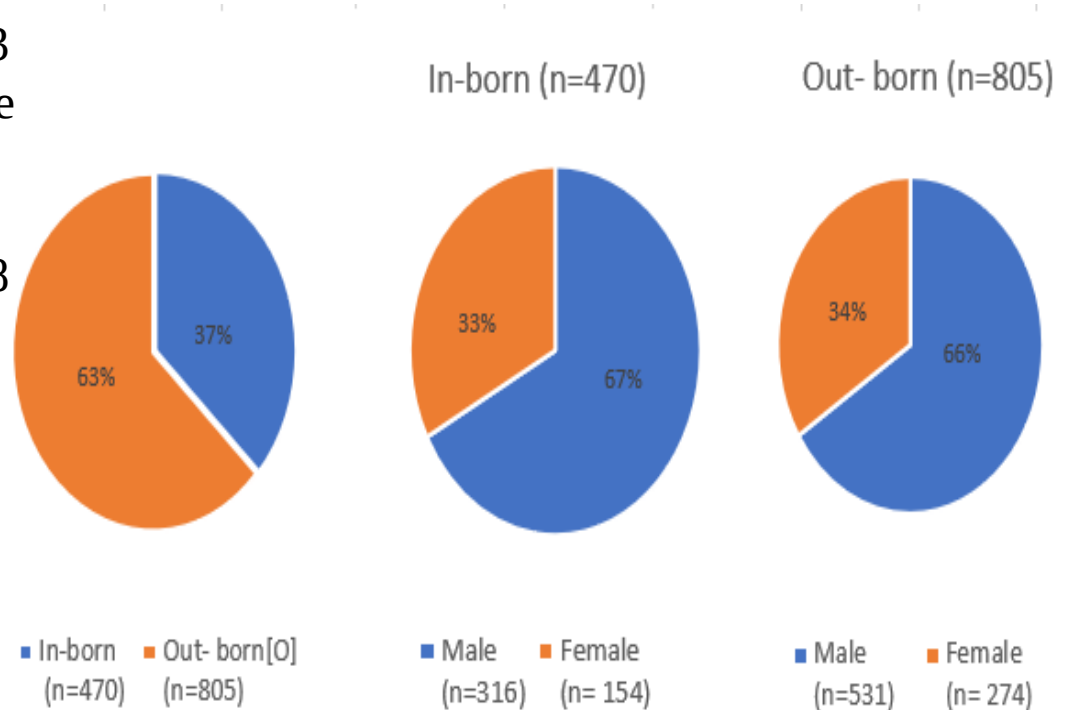
- Service Utilization Indicators includes- percentage of inborn/outborn babies according to their place of birth, age, sex, birth weight and morbidity profile being admitted in SNCU.
- Outcome variable is the average length of stay, discharge rate and mortality profile of neonates.
- Data analysis was done in Microsoft Excel.
- Analysed data was presented in percentage, bar graph and pie charts.

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FINDING AND ANALYSIS OF DATA COLLECTED

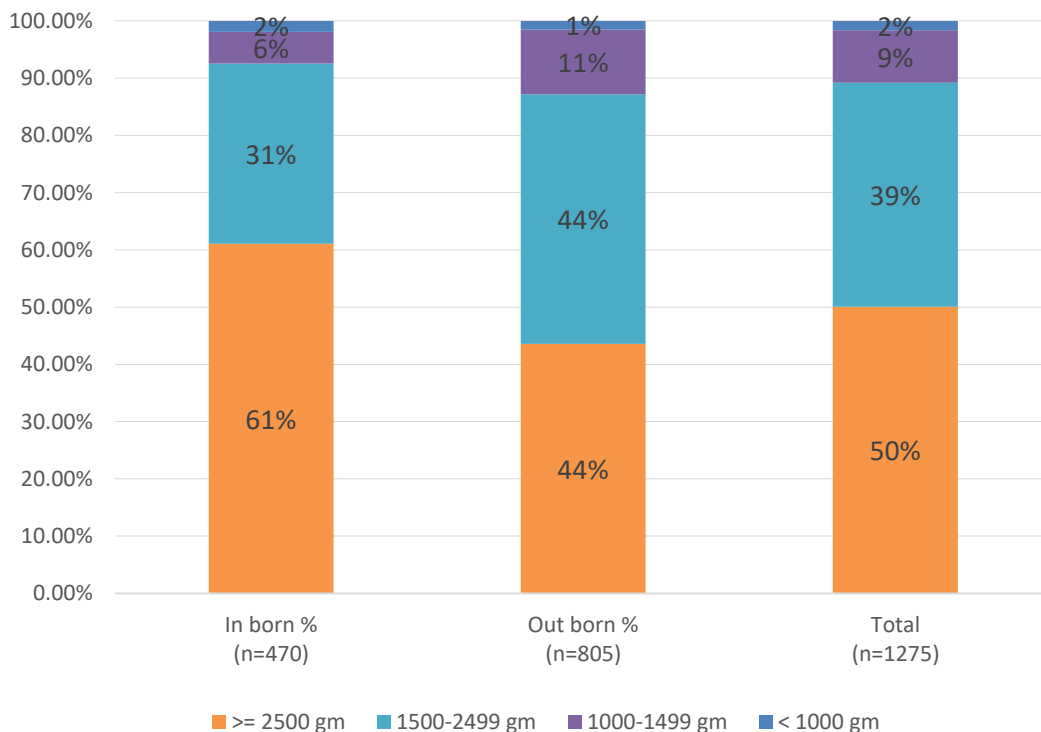
Distribution of neonates based on place of birth and gender

- Among the total admitted children, 63 percent are outborn and 37 percent are inborn. Among inborn, 67 percent are male while 33 percent are females. Similarly, among outborn children, 58 percent are males and 42 percent are females.
- Inference:** The proportion of male children is higher as compared to female children.



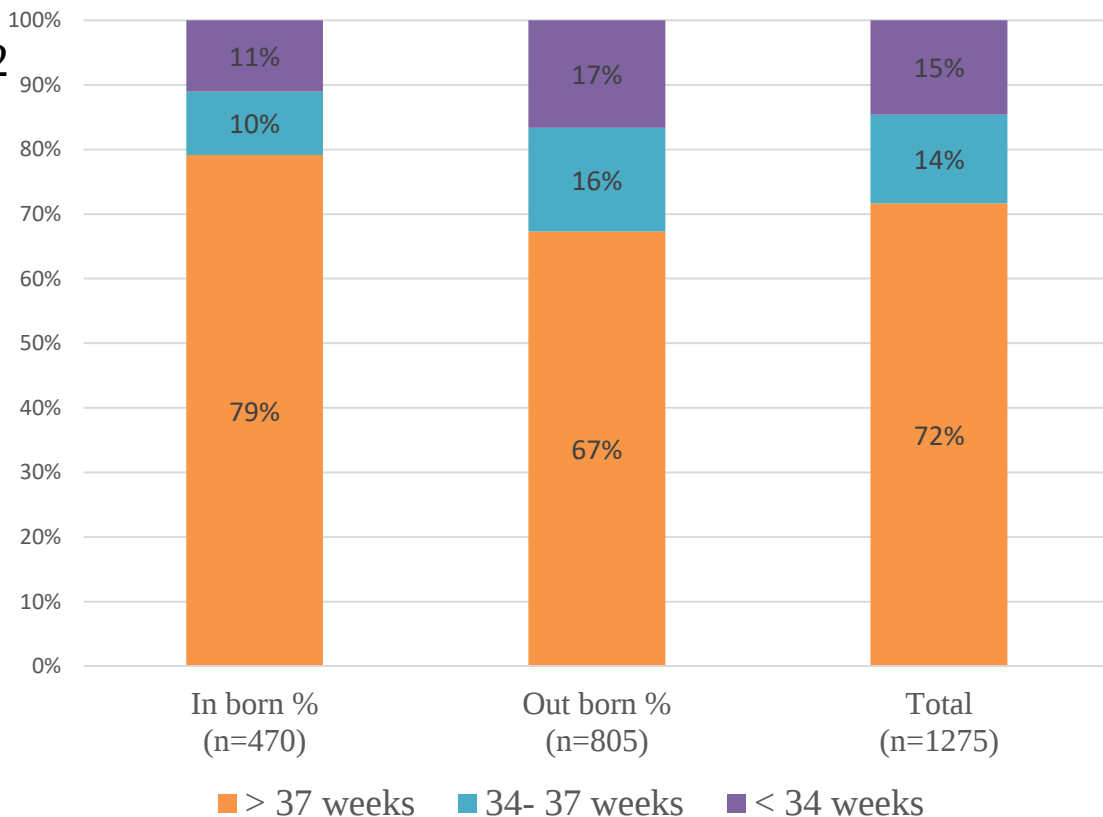
Distribution of neonates based on Birth weight

- Among total inborn admissions, 61 percent neonates are more than 2500 g, 31 percent weigh between 1500-2499 g and 8 percent weighs less than 1500g.
- Among total outborn admissions, 44 percent neonates are more than 2500 g, 44 percent weigh between 1500-2499 g and 12 percent weighs less than 1500g.
- **Inference:** About 50 percent of total admitted children are LBW, including 11 percent which are VLBW children.



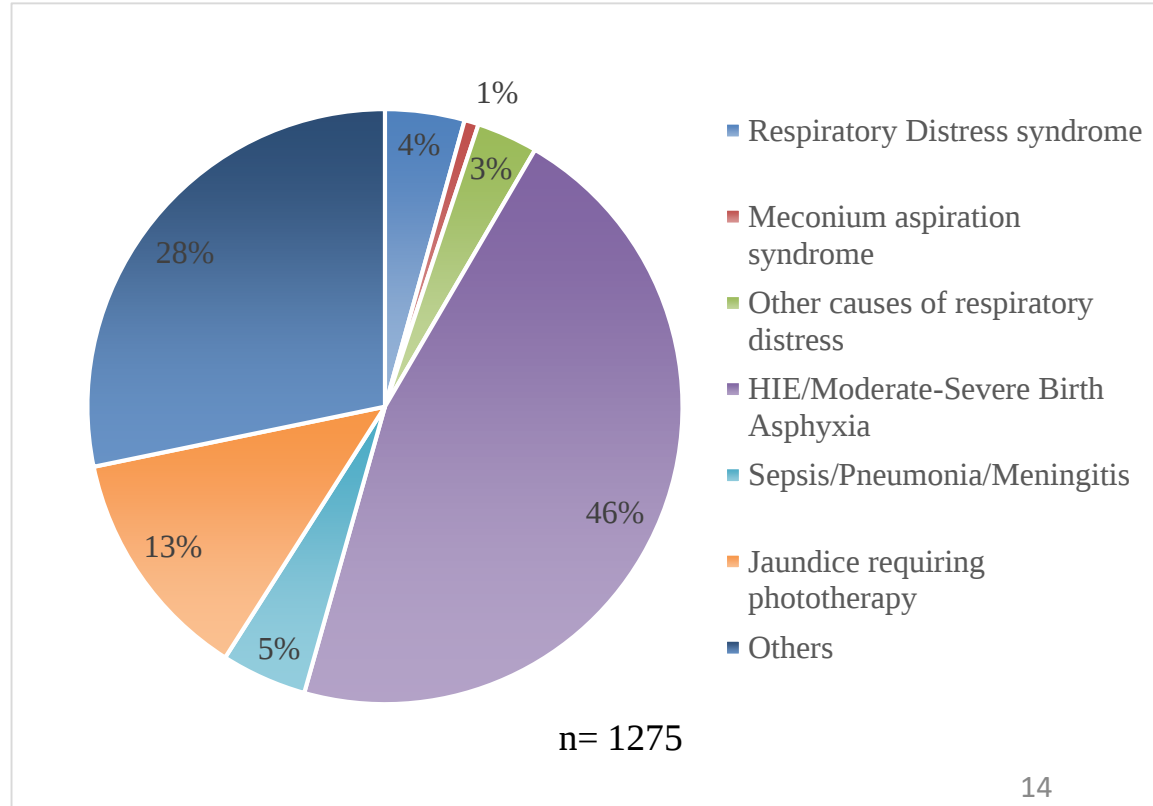
Distribution of neonates based on gestational age

- Out of total admitted neonates, 72 percent are of more than 37 weeks gestational age, 14 percent are between 34-37 weeks and 15 percent are below 34 weeks of gestational age.
- **Inference:** About 29 percent of total admitted neonates are below normal gestational age, including 15 percent premature babies who most likely require intensive care.



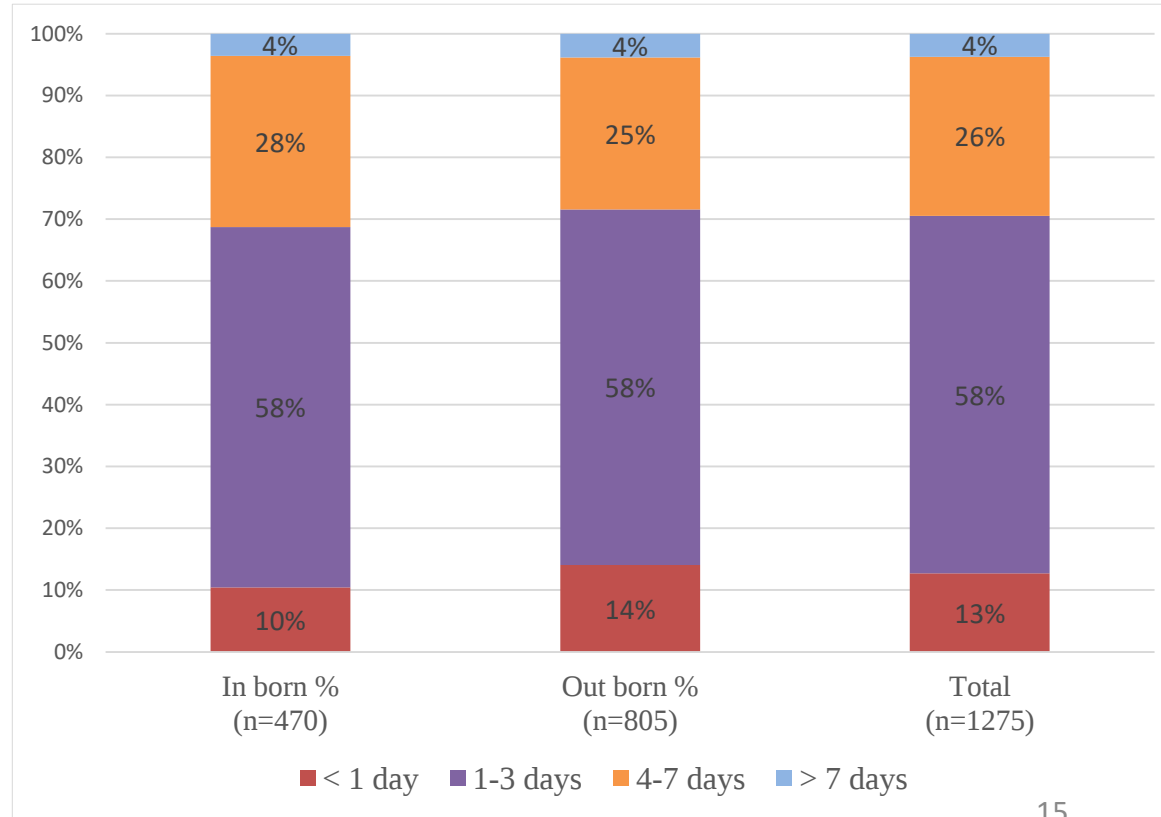
Distribution of neonates based on morbidity profile

- The most common cause of admission in SNCU is birth asphyxia (46 percent), followed by other causes (28 percent), jaundice (13 percent) and sepsis (5 percent)
- **Inference:** Asphyxia, jaundice and sepsis are among the major cause of admission in SNCU.



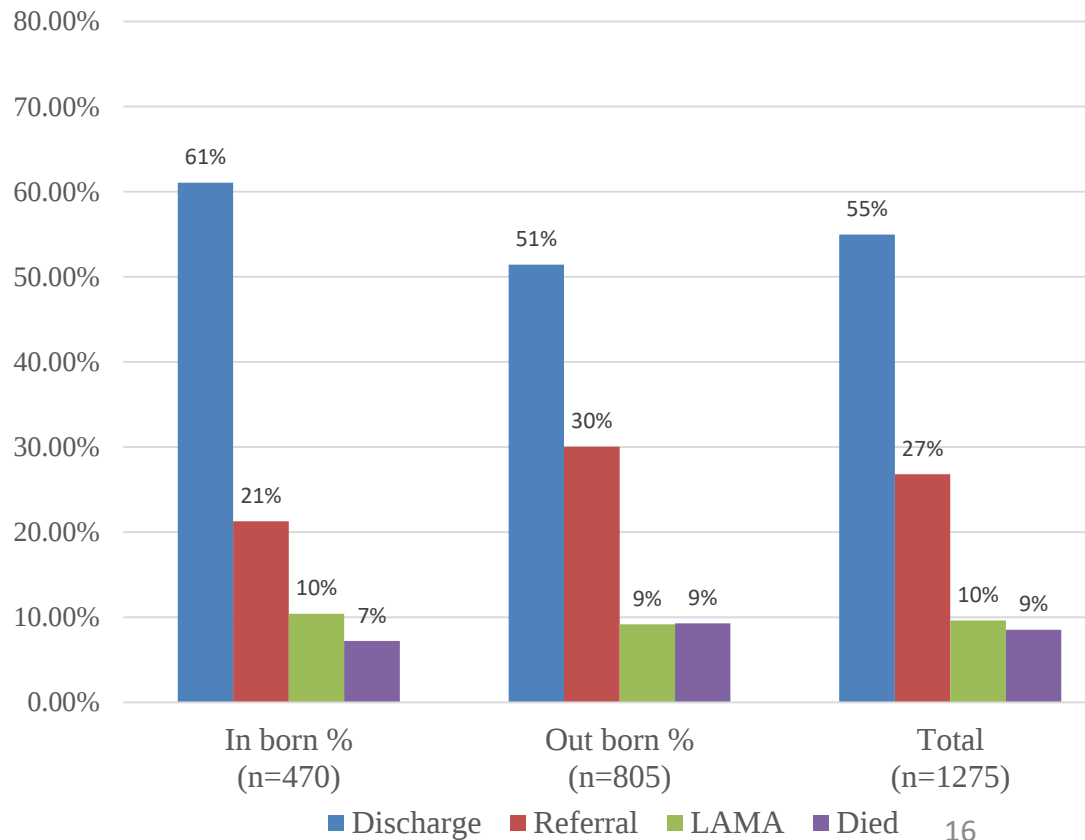
Distribution of neonates based on duration of stay

- Majority of the neonates admitted have duration of stay between 1-3 days (58 percent), followed by 4- 7 days and more than 7 days (30 percent each) and less than one day for 12 percent of neonates.
- **Inference:** Most of the children require short duration of care from 1-3 days, while children requiring more than seven days of care constitute only 24 percent of total admission.



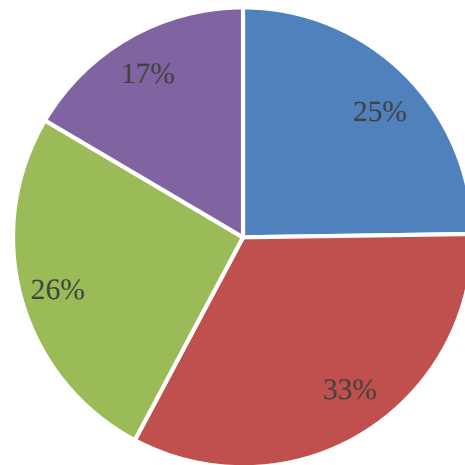
Distribution of neonates based on outcome of Inborn and Out born Admissions

- Among inborn admissions, 61 percent patients were discharged safely, whereas referral and LAMA (Leave against Medical Advice) cases are 21 and 10 percent each. Only 7 percent of admitted neonates could not be saved due to several reasons and complications.
- Among outborn admissions, 51 percent patients were discharged, 8 percent LAMA and 5 percent were referred to higher facilities. Eleven percent patients did not survive.
- **Inference:** Mortality rate among admitted neonates is 7 percent for inborn patients and 9 percent among outborn admitted neonates, which is higher than inborn admissions.



Distribution of neonates based on mortality according to admission weight

- Among total deaths, less than 43 percent were VLBW (below 1500 gm), 33 percent LBW and 25 percent were normal weight children with more than 2500 g weight.
- **Inference:** LBW and VLBW children are at higher risk of mortality as compared to normal birthweight children.

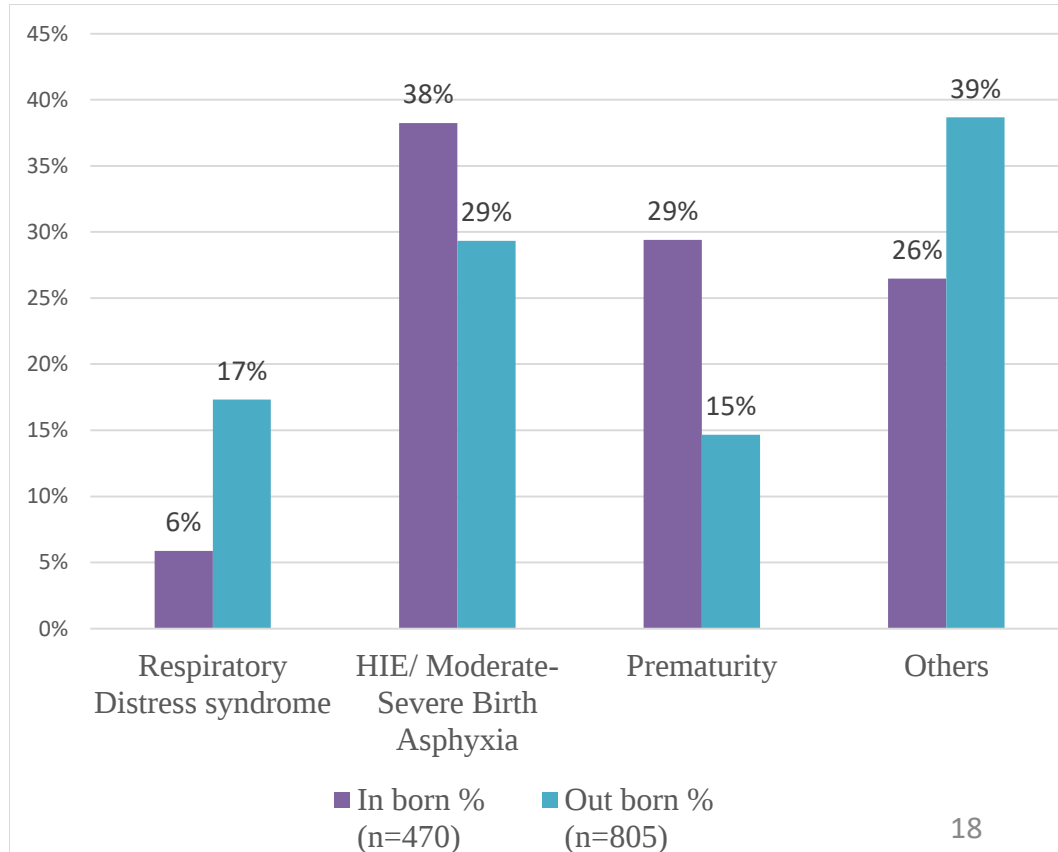


n = 109

■ ≥ 2500 gm ■ 1500-2499 gm ■ 1000-1499 gm ■ < 1000 gm

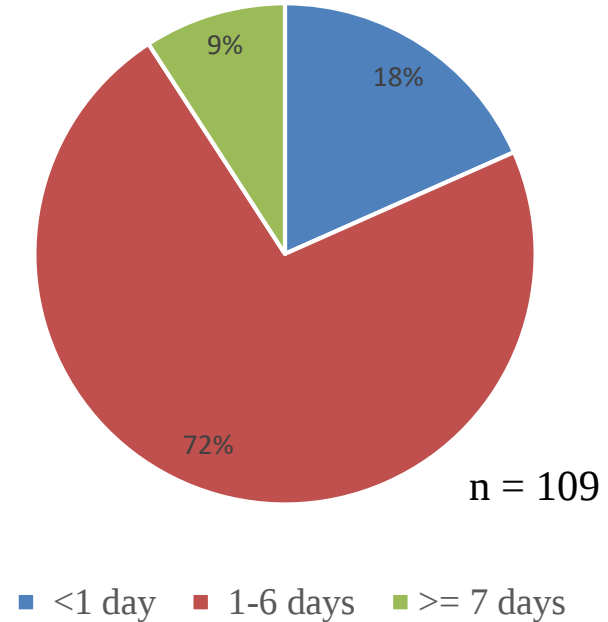
Distribution of neonates based on mortality causes of inborn and outborn admissions

- The cause of mortality among inborn was mainly asphyxia (38 percent), followed by prematurity related complications (29 percent), other reasons (26 percent), and respiratory distress syndrome (6 percent).
- Causes of mortality among outborn patients was mainly other reasons (39 percent), followed by asphyxia (29 percent), by respiratory distress syndrome (17 percent) and by prematurity related complications (15 percent).
- **Inference:** Asphyxia and prematurity constitutes more than 67 percent of total inborn mortality and majority of outborn patient mortality is due to asphyxia and other reasons.



Distribution of neonates based on age of neonates at death

- Most of the neonatal mortality was observed within 1-6 days (72 percent), followed by less than one day (18 percent), and more than one day (8 percent).



Major Findings

- Outborn admissions were more than inborn admissions (~60:40). Both groups were predominated by newborns that were male, normal birth weight, and full term.
- Outborn and inborn admissions were majorly because of asphyxia followed by other causes. and jaundice. Both groups duration of stay was similar to each other. Around 12 % of newborns left the SNCU on 1st day followed by another 58% in 1-3 days.
- Higher proportions of deaths were observed in inborn admissions having birth related complications and prematurity causes accounting for about 67% of the cases
- Nearly 18 percent of children died within one day. This is lesser than national average (24%), but it is still significant.

Availability of services

- SNCU provides all facilities for essential and special newborn care services. According to NNF guidelines, the doctor must be available 24 hour round the clock for quick intervention in case of emergency. However, the doctors were available only on-call in case of emergency and night in facility.
- Laboratory services were only available from 8 am to 4 pm till the OPD timing. After that, patient has to rely on private labs for test.

S. No.	Question	Facility
1	24-hour delivery and newborn care coverage	Yes
2	24-hour duty roster observed and staff present onsite	No
3	Availability of essential newborn care services	Yes
4	Resuscitation services	Yes
5	Thermal care services	Yes
6	Breast feeding support services	Yes
7	Provision of referrals	Yes
8	Provision of 24-hour coverage for newborn care services	Yes
9	24-hour skilled person availability, on call	Yes
10	Availability of immunization services	Yes
11	Availability of essential laboratory services	Yes(Partial)

Human Resources

- The human resource availability at SNCU was found to be adequate. However, as opposed to recommended dedicated faculty, the doctors were also serving paediatric department along with SNCUs, thus sharing time. The nurses, however, were deployed exclusively for SNCUs.
- Support staff were less in number a compared to sanctioned post
- There were no lab technician available for the SNCU

S. No.	HR	Facility	Standard
1	Paediatrician	3	4
2	Nurses	12	14
3	Support Staff	2	4
4	Lab technician	0	1
5	Data Manager	1	1
6	Guard	0	1

Availability of infrastructure and supply

- Facility was reported to have adequate infrastructure and supplies. However, was not having proper drainage system due to which there is issue of water logging in the near-by areas.

S. No.	Infrastructure	Facility
1	Number of inpatient beds in SNCU	12
2	Number of beds in the step down area	6
3	Availability of functional ambulance or other vehicle on-site for referrals	Yes
4	Availability of a mechanism or a system to make phone calls that is available all the time that client services are being offered. E.g. landline, mobile, etc.	No
5	Availability of 24-hour electrical supply (Check to see if electricity can be turned on)	Yes
6	Availability of a backup or a stand-by generator for electricity	Yes
7	Availability of Safe water source with sufficient amount for hand washing	Yes
8	Water outlet within 500 meters of the facility	No
9	Presence of on-site running water	Yes

Availability of equipment

S. No.	Item	Facility	Standard
Monitoring Equipment			
1	Stethoscope with neonatal chest piece	6	12
2	Non-invasive BP monitors	0	1
3	Heart Rate/Apnoea monitor	2	4
4	Pulse oximeter	4(NF)	6
5	Low reading clinical thermometer	3	4
6	Room thermometer	2	12
7	Electronic baby weighing scale	3	4
8	Mechanical baby weighing scale	0	0
Equipment for management			
1	Radiant warmer	13	12
2	Phototherapy unit	5	6
Resuscitation equipment			
1	Self-inflating bag	3	4
2	Foot operated suction pump/mucus trap	1	2
Oxygenation facility			
1	Centralised	Yes	Yes
2	Concentrator	5(NF)	4 24

- Facility was found to have most of the equipment and supplies. Centralised oxygenation facility was available. The missing instruments included Low reading clinical thermometer, room thermometer, stethoscope, spot lamps, computer, inverter, Hemoglobinometer and foot-operated mucus trap.

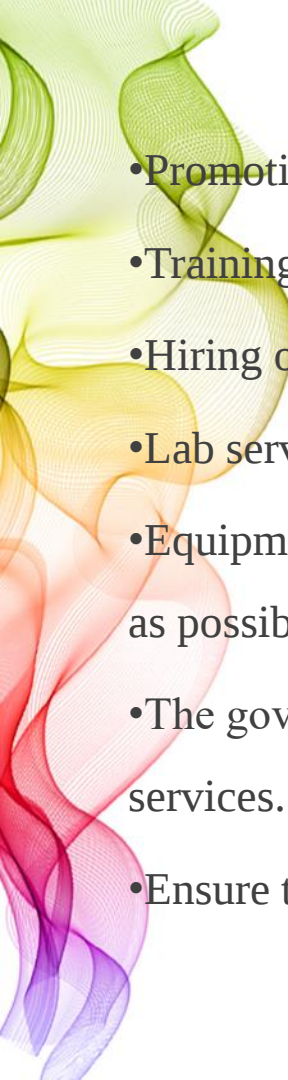
Equipment for investigation			
1	Micro-haematocrit (Hemoglobinometer)	0	1
2	Glucoometer	5	3
General Equipment			
1	Generator	1	1
2	Invertor	0	1
3	Washing machine	1	1
4	Computer	1	1
5	Wall clock with 'seconds' hand	1	2
6	Spot lamps	0	2
7	Air conditioner	10	1
8	Autoclave equipment	1	1 ₂₅



CONCLUSION

Gaps, we found for strengthening of SNCU is crucial to address neonatal mortality and Infant mortality. This study emphasized an utmost need of high skill building training of health personal posted in SNCU with practice of skills in resuscitation is also critical. Availability of functional equipments, optimal skills to use equipments will be important to decrease NMR. Essential equipments and facility-based care are proven interventions for reducing NMR, IMR and still birth rate among sick newborns; it is mandatory public health facility be equipped and made proficient in skills those are employed in SNCU.

There is also a need to review the quality of care at functional SNCU . Periodic inspection and audit are required to assess the availability and functioning of these units. This will help in channelizing resources more efficiently.



RECOMMENDATION

- Promoting partnership with private sector in providing human resource.
- Training of all staff (Doctors and nurses) should be in a regular interval with evaluation of training
- Hiring of human resources including Lab Assistants, guard and support staff.
- Lab services should be provided at the SNCUs.
- Equipment is major part for functioning of SNCU and delay in repair should be minimized as soon as possible, There should be right policy to facilitate maintenance of equipment.
- The government must work on patient trust, most of the parents don't rely on public health facility services.
- Ensure the quality of care and follow up of the babies after discharge from the SNCU.



THANK YOU