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**ABSTRACT:**

A retrospective study was conducted for 2013 -2014 to know the improved and required care of new borne child in SNCU. The major reasons for admission and the major causes of death / referrals were BA, RD, JD followed by sepsis. The pivotal thing was full term babies with above complications were more admitted both years 2013 and 2014. The admission rate showed fluctuation with respect to months with an average of 74.8 in 2013 to 87.33 per month in 2014. The case-fatality rate slightly increased from 7.9% to 8.0%. The unit had nurse: bed ratio of 1:1.6 and doctor bed ratio of 1:6.6. The bed occupancy rate ranged from 121.04% in 2013 and 128.75 in 2014 (median), and the average duration of stay ranged from 9.84 in 2013 and 8.96 in 2014. Even though there is still need to set up and manage quality SCNUs in developing countries.

**Key words:** Retrospective study; Newborn care; SNCU evaluation; Andhra Pradesh

**INTRODUCTION:**

In India, an estimated 26 millions of children are born every year. As per Census 2011, the share of children (0-6 years) accounts 13% of the total population in the Country [1]. An estimated 12.7 lakh children die every year before completing 5 years of age. However, 81% of under-five child mortality takes place within one year of the birth which accounts nearly 10.5 lakh infant deaths whereas 57% of under-five deaths take place within first one month of life accounts 7.3 lakh neonatal deaths every year in the Country. India carries around 24% of neonatal deaths in the world [1]. National mortality rate is 28/1000 live births of India, which constitute two-thirds of infant deaths in India; 45% of the deaths occur within the first two days of life [2]. Therefore neonatal mortality rate comprises major burden of deaths hence making neonatal health care a thrust area of National health mission, which encompass NRHM (National Rural Health Mission) and NUHM (National Urban Health Mission). NRHM Scheme has been launched which covers different aspects of newborn care - Essential New born care, facility based newborn care, home based newborn care. Facility based newborn care has assumed an importance in developing countries owing to its

potential to reduce Neonatal Mortality Rate (NMR) by 23-50% in different settings [3]. Regionalized neonatal/perinatal care with a good network of facilities at various levels has emerged as an effective strategy to tackle neonatal disease burden [4-5]. Evidence supports that in places where regionalization is not present, secondary level units can also lower NMR significantly [6-10]. Establishing neonatal care unit is currently one of the thrust areas to reduce neonatal mortality by 25 to 50% in developing countries like India. Based on that "Facility Based Newborn Care" scheme emphasized on setting up of facilities for care of sick newborn such as-

- **Special New born care Units (SNCUs)**- at least one in each district, with a unit of 12-20 beds, requiring 4 trained doctors and 10-12 nurses for round the clock services.
- **Newborn stabilisation Units (NBUSs)** at community health centres/FRUs- First Referral Units. Each unit has 4 beds with trained doctors and nurses for stabilisation of sick newborns.
- **Newborn care Corners** attached to the labour room and operation theatre (OT) for provision of Essential Newborn Care.

Among these SNCUs have been intended to cater needs for sick newborns, giving “level-2 care” which is required by 10% of newborns. Thus impetus has been given to building neonatal health care infrastructure and training staff for setting up and strengthening SNCUs. These units cater to both inborn and out born sick neonates. The recommended nurse: bed ratio is 1:1.2 while the doctor: bed ratio should be 1:4. It has been estimated that around 15-20% of all newborns require level II care in rural settings (6). This study has been planned to evaluate SNCU in both aspects quantitative regarding equipment, trained human resources and output with respect to admissions and outcome. Thus would help to know gaps in system implementation.

### **METHODS:**

A retrospective study was conducted between periods from 01-01-2013 to 31-12-2014. Here we made an attempt to evaluate the information by considering the various variables, that is baby category (M/F), weight of the baby (LB,NBW,VLBW), term of baby (preterm, full term) and place of delivery (institutional, other), type of admission (BA, O, J, RD, LB, S, T and L) and outcome of the baby (Discharge, LAMA/referral/death) by considering the K sheets available in the MRD section and nominal in SNCU. Chi-square test was used for analyzing the trend of case-fatality rate over a period of two years considering the one year of operationalization as the base. The SNCUs was started and initiated in 2013, Tirupati, Andhra Pradesh. As per the K sheet and an extensive literature review, the above mentioned components were identified for evaluation. The research team visited the SNCU unit to gather the missing information and triangulate the data with personal observations and interaction with the unit staff. Rest of this information was collected on the following parameters: total number of admissions; availability of human resources (doctors and nurses); adequacy and availability of essential equipment, such as radiant warmers, phototherapy units, weighing machines, oxygen concentrators, generator, and air conditioners and their functional status; availability and adequacy of beds; maintenance of asepsis; and morbidity profile and mortality rate among the

admitted newborns. Data were entered in Microsoft Excel Office 2007. The Epi Info software (version 3.5.1) and Excel were used for analysis of data. If any missed it is unable to find.

### **Ethical approval:**

At first the proposal was reviewed and approved by the Research Advisory Committee of Multi-Disciplinary Research Unit (MRU), SVMC, Tirupati, further it obtained Institutional ethical clearance, Lr.No.2212016, dt:51 Mar/2016. Permission was sought from the concerned authorities (SCNU) to collect information, after informing them the purpose of the study.

### **RESULTS:**

New born care, new born care, world is worrying with its inability to reduce in neonatal morbidity and mortality, In which the view of outstanding expertise with real time trouble shoots, the UNICEF and GOVT of India established and establishing SNCU in every state to overcome neonatal morbidity and mortality. Here we noticed the facilities in SNCU like 24-hr delivery and newborn care support, facilities for respiratory support (CPAP, etc.), radio-diagnostics-X-ray (essential) and/or USG/CT (either sourced from the hospital or from an private radiology centre under an MOU), laboratory services (either sourced from the hospital lab or from an private lab under an MOU), immunization services, blood transfusion services, neonatal transport service, 24-hr electricity backup (generator. UPS, solar power, etc.), 24-hrs water supply (either direct or through storage tanks), stores-both medical and general stores, equipments (available in the Unit). Along with this the functional areas required for newborn care are available area per bed (in sq.ft./bed), baby receiving room, breast feeding area, special room for invasive procedures, isolation room (for infected babies), intravenous fluids preparation area, oxygen bay (in standalone facility) or availability of central oxygen, step down room for non-critical /stable babies to stay with their mothers were available. Rest of the interesting points, one is the equipments noticed and mentioned in Table.1.

**Table.1: List of available equipments in the SNCU:**

S.NO	Particulars	Number Currently Available	Number Currently Functional	Number Lying Unused
	<b>Monitoring Equipments</b>			
1	Stethoscope with neonatal chest piece	20	17	03
2	Non-invasive BP monitors	02	02	-
3	Pulse oximeter	05	01	04
4	Low reading clinical thermometers	04	04	-
5	Room thermometers	02	02	-
6	Electronic weighing scale	05	02	03

7	Mechanical weighing scale			
	<b>Equipment for Management of Conditions</b>			
8	Radiant warmer (with Servo control)	19	15	04
9	Phototherapy unit	04	04	-
	<b>Resuscitation equipments</b>			
10	Self inflating bag	09	09	-
11	Foot operated suction apparatus/mucus trap	05	05	-
12	Central O2	19	19	-
13	O2 cylinders	01	01	-
14	O2 concentrators	04	04	-
	<b>Equipments for investigations</b>			
15	Micro hematocrit	-	-	-
16	Dextrometer	-	-	-
17	Multistix	-	-	-
18	Bilirubinometer	1	1	-
19	Microscope	1	1	-
	<b>General equipments</b>			
20	Generators	-	-	-
21	UPS	1		
22	Refrigerator	02	02	-
23	Wall clock with second's hand	02	01	01
24	Autoclaving equipments	02	01	01
25	Surgical instruments			
26	Spot lamps	01	01	-
27	Syringe hub cutters	04	04	-
28	ECG machine			
29	Measuring tape (vinyl coated, 1.5 m)	03	03	-
30	Infusion stands			
31	Air conditioners	07	05	02
32	Heat convectors or hot-air blowers (to maintain ambient temperature)			

Now all the equipments are under jio tagging for service and maintenance. Table.2 and Table.3 provided the data showing the month wise admissions with respect to gender and average duration of stay in 2013 and 2014. Here we attempted to explore the correlation co-efficient month wise of two years; they clearly showed that there is 898 admissions with bed occupancy rate 121.04 in 2013 and in 2014 admission rate is increased to 1049 with bed occupancy of 128.75. Month wise bed occupancy rate ranged from 4.5 to 23.87097, it depends on number of births of that specific month in 2013 with overall 121.04% occupancy in a year and similarly 5.89 to 19.83 with overall 128.75% in 2014. Average length of stay is decreased in 2014 i.e 8.96 compared with 2013 i.e 9.84, this explains the recovery rate of the newborn increased and suggests that maintenance of effective sterile conditions, and sanitation rate, finally treatment

rate has increased. Month wise admission rate is independent of season and its relation to the number of deliveries in that particular month. Human resource data showed in table.4 says that there is 1:1.6 nurse bed ratio and 1:6.6 doctor bed ratio against 1:3-4 in a shift [13]. Table 5 and table.6 shows the results about the overall function strength of SNCU, in 2013 and 2014 respect to preterm and full term babies admitted with various variable including gender, sex, LOS, Various morbidities and discharges, referrals and deaths. There are 299 preterm and 599 full term babies admitted with various morbidities and death rate was 30 (3.34% -preterm) and 41 (4.5% -full term) respectively with over all deaths of 71 ( 7.9%) in 2013. Similarly in 2014, 302 preterm and 746 full term babies were admitted with mortality rate of 25 (2.38%-preterm) and 58 (5.5%-full term) respectively with over all death rate of 84 (8.0%).

Month	Total Admissions	Male	Female	No of days stay	Bed Occupancy Rate	Average length of stay
January	103	58	45	1303	16.6129	12.65
February	82	50	32	715	14.64286	8.71
March	94	54	40	905	15.16129	9.62
April	116	81	35	1142	19.33333	7.8
May	148	83	65	1092	23.87097	9.84
June	71	40	31	835	11.83333	11.76
July	45	30	15	538	7.258065	11.95
August	65	38	27	601	10.48387	9.2
September	27	17	10	307	4.5	11.3
October	52	32	20	528	8.387097	10.1
November	50	30	20	478	8.333333	9.5
December	39	25	14	400	6.290323	10.2
<b>Total</b>	<b>898</b>	<b>541</b>	<b>357</b>	<b>8844</b>	<b>146.7074</b>	<b>9.84</b>

Table.2: Month wise admission and LOS analysis of 2013 with respect to gender.

Table.3: Month wise admission and LOS analysis of 2014 with respect to gender.

Month	Total Admissions	Male	Female	No of days stay	Bed occupancy	Average length of stay
January	37	24	13	368	5.967742	9.9
February	33	19	14	311	5.892857	9.4
March	44	26	18	380	7.096774	8.6
April	112	74	38	1003	18.66667	8.9
May	86	50	36	856	13.87097	9.9
June	96	58	38	909	16	9.4
July	107	69	38	946	17.25806	8.8
August	110	72	38	964	17.74194	8.7
September	119	69	50	1045	19.83333	8.7
October	107	60	46	832	17.25806	7.7
November	104	58	46	1120	17.33333	10.7
December	94	45	49	674	15.16129	7.1
<b>Total</b>	<b>1048</b>	<b>624</b>	<b>424</b>	<b>9409</b>	<b>172.081</b>	<b>8.96</b>

Table.4: Human resource and bed occupancy rate: correlation coefficient

S.NO	Total No Of beds in the unit	Nurse: bed ratio	Doctor : bed ration	Total admissions	Avg. duration (days of stay)	Bed occupancy rate (In %)
2013	20	1:1.6	1:6.6	898	9.84	<b>121.04%</b>
2014	20	1:1.6	1:6.6	1049	8.96	<b>128.75%</b>

There are danger bells toward the death of full term babies % in both the years compared to preterm. The discharge rate increased in 2014 compared with 2013; there are 256 and 676 discharges out of 302 and 746 pre and full term admissions in 2014, whereas 201 and 469 discharges out of 299 and 599 pre and full term admissions in 2013. The admission rate of boy baby is more both in 2013 and 2014 compared with girl admission rate. There are 541, 619 boys and 357, 429

girls are admitted in 2013 and 2014 respectively. This data says that the full term boys have morbidity ratio than girls. The admissions with various morbidities also vary in 2013 and 2014, the incidence of BA, jaundice is low, and sepsis are low in 2014 than 2013, sepsis cases are drastic decrease ie 52 (6%) 2013 to 13 (1.2%) in 2014. Referral and death rate is also decreased in 2014 i.e 32 in 2014 against 157 referrals in 2013, 84 (8.0%) deaths in 2014 against 71(7.9% )

deaths in 2013 (when compared with admissions). The case fatality rate (CFR) with morbidity wise is differing in 2013 and 2014 (Table.7), in case of BA the admission rate is increased 21.0% to 25.26% but similarly the discharge rate increased 79.89 to 88.67%, referral and LAMA decreased from 11.11% to 3.01% and finally the CFR decreased from -8.9% and 8.3% in 2013 to 2014 respectively. In Case of Other morbidities the admission rate is increased 26.83% to

35.27% but similarly the discharge rate increased 77.17 to 88.64%, referral and LAMA decreased from 18.25% to 4.8% and finally the CFR increased from 4.5% and 9.1% in 2013 to 2014 respectively. Where as in Jaundice the admission rate is increased 10.46% to 12.67% but similarly the discharge rate increased 86.17 to 93.23%, referral and LAMA decreased from 12.76% to 6.01% and finally the CFR decreased from 1.06% to 0.7% in 2013 to 2014 respectively.

**Table.5: Chi-square test results with respect to preterm and full term for 2013**

		<b>PRETERM (&lt;36 weeks)</b>	<b>FULLTERM (&gt;36 weeks)</b>		<b>Chi-square test <math>\chi^2</math>(P-value)</b>
<b>GENDER</b>	Boy	172	369	541	1.38 (0.239)
	Girl	127	230	357	
	<b>Total</b>	<b>299</b>	<b>599</b>	<b>898</b>	
<b>Length of Stay</b>	0-10	184	354	538	Not Valid
	10-20	101	193	294	
	20-40	14	52	66	
	<b>Total</b>	<b>299</b>	<b>599</b>	<b>898</b>	
<b>Weight at admission</b>	Lbw <2500	284	325	609	330.78 (0.000)
	Nbw >2500	15	274	289	
	Vlbw<1500	205	42	247	
	<b>Total</b>	<b>504</b>	<b>641</b>	<b>1145</b>	
<b>MORBIDITIES</b>	Birth asphyxia	20	169	189	269.46 (0.000)
	Others	44	195	239	
	Jaundice	28	66	94	
	Respiratory distress	41	100	141	
	Low birth	151	32	183	
	Sepsis	15	37	52	
	<b>Total</b>	<b>299</b>	<b>599</b>	<b>898</b>	
	Referral/lama	68	89	157	
Death	30	41	71		
Discharges	201	469	670		
	<b>Total</b>	<b>299</b>	<b>599</b>	<b>898</b>	

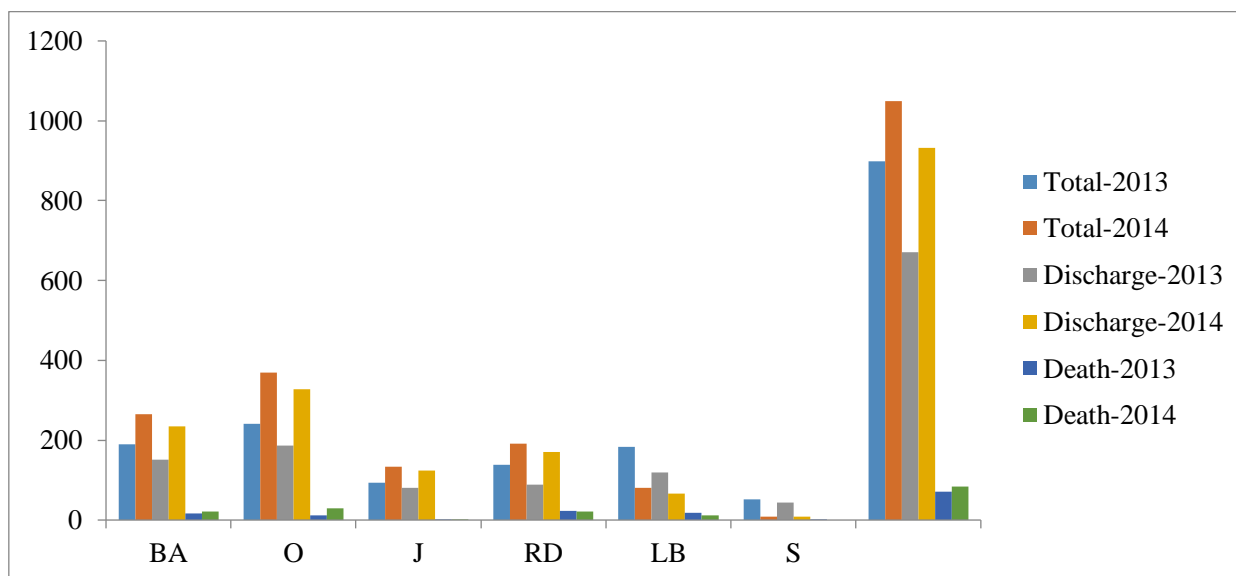
**Table.6. Chi-square test results with respect to preterm and full term for 2014**

		<b>PRETERM (&lt;36 weeks)</b>	<b>FULL TERM (&gt;36 weeks)</b>		<b>Chi-square test <math>\chi^2</math>(P-value)</b>
<b>GENDER</b>	Boy	161	458	619	2.58 (0.108)
	Girl	131	298	429	
	<b>Total</b>	<b>292</b>	<b>756</b>	<b>1048</b>	
<b>LOS</b>	0-10	158	506	664	Not Valid
	10-20	124	222	346	
	20-40	20	18	38	
	<b>Total</b>	<b>302</b>	<b>746</b>	<b>1048</b>	
<b>Weight at admission</b>	Lbw <2500	280	366	646	402.69 (0.000)
	Nbw >2500	13	389	402	
	Vlbw<1500	156	23	179	
	<b>Total</b>	<b>449</b>	<b>778</b>	<b>1227</b>	
<b>MORBIDITIES</b>	Birth asphyxia	15	249	264	Not Valid

	Others	101	269	370	
	Jaundice	36	97	133	
	Respiratory distress	76	116	192	
	Low birth	60	16	76	
	Sepsis	4	9	13	
	<b>Total</b>	<b>292</b>	<b>756</b>	<b>1048</b>	
	Discharges	256	676	932	0.65 (0.721)
	Referral/lama	10	22	32	
	Deaths	26	58	84	
	<b>Total</b>	<b>292</b>	<b>756</b>	<b>1048</b>	

The case fatality rate (CFR) with morbidity wise is differing in 2013 and 2014 (Table.7), in case of BA the admission rate is increased 21.0% to 25.26% but similarly the discharge In Case of RD the admission rate is increased 15.47% to 18.30% but similarly the discharge rate increased 64.02 to 88.54%, referral and LAMA decreased from 19.42% to 0.52% and finally the CFR decreased from 16.5% and 10.9% in 2013 to 2014 respectively. In Case of LB the admission rate is decreased 20.37 % to 7.62% but similarly the discharge rate increased 65.02 to 82.5%, referral and LAMA decreased from 25.13% to 3.75% and finally the CFR increased from 9.8% and 13.7 % in 2013 to 2014 respectively. In Case of sepsis the admission rate

is decreased 5.79% to 0.85% but similarly the discharge rate increased 84.61 to 100%, referral and LAMA decreased from 13.65 % to 0.0% and finally the CFR decreased from 1.9% and 0.0% in 2013 to 2014 respectively, here we observed there is increased pattern of admission in case of BA, Others, J and RD but decreased in case of LB and sepsis. The overall case fatality rate is 7.9% and 8.0% in 2013 and 2014; this shows there is slight increase in overall case fatality rate (Table.7). By comparing the two years, the case fatality rate reduced in various morbidities in 2014 BA, J, RD and S except few others and LB. The death rate in case of morbidity wise showed in fig.1.



**Fig.1. Admission, discharge, death rate of various morbidities in 2013 and 2014.**

Table.7 for 2013-2014. Table.8 explains the inborn and out born admission and deaths with respect to weight of the baby for 2013 & 2014. In Case of  $\leq 1500$  the inborn admission rate is decreased 10.24 % to 3.33 % but out born admission rate increased 12.58 % to 13.72. The outcome assessment in inborn and out born  $\leq 1500$  is 14.1% to 25.71, 8.84 to 5.5 % respectively with overall deaths of 11.21% to 9.49%. In Case of >

1500 the inborn admission rate is decreased 33.07 % to 22.02 % but out born admission rate increased 44.99 % to 60.91. The outcome assessment in inborn and out born > 1500 is 4.71% to 8.22, 8.58 to 7.1 % respectively with overall deaths of 6.92% to 7.70%. Table.9 explains the total inborn and out born admission and its outcome for year 2013 and 2014. In Case of inborn, admission rate is decreased 43.31 % to

25.35 %, but out born admission rate increased 56.21 % to 75.21% with over all admission of 33.64% and 66.35% respectively in 2013-2014. The outcome assessment in inborn admissions increased 6.94% to 10.52% , in case of out born outcome assessment decrease 8.64 to 7.15 with overall increase 8.39 to 8.51 respectively in 2013-2014. However the total outcome assessment is slightly increased 7.90% to 8.0% respectively with overall deaths of 8.47% in two years 2013-2014. Discharges, referrals and death rate are more considerable one in measuring the efficacy of SNCU working even though a lot of limitations in tertiary care government sector. This clearly explains that, there is a progress in SNCU maintenance. However here we need to consider the antenatal care data of mother in relation to Birth Asphyxia, Sepsis, Jaundice, respiratory distress, low birth weight and other morbidities. Increase in admissions was particularly handled by accommodating more than one neonate on each bed. Sometimes the units were operating at a much higher level of capacity than is advisable. The pivotal reasons for this was the increasing the new born care services and awareness of the public for such type of services in tertiary care

settings with free of cost. This indicates the demand for such services in the community in preventing the various morbidities and in reducing the neonatal mortality further to improve neonatal outcomes. Above all explains that the SNCU unit is maintaining world-class aseptic condition strategies in tertiary care hospital. The chi-square test values explains the proportion between gender and term of babies p value is 0.239 in 2013 and 0.108 in 2014, length of stay is not significant and not validated with respect to preterm/full term both in 2013 and 2014. Weight of the baby is also proportional to the term of baby with P value <0.005 in 2013 and 2014. In case of morbidities the P value is proportional to the term of babies, but is significant in 2013 and not validated in 2014, may be due to the antenatal care should be consider. The mortality rate is validated and P value is 0.002 in 2013 and 0.721 in 2014 explained that the term of the baby is significant with the death and discharges and referral but it is independent with gender of baby. Very low birth weight<1500 is most common in preterm babies than full term but admission of full term is more than preterm babies with various morbidities.

**Table.7: 2013-2014 case fatality rate**

Year	Wt of the baby	Inborn N=	X <sup>2</sup>	Out born N=	X <sup>2</sup>	Outcome/death				Total deaths	Percentage of deaths
						inborn	X <sup>2</sup>	out born	X <sup>2</sup>		
2013	<=1500	92(10.24)	Chi-3.769	113(12.58)	Chi-0.037	13(14.1)	Chi-3.6	10(8.4)	Chi-0.6	23(11.21)	Chi-0.048 Pvalue-0.827
2014		35(3.33)	Pvalue-0.052	144(13.72)	Pvalue-0.8474	09(25.71)	Pvalue-0.056	08(5.5)	Pvalue-0.439	17(9.49)	
2013	>1500	297(33.07)	Chi-2.200	396(44.09)	Chi-2.752	14(4.71)	Chi-0.758	34(8.58)	Chi-2.390	48(6.92)	Chi-3.139 Pvalue-0.0764
2014		231(22.02)	Pvalue-0.1380	639(60.91)	Pvalue-0.0971	19(8.22)	Pvalue-0.3841	48(7.51)	Pvalue-0.1221	67(7.70)	

**Table.8: Inborn and out born admissions with respect to weight and death in 2013-2014.**

Year	Inborn N=	X <sup>2</sup>	Out born N=	X <sup>2</sup>	Outcome/death				Total deaths	Percentage of deaths
					inborn	X <sup>2</sup>	out born	X <sup>2</sup>		
2013	389(43.31)	Chi-4.765	509(56.57)	Chi-2.455	27(6.94)	Chi-0.889	44(8.64)	Chi-0.250	71(7.90)	Chi-0.000
2014	266(25.35)	Pvalue-0.0290	783(75.21)	Pvalue-0.1172	28(10.52)	Pvalue-0.3458	56(7.15)	Pvalue-0.6171	84(8.00)	Pvalue-1.0000
Total	655(33.64)		1292(66.35)		55((8.39)		110(8.51)		165(8.47)	

**Table.9. Total Inborn and out born admissions and outcome in 2013-2014.**

Year	Disease	Total Admissions	X <sup>2</sup> value P value	Discharge	X <sup>2</sup> value P value	Referral/LAMA	X <sup>2</sup> value P value	Death	Case fatality rate (Percentage)
2013	BA	189 (21.0)	Chi-0.348	151(79.89)	Chi-0.479	21(11.11)	Chi-4.571	17	8.9 chi-0.209
2014	BA	265 (25.26)	P value-0.555	235(88.67)	P value-0.488	8(3.01)	P value-0.032	22	8.3 p value 0.647
2013	O	241 (26.83)	Chi-1.032	186(77.17)	Chi-0.867	44(18.25)	Chi-7.348	11	4.5 chi-1.92
2014	O	370 (35.27)	P value-0.309	328(88.64)	P value-0.352	13(4.81)	P value-0.007	29	9.1 p-0.166
2013	J	94 (0.46)	Chi-0.391	81(86.17)	Chi-0.274	12(12.76)	Chi-2.579	1	1.06 chi-0.889
2014	J	133 (12.67)	P value-0.532	124(93.23)	P value-0.601	8(6.01)	P value-0.108	1	0.7 p-0.346
2013	RD	139 (15.47)	Chi-0.273	89(64.02)	Chi-4.085	27(19.42)	Chi-16.2 Pvalue<0.0001	23	16.5 chi-1.286
2014	RD	192 (18.30)	P value-0.602	170(88.54)	P value-0.043	1(0.52)		21	10.9 p-0.257
2013	LB	183 (20.37)	Chi-5.143	119(65.02)	Chi-2.189	46(25.13)	Chi-15.207	18	9.8 chi-0.667
2014	LB	80 (7.62)	P value-0.023	66(82.5)	P value-0.139	03(3.75)	P value <0.0001	46	13.7 p-0.4142
2013	S	52 (5.79)	Chi-3.571	44(84.61)	Chi-1.216	7(13.46)	Chi-13 P value-0.0003	1	1.9 chi-2
2014	S	9 (0.85)	P value-0.059	9(100)	P value-0.270	0(0)		0	0.0 p-0.157
2013	Total	898	Chi-11.711	670(74.61)	Chi-1.195	157(17.48)	Chi-9.800	71	7.9 chi-0.00
2014	Total	1049	P value-0.0006	932(88.84)	P value-0.2743	33(3.14)	P value-0.0017	84	8.0 p-1.00

**DISCUSSION:**

Paediatricians/Clinicians play a major role in instructing and observing the aseptic condition in SNCU, which are playing an important role in LOS, sepsis, mortality and in treatment. As in our observation and data, admission and death with sepsis was reduced from 2013 to 2014 and x<sup>2</sup> and P values (chi-2 and p-0.157), where as in BA,O, J,RD, LB the mortality slightly increased with respect to increase in admissions and x<sup>2</sup> and p values in most of cases (chi-0.209 and p value-0.647, chi-1.92 and p-0.166, chi-0.889 and p-0.346, chi-1.286 and p-0.257, chi-0.667 and p-0.4142, and overall chi-0.00 and p-1.00 respectively), it will be observed for further years. The reduced mortality with sepsis in 2014, states that there is lowering of LOS. LOS is very important that of reflects the efficacy and stability of SNCU. Compared with other study, this study showed decreased mortality of BA, jaundice and sepsis, sepsis drastic decrease ie 7 (1.9%) 2013 to 0.0 (0%) in 2014. Referral and death rate is also decreased in 2014 i.e 32

in 2014 against 157 referrals in 2013, 84 (8.0%) deaths in 2014 against 71(7.9%) deaths in 2013 (when compared with admissions), but as per Sutapa Bandyopadhyay Neogi et al 2011, Asphyxia (47%), sepsis (22%), and LBW (17%) were the major causes of mortality in the SNCU units. It was further estimated that health facility based interventions can reduce neonatal mortality by 23-50% in different settings [3]. BA, Others, RD and LB are also major concerns in case of mortality ie 17(8.9%), 11(4.1%), 23(16.5%), 18(9.8%) in 2013 and 22 (8.3%), 29(9.1%), 21(10.9), 11(13.7) in 2014, which in turn reflects the either decrease or increase of NMR. Table.7 and table.8 clearly explains the ratio of morbidities and their case fatality rate for 2013 and 2014. In Inborn and out born admissions with respect to weight and deth in 2013 and 2014, Table.8 shows that, very low birth weight (VLBW (<=1500)) percentage of deaths in 2013 and 2014, In inborn comparison there is more deaths in 2014, 9 (25.71) than 13 (14.1) in 2013 (Chi square value of 3.6 and P value of 0.052) are not



significant. But VLBV out born deaths of 2014 are reduced 08(5.5) than 10(7.84) in 2013 with chi 0.6 and Pvalue of 0.439. Overall VLBW reduced 17(9.49) I 2014 than 23 (11.21) in 2013 (chi-0.048 and Pvalue 0.827) also not significant. With respect to >1500 birth weight percentage of deaths in 2013 and 2014, In inborn comparison there is more deaths in 2014, 19(8.22) than 14 (4.71) in 2013 (Chi squire value of 0.758 and P value of 0.3841) are not significant. But out born deaths in 2014 reduced 48 (7.51%) than 34 (8.58%) with chi-2.390 and P value 0.1221. But overall all >1500 birth weight percentage in 2014 increased 67 (7.70) than 48(6.92) in 2013 (chi-3.139 and Pvalue 0.0764) also not significant. It is interesting to find that the inborn VLBV deaths (14. 1%) more than out born deaths (8.84%) In 2013, whereas out born deaths are low in 2014 than 2013. But over all deth rate is decreased in 2014 than 2013 in VLBW babies. Where as in case of >1500 birth weight percentage in out born has more deth rate than inborn 2013. But in 2014 the >1500 birth weight percentage of inborn are more than outborn deaths in 2014 Table (8) and similarly the overall deth rate is more in 2014 than in 2013 in >1500 birth weight percentage. With respect to over all admissions, Table.9 the inborn deaths are 27(6.94%) in 2013 against 28 (10.52%) in 2014 chi-0.889 and P value-0.3458, where as in out born deaths 44(8.64%) in 2013 against 56(7.15%) in 2014. But over all death rate is slightly more in 2014 (8.0%) than in 2013(7.9). The overall picture shows that there much care is required in decreasing the death rate and addressing in the critical care of neonates. It was demonstrated that strengthening of secondary-level care can lead to significant reduction in mortality among admitted newborns and was further estimated to lead to reduction in neonatal mortality of the entire district [5, 12]. Here we need to take much more focus on antenatal care and baby information at birth in analyzing the morbidities. After careful observation to minimize the mortality it is mandatory to follow duty roster of each human resource persons in SNCU and also commit to follow their manuals, manual for guards, duty manual for sweepers, duty manual for ward boys duty manual for data entry operator, duty manual for pathology Technician, duty manual for nursing staff to reduce some more mortality and increase aseptic conditions and to increase the output of SNCU. Duty doctor place a specialty role in special care, because the aseptic, conditions maintenance depend on their action i.e maintaining and supervising check list of doctors and staff in SNCU. The morbidities and mortalities in SNCU not only depend on the type of admission; it majorly depends on the birth condition and antenatal care of mother. As per our observations whatever the admission in tertiary care hospital is with critical morbidities, as per this experience we will explore and compare the next year's data with antenatal history and birth condition

of baby to find the reasons for morbidities and mortality. There is possibility to decrease all morbidities if we consider the care at primary level.

### **CONCLUSION:**

Two years SNCU data was collected by the research team with direct contact to SNCU team by the permission. The information was collected based on the performance, input & output, functioning of SNCU. We are keeping our main objective on that, the importance of program, implementation of program and output of the program. We clearly noticed that there is vast progress in utilization of facility in care of newborns by means of increasing admission rate, increasing discharge rate, increasing sing discharges of various morbidities except few like RD and Others, decreasing mortality with various morbidities except few like BA, Others, and referral rate. One thing we noticed is irrespective of pre/ full term, the admission rate is more in full term babies with complication of BA, RD, S etc both in 2013 and 2014. With respect to over all admissions, inborn deaths are decreased in 2013 against 2014. but out born deaths increased in 2013 against 2014. But over all death rate is slightly more in 2014 than in 2013. On behalf of this the antenatal care history will be consider in our next study to find the exact reason of BA, RD, S etc. On other hand recovery rate is also decreased by 1% in 2014. There is slight increase (0.1%) in Case fatality rate between 2013-2014. Inborn and out born admissions with respect to weight and death shows the importance of hospital deliveries with SNCU setup to decrease the out born mortality rate. In view of the equipment and human resource consider some more efforts will be needed for much more effective improvement of the unit. This ultimately explores the technology transfer for increasing the rate of neonatal care.

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**List of Abbreviations:** BA- Birth Asphyxia, CFR- Case Fatality Rate, DHR- Department of Health Research, J-Jaundice, LAMA- Leaved against Medical Advice, LB- Low Birth weight, LOS- Length of Stay, MOU- Memorandum of Understanding, MRD- Medical Record Department, MRU- Multidisciplinary Research Unit, NBUS- Newborn stabilisation Units, NBW- New Birth weight, NMR- National Mortality Rate, NRHM- National Rural Health Mission, NUHM- National urban Health Mission, O- Others, RAC-Research Advisory Comitte,

RD- Respiratory, Distress, S- Sepsis, SNCU- Special newborn Care Unit. UNICEF- The United Nations International Children's Fund  
VLBW- Very Low Birth weight

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