

## Awareness and determinants of utilization of “Nischay Yan Scheme” free assured referral transportation services in rural part of West Bengal-India

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### Abstract:

**Background:** National Rural Health Mission introduced ‘Nischay Yan’, a free assured referral transport, since 1<sup>st</sup> April 2011 in Nadia district, West Bengal, India to reduce neonatal mortality rate (NMR). We conducted a cross sectional study to estimate the prevalence of awareness and utilization of the scheme along with factors associated with its use in mothers and to describe the strengths and gaps in the scheme.

**Method:** A total of 575 mothers of children born between 1<sup>st</sup> July and 31<sup>st</sup> December 2011 in 23 clusters were surveyed. Univariate and multivariate logistic regression was done to study the determinants of awareness and utilization of Nischay Yan services.

**Result:** Out of 575 mothers, 77.9% were aware of Nischay Yan and knew the number 102. Majority of the mothers (96.9%) got the information from ANM and ASHA. Only 187 of 575 (32.5%) mothers had availed the services of Nischay Yan. Of the 187 mothers who availed Nischay Yan, 164 (87.7%) utilized it for delivery and 23 (12.2%) for the purpose of neonatal care. ASHA escorted only 42 (22.4%) of 187 mothers. Of the 187 mothers who utilized Nischay Yan, 77% availed the ambulance from doorstep and (82.4%) had to wait up to one hour to get the Nischay Yan. Half of 187 mothers reached a facility in two hours. One hundred seventy one (44%) of 388 mothers did not utilize Nischay Yan because of non availability of the ambulance.

On Univariate analysis mothers characteristics such as age (OR=2.9, 95% C.I.=1.8 -5.1), living in nuclear family (OR=1.7, 95% C.I.=1.03-2.8), Knowing the telephone number 102 (OR=43.9, 95% C.I.=4.7-410.3), Knowing the danger sign for referral of pregnant woman (OR=6.5, 95% C.I.=3.01-14.07), having three antenatal check-ups (OR=21.9, 95% C.I.=2.2-219.5) and Possessing functioning mobile or landline phone (OR=12.44, 95% C.I.=1.3-112.4) were significantly associated with use of Nischay Yan.

**Conclusion:** Majority of the mothers were aware of Nischay Yan scheme while only one third utilized it. Mothers who knew the number 102 and had functioning telephones were more likely to use Nischay Yan ambulance. Major cause of non use of Nischay Yan was non-availability of ambulance. The ambulance density was adequate as per programme but less as per requirement.

**Keywords:** Ambulance, Nischay Yan scheme, Neonatal Mortality, Awareness, Nadia and West Bengal.

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### Introduction

Globally an estimated 130 million babies are born each year and about 4 million of them die in the neonatal period<sup>1-3</sup>. India carries the highest single share of neonatal death in the world that amounts to a quarter of the global neonatal deaths<sup>2,4</sup>. Neonatal mortality accounts for half of all the deaths in all under-fives. India's population policy had set a goal of achieving Neonatal Mortality Rate (NMR) below 20 per 1000 live births by 2010. Neonatal mortality rate in India was 35/1000 live births in 2009 accounting for 0.94 million deaths. The Infant Mortality Rate (IMR) in India has remained high consistently since the early nineties, mainly due to minimal reduction of neonatal mortality compared to achievements in post neonatal mortality<sup>5,6</sup>.

The United Nation's Millennium Development Goal (MDG) - 4 calls for the reduction of under-five mortality rate by two-thirds between 1990 and 2015. In a country like India where over three-fourths of births and most deaths take place at home,<sup>7,8</sup> reaching out to the mother and neonate at home and transporting a sick mother or newborn to an appropriately equipped health facility is key for their survival.

Critical delays in receiving appropriate care include delay in decision making and seeking care in reaching the facility due to long distance to the facility coupled with non-availability or un-affordability of transport.<sup>7,9-12</sup> Studies show that shortened inter-facility transport time leads to improved outcomes for the smallest and most critically ill neonates. Medical transport of this high-risk and critically ill population requires skilled personnel and specialized equipment.<sup>13-15</sup> Emergency referral transport are already in place in India e.g. GVK EMRI in 10 states, Khunti model in Jharkhand, Deepak foundation in Gujrat, Mritunjyot 108 in Assam, Saving life on wheel in MP. In all 33% referral transport is for mother and neonate<sup>12</sup>.

West Bengal has an IMR of 33 per 1000 live births<sup>16</sup> but the rate of decline has stagnated since 2003.

Eighty percent of infant mortality in the state is contributed by neonatal deaths. The state was the first in the country to set up a Sick Newborn Care Unit (SNCU) at the district hospital in Purulia District in September 2003. Following the encouraging results of an interim evaluation of the unit (at least 270 neonatal deaths per year averted in the district hospital alone, which is 7.8% of the estimated 3464 neonatal deaths per year in the district<sup>16-18</sup>.

SNCUs were established in five other districts including Nadia. Even after intensive state level essential newborn care training and operationalisation programme in West Bengal, the NMR has not improved and is currently 24 per 1000 live birth. Studies under the Basic Health Project of 2003, indicate an unmet need of referral transport for mother and neonate in rural areas of West Bengal. From 1<sup>st</sup> April 2011, this need has been addressed by providing every block in the state with an ambulance known as "Nischay Yan"- a free assured referral transport run and managed by NGO partners through the 'District Control Unit' (DCU) that is accessible by a toll free telephone help line 102. Guidelines for the infrastructure and functioning of Nischay Yan scheme have been elaborated to ensure timely transfer of pregnant women and sick neonates to an institution where most complications can be promptly and effectively managed<sup>19-21</sup>.

In order to assess the effectiveness of the recently launched scheme in Nadia District (IMR 60 and NMR 48 per 1000 live births)<sup>22</sup>, it is imperative to know the level of awareness and utilization of the Nischay Yan services at the community level. Further, a formative evaluation of the infrastructure and functioning of the services is relevant for early identification of gaps in its effective implementation in the district. Present study was conducted to study the awareness and determinants of utilization of "Nischay Yan" services and its role in reduction of NMR.

**Objectives:** Present study was conducted with following objectives,

1. To study the awareness of the community regarding availability and role of "Nischay Yan" services.
2. To study the pattern of utilization of "Nischay Yan" services available in the community.
3. To study the determinants of awareness and utilization of "Nischay Yan" services and its role in reduction of neonatal mortality.

### Material and Methods

Present study was conducted in Nadia district of West Bengal. Duration of the study was 6 months. Study was conducted after taking necessary permission from the appropriate authorities.

Community level survey was conducted by using cluster sampling with sub-centre as the primary

sampling unit. A sample size of 575 mothers was calculated to be sufficient to study the objectives within 95% confidence limit and 80% of power. Sample size was calculated by taking in to consideration the awareness of Nischay Yan scheme as 50 percent among mothers, absolute precision of 5% and 1.5 as design effect. A total 575 mothers were selected from 23 clusters. All mothers who delivered a child between 1<sup>st</sup> July 2011 and 31<sup>st</sup> December 2011 were enlisted. In each cluster 25 mothers were selected by using a systematic random sampling.

Data collection was done from 1<sup>st</sup> January to 30<sup>th</sup> April 2012. Data collection was done by using a pretested questionnaire. Data collection was done by trained female graduates. Data was collected from mothers about their socio-demographic profile, knowledge of Nischay Yan, usage pattern of Nischay Yan and reasons for the non utilization of Nischay Yan.

Quality assurance of data collection was done by validating the 10% of the questionnaires for consistency in interview and data collection procedures.

**Data analysis:** Collected data was entered and analysis was done in line with objectives. Mean, median, SD were used as tool to summaries the quantitative data. Percentage and proportion was used to summaries the qualitative data. Chi square, student "t" tests and logistic regression was as test of significance. P value <0.05 was considered as statistically significant. Data management and analysis was done by using Epi-info.

### Results

The age of 575 mothers ranged from 17 to 30 year with a median 21 years. In all 93.6% were housewives, 307 (53.3%) lived in joint family, 387 (67.3%) had education below secondary level and 412(71.6%) were Hindu. The family income ranged from Rs.2000 to 20,000 with a median of Rs. 4000/. (Table-1).

In all, 92.8% underwent three antenatal checkups, 70.4% knew the danger sign of referral of pregnant lady, 27.1% knew the danger sign for referral of neonate, 81.7% had knowledge regarding first referral centre and 92% had either functioning mobile or landline phone.

Out of 575 mothers, 77.9% were aware of Nischay Yan and knew the number 102. Majority of the mothers (96.9%) got the information from ANM and ASHA. Only 187 of 575 (32.5%) mothers had availed the services of Nischay Yan. Of the 187 mothers who availed Nischay Yan, 164 (87.7%) utilized it for delivery and 23(12.2%) for the purpose of neonatal care. ASHA escorted only 42 (22.4%) of 187 mothers. Of the 187 mothers who utilized Nischay Yan, 77% availed the ambulance from doorstep and (82.4%) had to wait up to one hour to get the Nischay Yan. Half of 187 mothers reached a facility in two hours. One hundred seventy one (44%) of 388 mothers did not

utilize Nischay Yan because of non availability of the ambulance.

On Univariate analysis mothers characteristics such as age (OR=2.9, 95% C.I=1.8 -5.1), living in nuclear family (OR=1.7, 95% C.I=1.03-2.8), Knowing the telephone number102 (OR=43.9,95% C.I=4.7-410.3), Knowing the danger sign for referral of pregnant woman(OR=6.5, 95% C.I=3.01-14.07), having three antenatal check-ups (OR=21.9, 95% C.I=2.2-219.5) and Possessing functioning mobile or landline phone

(OR=12.44, 95% C.I=1.3-112.4) were significantly associated with use of Nischay Yan.

After adjusting for potential confounders using multivariate logistic regression the significant determinants of the use of Nischay Yan included mother's age more than 21 years (Adjusted OR=2.6, 95% C.I=1.7-3.9), living in nuclear family (Adjusted OR=1.9,95% C.I=1.3-2.8), knowing the telephone number102 (Adjusted OR=18.3, 95% C.I=3.7-89.8) and knowing the danger sign for referral of pregnant woman (Adjusted OR=3.0,95% C.I=1.6-5.5).(Table-2).

**Table 1: Socio-demographic characteristics of the study participants (N=575)**

Demographic Characteristics		Frequency	Percentage
Age of the mother	18-21 yrs	229	52.2
	22-30yrs	346	47.8
Sex of the neonate	Male	281	48.8
Education status of the mother	Secondary and above	133	23.1
	Below secondary	387	67.3
	Illiterate	55	9.6
Occupation of the mother	Housewife	538	93.6
	Farmer, Labour and service	37	6.4
Occupation of the father	Farmer	209	36.3
	Unskilled labour	135	23.4
	Business	107	18.6
	Skilled labour	85	14.7
	Service	39	6.7
BPL card holder	Yes	214	37.2
Type of house	Kaccha	275	47.8
	Pukka	187	32.5
	Semipukka	113	19.6
No of Children of mother	One child	287	49.9
	Two children	252	43.8
	3-5 Children	36	6.3
Type of family	Joint	307	53.3
	Nuclear	244	42.6
	Extended	24	4.2
Caste	General	316	54.9
	SC	175	30.4
	ST	51	8.8
	OBC	33	5.7
Religion	Hindu	412	71.7
	Muslim	159	27.7
	Christian	4	0.6
Having mobile or landline phone	Yes	524	91.1

**Table 2: Distribution of selected characteristics of study participants associated with the use of Nischay Yan in rural Nadia district of West Bengal, India**

Characteristics	Nischay Yan user (n=187)	Nischay Yan non-user (n=388)	OR (95% C I)	Adj OR (95% C I)
	Number (%)	Number (%)		
Age>21 years	123 (65.8)	152 (39.2)	2.9 (1.8 - 5.1)	2.6 (1.7 - 3.9)
Education up to 10 <sup>th</sup> Grade and above	57 (30.5)	76 (19.6)	1.8 (0.99 - 3.3)	
Occupation as housewife	171 (91.4)	367 (94.6)	0.61 (0.3 - 1.2)	
living in pukka house	55 (29.4)	132 (34.02)	0.8 (0.48 - 1.4)	
Having 3-5 children	12 (6.4)	24 (6.2)	1.04 (0.48 - 2.3)	
BPL card holder	79 (42.2)	135 (34.8)	1.37 (0.9 - 1.9)	
Monthly income up to Rs 4000/-	103 (55.1)	211 (54.4)	1.03 (0.7 - 1.6)	
Nuclear Family	96 (51.3)	148 (38.1)	1.7 (1.03 - 2.8)	1.9 (1.3 - 2.8)
General caste	97 (51.9)	219 (56.4)	0.83 (0.5 - 1.4)	
Religion as Hindu	145 (77.5)	267 (68.8)	1.56 (0.9 - 2.7)	
Know the telephone number 102	185 (98.9)	263 (67.7)	43.9 (4.73 - 410.3)	18.3 (3.7 - 89.8)
≥3ANC visits	186 (99.4)	347 (89.4)	21.9 (2.2 - 219.5)	3.14 (0.3 - 29.7)
Know the danger sign for referral	170 (90.9)	235 (60.5)	6.5 (3.01 - 14.1)	3.0 (1.6 - 5.5)
Mother know the danger sign of referral of neonate	58 (31)	98 (25.25)	1.33 (0.7 - 2.6)	
Has mobile or landline phone	185 (98.9)	342 (88.1)	12.44 (1.38 - 112.4)	1.2 (0.2 - 8)
First referral up to 30 km up & down	181 (96.7)	241 (94.1)	1.75 (0.61 - 5.02)	

## Discussion

Though two third of the mothers knew the telephone number 102 but only one third of them had availed the facility of Nischay Yan. Mothers got the knowledge either from ANM or ASHA. More than ninety percent of the mothers underwent three antenatal check-ups and possessed either mobile or landline telephones. Three fourth of the mothers knew their first referral centre. Mothers, who were more than twenty one years old, living in nuclear family, knew the danger sign of referral of a pregnant woman and knew the telephone number 102 had used Nischay Yan significantly than their counterpart.

In the year 2005, when 'National Rural Health Mission' was launched in, the nation had no functional model of either emergency response systems or assured transport for pregnant women in any state or region. In India, EMS is a relatively new concept, where the most dominant model is the Emergency Management and Research Institute (EMRI) services and is operative in 10 states e.g. Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu, Goa, etc. Some other states like Bihar, Kerala, Himachal Pradesh and Delhi, had adopted EMRI-like model. West Bengal has adopted district based models and it is like Guna model of Madhya Pradesh. States like Madhya Pradesh and West Bengal had opted for basic transportation services (without

stabilization care) in the Public Private Partner mode through multiple agencies (mostly Non Governmental Organizations) contracted at district/block level<sup>23</sup>.

District Control Unit was functioning 24 hours for 7 days. All the call operators were polite with adequate qualification with knowledge of computer. All of them were following the protocol as enumerated in UNICEF's toolkit and Government guidelines<sup>12,19</sup>.

Majority of Nischay Yan had only one driver per 24 hour shift. It was very much less than the norm of one driver in each shifting. So, there was refusal as the drivers were fatigued and this might be one of the reasons of non availability of Nischay Yan. An Evaluation Report on 'Referral Transport System at Block PHCs of Patna, Bihar' showed somehow similar picture<sup>24</sup>. UNICEF toolkit regarding 'Operating perinatal referral transport services in rural India' states that there should be one driver per 8 hour shift. i.e. three drivers per vehicle per 24 hours service and one driver on call should the other driver be unavailable<sup>12</sup>.

As per the UNICEF toolkit, the driver should have passed 10<sup>th</sup> grade and have three years experience in driving<sup>12</sup>. Only half of the Nischay Yan driver had the educational qualification and desirable experience as per the norm.

Though two third of the mothers knew the telephone number 102 but only one third of them had

availed the facility of Nischay Yan. Among the non users, nearly half of the mothers did not get Nischay Yan after calling. Though, as per the scheme there was one ambulance in each block, it was grossly inadequate as per the need of the community. In Nadia there was less than one ambulance per one lakh population. This is in contrast to GVK-EMRI programme of Andhra Pradesh with 0.85 ambulances per one lakh population<sup>25</sup>. Patna study also showed less number of ambulances with respect to the population norm and as a consequence inadequate population coverage<sup>24</sup>.

Median waiting time of the mother to get a Nischay Yan was one hour. Only one fifth of the Nischay Yan user mothers got Nischay Yan within thirty minutes of calling. While GVK EMRI ambulances reach within twenty minutes in urban areas and forty minutes in rural areas in majority of the cases<sup>23</sup>.

An Evaluation Report on 'Referral Transport System at Block PHCs of Patna, Bihar' showed somehow similar picture with Nadia. In the Patna study, as of 'Dial an ambulance 102services', maximum number of clients could manage the transport only after forty five minutes, which could not be in any way termed as emergency transport<sup>24</sup>.

ASHA accompanied only one fourth of the transported mothers. National Health Systems Resource Centre Policy Support Report May 2012, states that 'Deputing and incentivizing a trained ANM or staff nurse or ASHA in the van, for pregnancy dispatches, where travel times are high or labour is advanced, would help provide better care for on-the-way deliveries and deliveries taking place at the pickup point. This is most needed for tribal areas and dispersed populations where turnaround time is very high'<sup>25,26</sup>.

We interviewed mothers of the babies born between 1<sup>st</sup> July to 31<sup>st</sup> December 2011. So, the mothers might not remember the reaching time of the ambulance or the time taken to reach the facility. The mothers also might not remember whether their calls were attended within five minutes or not by the call operator of District Control Unit.

## Conclusion

Majority of the mothers were aware of Nischay Yan scheme while only one third utilized it. Mothers who knew the number 102 and had functioning telephones were more likely to use Nischay Yan ambulance. Major cause of non use of Nischay Yan was non-availability of ambulance. The ambulance density was adequate as per programme but less as per requirement.

**Recommendations:** based on the study findings following recommendations are proposed,

1. To increase the number of drivers for adequate population coverage and timeliness. There should be at least one driver per eight hour shift.

2. To increase the awareness of the mother through telephone.
3. Programme protocol has to be little modified to curtail the percentage of non utilization due to programme protocol.

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**Ethical Consideration:** Study was approved by Institutional Ethics Committee of National Institute of Epidemiology, Chennai.

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