

## Risk Factors associated with unsafe neonatal practices in rural area of Nadia district of West Bengal

Roy Bibhash<sup>1</sup>, Prabhdeep Kaur<sup>2</sup>, Amitabha Dan<sup>3,\*</sup>, Achhelal Pasi<sup>4</sup>, Kunal Kanti De<sup>5</sup>

<sup>1</sup>Deputy Assistant Director of Health Services, <sup>5</sup>Deputy CMOH, West Bengal Public Health & Administrative Services, <sup>2</sup>Scientist D, National Institute of Epidemiology, Chennai, <sup>3</sup>Airport Health Officer, <sup>4</sup>Deputy Airport Health Officer, Airport Health Organisation, Ministry of Health & Family Welfare, Govt. of India, Mumbai

**\*Corresponding Author:**

Email: mumbaiapho@gmail.com

### Abstract

**Introduction:** Neonatal mortality is the main barrier to reduction of infant mortality in West Bengal. Home based simple newborn care by mothers in the neonatal period can reduce neonatal mortality. The practices of mothers in this aspect in Nadia are not known. A cross sectional survey of mothers of Nadia with the objectives of describing their neonatal care practices, determine factors associated with it.

**Methods:** Nadia district has a population of 5 million and estimated pregnancies of 74000. We used PPS method cluster sampling technique. We needed 575 mothers in 23 clusters assuming 52% prevalence at 5% precision, 95% Confidence interval and design effect 1.48. Structured questionnaire was used for data collection on different socio-demographic and health system related factors and mothers' newborn care practices. Data was analysed using Epi info 3.5 software.

**Results:** Among 575 mothers, 518 (90.1%) kept the neonates cord stump clean. Delaying the first bath of the neonate was least practiced 292 (50.8%). Only 39 (6.8%) mothers had all safe practices. Living below poverty line (Adjusted OR 5.2, C.I. 3.4-7.8), not registering in the first trimester (Adjusted OR 2.6, C.I. 1.6-4.2), maternal education not more than secondary level (Adjusted OR 2.3, C.I. 1.3-3.9) and having home delivery (Adjusted OR 3.2, C.I. 1.5-6.8) were significant factors for non-adoption of at least five safe practices. The overall neonatal morbidity rate was 57 per 1000 live births (33/575) and neonatal mortality rate was 10 per 1000 live birth (6/575). Median contacts with the health system in the mothers having unsafe practices was 6 (range 0-11) compared to 10 (range 1-11) in the other group. Out of 33 sick neonates 26 (78.8%) were from mothers with unsafe practices.

**Conclusion:** Poor and uneducated were unaware of safe newborn care practices especially for hypothermia. They had more neonatal sickness and deaths. They had less contact with the health system. There is a need to reach out to such vulnerable group and improve their coverage in existing facilities. Training of ASHA in Home based newborn care and educating mothers can be cost effective option for this section to save neonates by promoting best neonatal practices.

**Keywords:** Risk factors, Unsafe practices, Neonatal morbidity, ASHA, Rural Nadia, West Bengal

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### Introduction

Annually three million neonates die in the world.<sup>1</sup> Three-quarters of them die during the first week of life, 25–45% in the first 24 hours.<sup>2,3</sup> Two third of the world's neonatal deaths occur in just 10 countries, mostly in Asia. Nearly 30% of the global neonatal deaths occur in India, the largest in the world.<sup>1,3</sup> Neonatal deaths in India remain high at 32 per 1000 live births.<sup>1,4</sup> India's National Population Policy had set a goal of achieving an IMR of 30 and NMR of <20 per 1000 live birth by 2010<sup>5</sup>. The major causes of neonatal deaths are prematurity (35%), neonatal infections (24%), birth asphyxia and trauma (23%). Socio-economic determinants include <20 yrs age of the mother (54.2%), less than 2 yrs birth spacing (57.9%) and poverty (122% higher in poorest than

richest)<sup>6</sup>.

In West Bengal, the Neonatal mortality Rate (NMR) is currently 23 per 1000 live births<sup>7</sup>. Overall, 73% of infant mortality in the state is contributed by neonatal deaths. West Bengal has an IMR of 31 per 1000 live births (2010)<sup>7</sup> but the rate of decline has been slow since 2003 when it was 46/1000 live birth<sup>8</sup>. The Government of West Bengal is scaling up its activities to prevent neonatal deaths as it is very close to achieving the MDG target of reduction of IMR<25 per 1000 live births by 2015 which is impossible without reduction of NMR.

Nadia is district in West Bengal bordering Bangladesh. The district has better RCH parameters than the state. The IMR of Nadia district declined from 71 per 1000 live births in 1991 to 54 per 1000 live births in the year 2001<sup>9</sup>. It is estimated that 42% of such deaths (23/100 live births) occur in the first week of life and 15% (8 per 1000 live births) occur within the next three weeks. The estimated NMR of Nadia is thus 31/1000 live births that is higher than the state average<sup>9</sup>.

In Nadia 21% of deliveries occur at home and only 17% institutional deliveries remain in the hospital for 48hrs after delivery<sup>10</sup>. Therefore, there is inadequate provision of care at birth and in the first 48 hours of birth. Mother is the primary caregiver of the child in its very

early days when 80% of the neonatal deaths occur in the first day of life<sup>11</sup>. Evidence from Bangladesh, India, Pakistan, Cambodia, Kenya, Brazil, Bolivia, Senegal, has shown that home visits by trained community workers can reduce deaths of newborns in high mortality, developing country settings by 30 to 61%<sup>12</sup>.

The National Rural health Mission is a flagship program of the Government of India announced in 2005 to strengthen the rural health care system. Under NRHM, all vertical health programs have been integrated to optimize resource utilization and capacity building at the district and state level to respond to health priorities. Accredited Social Health Activist (ASHA) has been recruited to provide linkage with the community to deliver maternal and child health interventions. One of the functions of the ASHA is to train the mothers to provide home based neonatal care<sup>13</sup>.

### Objectives

Present study was conducted with the following objectives,

1. To study the socio-demographic profile of mothers of neonates in rural area of Nadia district of West Bengal
2. To describe the neonatal care practices and awareness of mothers of neonates in Rural Nadia, West Bengal
3. To determine the factors associated with unsafe essential and sick neonatal care by mothers

### Material and Methods

**Study Design:** A cross-sectional survey was conducted among mothers of neonates who were born between 1<sup>st</sup> July 2011 to 31<sup>st</sup> December 2011 in Nadia district of West Bengal, India.

**Study Area & Study Population:** Nadia is the 7<sup>th</sup> most populous district of West Bengal with a population of 5 million which is 5.7% of the state population. Sex ratio is 947, female literacy rate 71.3%<sup>12</sup>.

**Sampling procedure and sample size:** Cluster sampling technique with sub-centres as Primary Sampling Units (PSU) was used. Clusters were selected by using Probability Proportionate to Size method. 52% of mothers practised early breastfeeding and estimated pregnancies were 74,000 in Nadia<sup>9</sup>. Thus, assuming 52% knew correct practice, with 95% confidence interval and absolute precision of 5%, the sample size was calculated to be 575 mothers.

**Data collection:** Data was collected by using a pre-tested semi structured questionnaire.

Data was collected on various socio-demographic variables, neonatal care practice patterns by mothers for the normal child and sick neonate and their interaction with health system during the course of last childbirth to the end of neonatal period of the child.

**Data analysis:** Data was entered and analysed using Epi Info 3.5 and MS Excel software. Objective wise analysis was done by using mean, median, standard deviation and

percentage as statistical tool for numerical and discrete data respectively.

**Human subject protection:** study was approved by Institutional Ethics Committee of National Institute of Epidemiology. Data was collected by taking necessary permissions from appropriate district authorities and written informed consent from study participants.

### Results

**Socio-demographic Profile:** Out of total 575 respondent mothers, maximum (47.1%) were in the age group of 18 – 22 years followed by 31.7% in the age group of 22 – 26 years. Out of 575 mothers, 29 (5%) were below 18 years and 93 (16.2%) were of the age more than 26 years. Out of total 575 respondent mothers 26.3% were illiterate, maximum (39.8%) were educated up to secondary level, 10.3% were educated up to higher secondary level and 3.3% had completed graduation. Out of 575 mothers, maximum (75%) respondents were from Hindu religion followed by Muslim (24.3%) and Christian (0.7%). Maximum (68.5%) respondents were from general community, 28.7% were from Scheduled Caste, 2.1% were from Scheduled Tribe and 0.7% was from Other Backward Caste. More than 80% of the respondent mothers were housewife and 1.2% was doing service. More than 50% of the respondent mothers were staying in Kuchha house, followed by semipucca and pucca. Average per capita family income was Rs 817 only. Maximum (64%) respondent mothers had per capita income in the range of Rs 500 – 1000 and 1.9% had per capita income more than Rs 1500 only (Table 1).

**Risk Factors associated with unsafe neonatal practices:** Out of 575 mothers interviewed, only 39 mothers (6.8%) had all the safe practices. Assuming having all breastfeeding related practices as safe breastfeeding practice and the other five practices as individual ones, 410 (71.3%) mothers did not have at least 5 safe practices. Factors associated with lack of adoption of at least five safe practices were analysed. Education of mother up to secondary level (OR 2.6, C.I 1.6-4.3), having BPL card (OR 5.0, C.I. 3.4-7.3), not registering pregnancy within first trimester (OR 2.9, C.I.2.0-4.4), not being counselled for neonatal care after delivery (OR 2.9, C.I. 1.6-7.7) having home delivery (OR 0.3, C.I. 0.2-0.7) and having less than or equal to seven contacts with the health system during pregnancy /childbirth and neonatal period of the child (O.R.1.8, C.I. 1.02-3.1) were significantly associated with mothers not having at least 5 safe neonatal practices in univariate analysis. The two groups did not differ with exposure to visit by ASHA (Table 2).

Multivariate analysis using logistic regression method was done to study the actual risk factors associated with unsafe neonatal practices. Having a BPL card (Adjusted OR 5.2, C.I. 3.4-7.8), not registering in the first trimester (Adjusted OR 2.6, C.I 1.6-4.2),

maternal education not more than secondary level (Adjusted OR 2.3, C.I. 1.3-3.9) and having home delivery (Adjusted OR 3.2, C.I. 1.5-6.8) remained significant (**Table 3**).

**Table 1: Socio-demographic characteristics of mothers of neonates of rural Nadia district of West Bengal (N=575)**

Characteristics		Number	Percentage	95% CI
Age in Years	<18	29	5.0	3.2 - 6.9
	18 - 22	271	47.1	42.1- 52.1
	22 - 26	182	31.7	27.0 - 36.3
	≥ 26	93	16.2	12.5 - 19.9
Education	Illiterate	153	26.6	22.5 - 30.6
	Primary	115	20.0	17.7 - 22.2
	Secondary	229	39.8	35.9 - 43.6
	Higher Secondary	59	10.3	8.3 - 12.2
	Graduation and above	19	3.3	2.1 - 4.5
Occupation	House wife	468	81.4	76.8 - 85.9
	Agriculture	46	8.0	5.7 - 10.2
	Labourer	13	2.3	1.2 - 3.3
	Service	7	1.2	0.4 - 2.0
	Other	41	7.1	2.5 - 11.8
Religion	Hindu	431	75.0	66.5 - 83.4
	Muslim	140	24.3	16.0 - 32.6
	Christian	4	0.7	0.2 - 1.2
Caste	General	394	68.5	62.6 - 74.5
	Scheduled Caste	165	28.7	23.4 - 34.0
	Scheduled Tribe	12	2.1	0.4 - 3.7
	Other Backward Caste	4	0.7	0.2 - 1.2
Per capita income (Rs)	≤ 500	85	14.8	10.6 - 18.9
	500 - 1000	368	64.0	58.3 - 69.7
	1000 - 1500	111	19.3	14.4 - 24.0
	≥1500	11	1.9	0.5 - 3.2
Type of house	Kutchha	301	52.3	44.9 - 59.8
	Semipucca	121	21.0	17.3 - 24.8
	Pucca	153	26.6	21.0 - 32.2

**Table 2: Risk factors among mothers adopting unsafe neonatal care practices in rural Nadia**

Factors	Mothers not adopting at least 5 safe neonatal practices				OR	95% CI
	Exposed (n=410)		Non Exposed (n=165)			
	Number	Percentage	Number	Percentage		
Age of mother ≤18yrs	25	6.1	4	2.4	2.6	1.0 - 7.0
Age at marriage ≤18yrs	205	50	73	44.2	1.3	0.9 - 1.9
Mother educated up to secondary level	369	90	128	77.6	2.6	1.6 - 4.3
Having BPL card	261	63.7	43	26.1	5	3.4 - 7.3
Per capita income ≤1000	327	79.8	126	76.4	1.2	0.8 - 1.9
Family size ≤4	292	71.2	105	63.6	1.4	0.9 - 2.2
Not registered last pregnancy within 1st trimester	170	41.5	32	19.4	2.9	2.0 - 4.4
Not taken any ANC	38	9.3	7	4.2	2.3	1.0 - 5.4
Had Home delivery	76	18.5	10	6.1	3.5	1.6 - 7.7
Contact with health system ≤7(median)	225	54.9	67	40.6	1.8	1.02-3.1
Not visited by ASHA	175	42.7	63	38.2	1.2	0.8-2.0
Not counselled for neonatal	59	14.4	9	5.5	2.9	1.3-6.6

care after delivery						
Not counselled for neonatal care prior to or during delivery	13	3.1	1	0.6	5.4	0.1-52

**Table 3: Risk factors associated with unsafe neonatal practices in mothers of neonates in rural Nadia district of West Bengal**

Factors	Crude OR	Adjusted OR	95% CI
Having BPL card	5.0	5.2	3.4 - 7.8
Had Home delivery	3.5	3.2	1.5 - 6.8
Not registered last pregnancy within 1 <sup>st</sup> trimester	2.9	2.6	1.6 - 4.2
Mother educated below secondary level	2.6	2.3	1.3 - 3.9
Not counselled for neonatal care practises	2.9	1.3	0.6 - 2.9
Having less( $\leq$ 7 median) contact with health system	1.8	1.2	0.8 - 1.8

### Discussion

The study showed mothers were not fully aware of all the safe newborn care at the household level. This was more pronounced in practices related to prevention of hypothermia in the child. The most prevalent safe practice was keeping the neonatal umbilical cord clean and the least practiced was delaying baby bath after delivery for at least 48 hours. Poverty, lack of education and low utilisation of health facilities available lead to unsafe neonatal care practice. A large proportion of morbidity and mortality of neonates was among mothers with unsafe neonatal care practice. These mothers also had unsafe response to newborn sickness. There was wide variation among mothers in practice of neonatal care.

Most of the neonates had their umbilical cord without any application. This may be due to the fact that majority of the deliveries were in an institution where the cord was clamped. Nadia has a high rate of institutional deliveries which is better than state average. This was consistent with the observations of the Common review Mission 2009 that stated that National Rural Health Mission and "Janani Suraksha Yojana" have had increased the institutional deliveries manifold.<sup>10,15</sup> Almost seven out of ten mothers exclusively breast fed their babies. Breast feeding practices were also good with six out of ten mothers initiating breast feeding within one hour of delivery and seven out of ten exclusively breast feeding their children. This was higher than the 34.9% reported for Nadia in the Concurrent evaluation of NRHM in 2009.<sup>10</sup> The reference period for this study was 28 days of neonatal period while for the concurrent evaluation the reference period was 6 months of age. It is possible that as the child grows up tendency to give extra feeds increases causing a lesser adherence to exclusive breast feeding. We found most of the mothers (87%) were aware of the need for hand washing before holding the child but they did not perceive it to be very important because they thought it was only for cleanliness and did not link it up with chance of infection

which could be fatal. Wrapping the neonate in multiple layers of cloth, holding the baby in skin to skin contact and delaying bath of the child were the least practiced in that order. Most mothers felt that the climate was too hot for wrapping the baby in multiple layers though most wrapped it in one or two layers of clothing. This wrapping also prevented the baby from having skin to skin contact with the mother. About half of the babies were given bath within 2 days of birth to "clean" the children or for some religious or cultural ritual. This makes the child vulnerable to hypothermia. Studies in Bangladesh have shown that motivating the mothers to provide skin to skin care and delaying bath can prevent death due to hypothermia in not only the normal but also the low birth weight neonates. This is not effective if it is not provided for at least 7 hours for the first 2 days.<sup>16,17</sup> The main cause of non-practice was ignorance in case of newer concepts like practices for prevention of hypothermia. For practices like breast feeding, the awareness was good and barrier was in the adoption due to misconceptions among mothers. M Bandopadhyay in her study on four villages of West Bengal has also found misconceptions and rituals to be a barrier in breastfeeding.<sup>18</sup> Mothers and family members responsible for care giving should be specially targeted for removal of hostile perceptions and barriers for improvement of child survival. Also there is need for developing new strategies for health education based on indigenous concerns, addressing socio-cultural barriers.<sup>19</sup>

It was found that the population with unsafe behaviour towards neonates to be different in many aspects from the rest. They were more likely to be poor and mother was not educated above secondary level in most cases. They registered late for pregnancy had more home deliveries and were not counselled by anyone for newborn care after delivery. These characteristics of the mothers made them vulnerable to adopt unsafe practices for routine newborn care. These determinants are important for child survival especially in its neonatal

age. WHO and UNICEF stated that the social determinants of health are poverty, low education of the mother, lower income opportunities and low woman empowerment.<sup>20</sup> Multicultural social interventions in Sub Saharan Africa have shown to reduce child mortality by up to 25 deaths per 1000 live births by addressing social factors and motivating people<sup>21</sup>.

### Limitations

One of the limitations was cross sectional design and therefore mothers might have difficulty in recalling the practices.

### Conclusion

Mothers lack knowledge about importance of keeping baby warm and have misconceived ideas about correct breastfeeding practices and hand washing. Poor and uneducated had higher risk of unsafe practices. Unsafe practices were associated with poor health system contact as indicated by lack of institutional delivery, late ANC registration and infrequent contact with health care providers. Mothers with lack of safe practices had most of the neonatal sickness and death.

### Recommendation

Targeted IEC with specific messages of need for warmth for the neonate, importance of hand washing and myths regarding breast feeding. Early registration, ensuring the institutional delivery, regular follow up using mother and child tracking system and counselling during each contact should be the targeted at marginalized group of poor and uneducated. Number of vehicles for Nischay Yaan to be increased with special emphasis to ensure non exclusion of hard to reach areas. ASHA recruitment and training in module 6 and 7 to be completed. Increase Home based newborn care awareness among mothers can be a cost effective way of promoting safe neonatal practice and reduction of neonatal mortality and morbidity.

### References

1. Organisation WH. Children: Reducing mortality. 2012 June 2012 [cited; Available from: <http://www.who.int/mediacentre/factsheets/fs178/en/#content>.
2. World Health Organisation: UN interagency group for Child Mortality Estimation. Levels and trends in Child mortality. Geneva; 2011.
3. World Health Organisation. Neonatal and perinatal mortality. Country, regional and global estimates. Geneva: WHO 2006.
4. Dadhich JP P. State of India's newborns. (NNF, 2004):13-4.
5. National commission on population. National population policy 2000. New Delhi: Govt of India.
6. National Family Health Survey (NFHS-3), 2005-06: India: International Institute for Population Sciences; 2007.
7. Registrar General I. Sample Registration System Statistical Report 2010; 2012.
8. Registrar General of India. Sample Registration System bulletin. New Delhi: Registrar General of India; 2011.
9. United nations Development group. West Bengal Human Development Report. 2004.
10. Government of India. Concurrent Evaluation of NRHM. In: Welfare DoHaF, editor. New Delhi; 2009. p. 321-31.
11. J E Lawn SC, J Zupan, for the Lancet Neonatal Survival Steering Team. 4 million neonatal deaths: When? Where? Why? Lancet. 2005.
12. WHO U. USAID, Save the Children (2009) WHO-UNICEF Joint Statement: Home visits for the newborn child: a strategy to improve survival. Geneva: World Health Organization.
13. Government of West Bengal. Rolling out of ASHA module 6 and 7. In: NRHM Mission Director, editor. Kolkata; 2011.
14. India Go. Provisional population Totals Paper 1 of 2011: West Bengal. In: Affairs MoH, editor. New Delhi Government of India; 2011.
15. Government of India. National Rural Health Mission. New Delhi: Ministry of Health and Family Welfare; 2009.
16. Sloan NL. Community-Based Kangaroo mother care to prevent neonatal and infant mortality. Columbia: Columbia University Mailman School of Public Health; 2007 30th September 2007.
17. Ahmed S, Mitra S, Chowdhury A, Camacho L, Winikoff B, Sloan N. Community Kangaroo Mother Care: implementation and potential for neonatal survival and health in very low-income settings. Journal of Perinatology. 2011;31(5):361-7.
18. Bandyopadhyay M. International Breastfeeding. International breastfeeding journal. 2009;4:2.
19. Ghosh R. Child mortality in India: a complex situation. World Journal of Pediatrics. 2012;8(1):11-8.
20. UNICEF WHO. Countdown to 2015 Decade report World Health Organisation, Geneva; 2010.
21. Grace Malenga MM. The Millennium village's project. Lancet. 2012;379(9832):2131-3.
22. Government of India. Report of the Steering Committee on Health for the 12th year plan. In: Planning Commission Health Division, editor. 2012.
23. Government of India. Facility based newborn care: Guidelines for planning and implementation, New Delhi; 2011.
24. Government of India. Emergency Medical Service in India: A concept paper. In: National Health Resource Centre Ministry of Health & Family Welfare, editor. New Delhi; 2009.
25. Baqui AH, El-Arifteen S, Darmstadt GL, Ahmed S, Williams EK, Seraji HR, et al. Effect of community-based newborn-care intervention package implemented through two service-delivery strategies in Sylhet district, Bangladesh: a cluster-randomised controlled trial. The Lancet. 2008;371(9628):1936-44.
26. Bang AT, Reddy HM, Deshmukh MD, Baitule SB, Bang RA. Neonatal and infant mortality in the ten years (1993 to 2003) of the Gadchiroli field trial: effect of home-based neonatal care. J Prenatal. 2005; 25 Suppl 1: S92-107.
27. Gogia S, Ramji S, Gupta P, Gera T, Shah D, Mathew JL, et al. Community based newborn care: A systematic review and meta-analysis of evidence: UNICEF-PHFI series on newborn and child health, India. Indian paediatrics. 2011;48(7):537- 43.
28. Agrawal P, Agrawal S, Ahmed S, Darmstadt G, Williams E, Rosen H, et al. Effect of knowledge of community health workers on essential newborn health care: a study from rural India. Health Policy and Planning. 2011.
29. Biswas AB, Mukhopadhyay DK, Mandal NK, Panja TK, Sinha N, Mitra K. Skill of Frontline Workers Implementing Integrated Management of Neonatal and

Childhood Illness: Experience from a District of West Bengal, India. *Journal of tropical paediatrics*. 2011;57(5):352-6.