CURRENT STATUS OF NEONATAL CARE AND ALTERNATE STRATEGIES FOR REDUCTION OF NEONATAL MORTALITY IN THE DECADE OF NINETIES

S.K. Bhargava
S. Ramji
H.P.S. Sachdev

The National Health Policy has defined three goals, namely, reduction in infant mortality rate, reduction in perinatal mortality rate and reduction of low birth weight as major objectives related directly or indirectly to a neonate. It is well established that almost 50-60% of infant and perinatal mortality is contributed by neonatal deaths(1) and low birth weight is a major contributor to neonatal mortality. The prevalance of preterm birth varies from 7-16% and that of low birth weight (<2500 g) from 10-56% in the country(2).

The infant mortality rate has shown a consistent decline from 127 to between 90-95 per 1000 live births in the last decade(1). This fall has been largely due to decline in post neonatal mortality and there has been hardly any contribution by decrease in neonatal mortality. The perinatal and neonatal mortality rates have continued to remain between 30-80 in most of the States of the country. Only the States of Kerala, Jammu and Kashmir, and Goa have recorded a mortality rate of 30 or less. What has been worse and extremely disconcerting are the trends between 1970-85 which have shown virtually no decline in almost all the States(1).

Comparison of socio-economic (such as poverty, female literacy) and health statistics amongst different States and Union Territories of the country highlights the fact that the perinatal and neonatal mortality rates are not dependent on a single factor. For instance, a comparison of Haryana and Kerala shows that whereas there are only 16% below poverty line in Haryana as compared to 27% in Kerala, the neonatal mortality in the two States are 55 and 21, respectively. Similarly, there are only 15 Trained Birth Attendents/1,00,000 in Haryana as against 53 in Tamil Nadu, yet the mortality rates are same. One finds similar observations(3) for female literacy, fertility rate, nurses, *etc.* in many States (*Table I*).

Status of Neonatal Care

The delivery of health care in our country is affected in the rural area through Sub Centre, Prmary Health Centre (PHC), Community Health Centres, which are believed to be supported by Taluk and District Hospitals. The health functionaries supposed to be provided include a Village Health Guide, Trained Dai, Female Multi-Purpose Worker, Health Assistants, General Medical Officers and Specialists in Internal Medicine, Surgery, Obstetrics and Gynecology, Pediatrics and Anesthesia with a 30 bedded inpatient facility at Community Health Centre.

The number of health units (Sub Centre, Primary Health Centre and Community Health Centres), Trained Dais, Auxillary Nurse Midwives *etc.*, have in the last 7 five years plans risen from tens to hundred folds with Sub-Centre and

Reprint requests: Dr. S.K. Bhargava, Consultant Pediatrician, D-7 Gulmohar Park, New Delhi 110 049.

TABLE I—*Comparison of Socio-economic Factors and Perinatal/Neonatal Mortality in Selected States of India*

State	Population below poverty line	Female literacy rate	Nurses 100,000 population	Professional birth attendents	Mean age at marriage	Total fertility rate	PNMR 1985	INMR		IMR
								Rural	Urban	
Kerala	27	66	62	74	22	2.1	24	21.0	22.9	31
Haryana	16	22	15	77	18	5.0	33	55.1	57.3	85
West Bengal	39	30	18	34	19	3.9	39	49.7	41.0	74
Punjab	14	34	92	68	21	3.8	41	38.6	34.0	71
Karnataka	35	28	17	49	19	3.8	41	51.8	47.8	69
Bihar	50	14	11	21	17	5.9	45	59.1	46.5	106
Madhya Pradesh	46	16	17	28	17	5.1	51	78.8	61.9	122
Rajasthan	34	11	17	17	16	5.7	51	72.5	56.3	108
Tamil Nadu	40	35	53	57	20	3.3	54	56.3	50.3	81
Andhra Pradesh	36	20	24	47	17	4.0	55	57.2	48.0	83
Gujarat	24	32	16	49	20	4.0	58	69.0	54.0	98
Uttar Pradesh	45	14	8	24	18	5.9	59	74.4	68.8	142
Orissa	42	21	13	19	19	4.3	72	77.2	63.9	132

Primary Health Centre facilities increasing from thousand to over hundred thousand(4). The outlay expenditure of Family Welfare programme has increased from 1st plan in 1951-56 of few crores to over 500 crores in 7th Plan. But, these plans and increase in Primary and Sub-Centre health care facilities have not made a significant dent in perinatal and neonatal mortality in the last 30 years. It could be concluded that the present Maternal and Child Health Programmes are unlikely to effect a change in the present situation.

The Indian Council of Medical Research (ICMR) survey of over 100 PHC and Sub Centres have shown that the antenatal and intranatal care, the two key determinants of pregnancy outcome, lack even the basic facilities such as weighing scale, BP recorder, urine analysis, Hb estimation and delivery in such Centres; even pregnancy registration is less than 40%(5).

Results of the ICMR National Collaborative study(5) have shown that less than 40% of the population perceive ANM (Female Multi-Purpose Worker) as a Maternal and Child Health worker. It further showed that while a Dai visits 25% of women and newborns postnatally, the Government health functionaries such as Doctor, ANM, *etc.* account for less than 10%.

Home delivery remains the way of child birth in most rural and urban areas of the country, conducted by Dai and/or relatives. The knowledge on basic care of a newborn such as environmental temperature control at birth, hand washing, tying of cord, oropharyngeal suction, feeding,

recognition of high risk infant remains woefully inadequate amongst health functionaries meant to deliver primary newborn care. In urban areas, the situation is worse with no structured or tiered health delivery infrastructure for the delivery of perinatal, neonatal care and Maternal and Child Health care.

The newborn remains a subject of total neglect by administrators, professionals, politicians and even by families who take the death of a neonate as 'God's wish'. The neglect is glaringly visible with not even a single excellent satisfactory neonatal unit in the country with 26 million births and 8 million low birth weight infants and over a million neonatal deaths annually.

That, the situation can be improved dramatically is reflected in the leading causes of neonatal deaths such as birth injuries, aspiration syndrome, and neonatal infections such as tetanus, pneumonia and diarrheas, which contribute to over 50% of such deaths(7). Undoubtedly, the single most underlying and contributory cause for neonatal deaths is the high prevalence of low birth weight and preterm births. But a large proportion of low birth weights are over 1800 g and preterm births at 36 weeks of gestation(2) which can be managed at home or at primary level with provision of essential physiologic needs such as warmth, feeding and basic nursing care for prevention of infections.

Alternate Strategies

There are several studies demonstrating that maternal, perinatal, neonatal and child health services can be delivered successfully with reduction in mortality rates at an acceptable level. The features common to such studies are a continued commitment to the community, community participation in decision making and monitoring, health care based on felt needs of the community, a tiered system with linkages and referrals from domiciliary, village level to hospital, and most importantly a link health worker from the village itself irrespective of age, caste, sex and education but motivated and committed to the programmes (*Table II*).

It is thus apparent from a review of the current status of infant and neonatal mortality, its determinants and delivery of perinatal and neonatal services that if objectives of National Health Policy for 2000 AD are to be achieved, corrective and appropriate action and interventions need to be mandatorily introduced in the current decade for maternal and neonatal care. The policy of increasing the Sub Centres, Primary Health Centres, Community Health Centre and Trained Birth Attendents has so far not affected the maternal or pertinatal outcome. The following areas need to be accorded the highest priority:

A. Delivery of neonatal and perinatal care at primary, secondary and tertiary level.
B. Training and education of all categories of health functionaries including medical, nursing, para-health workers such as FPMW, Dai and Village Health Guide in perinatal and neonatal care.
C. Improving community participation by involving the community in all decisions regarding the kind of medical care, perinatal and neonatal care, health education and monitoring of such services on selective appropriate parameters.

A. Delivery of Neonatal Care

The delivery of neonatal care has to be

TABLE II—*Evaluation of Perinatal Care—Community Based Studies*

Name	CHDP Pachod	UPASI Nilgiris	SEWA Rural Gujarat	AWARE Andhra Pradesh
Year started	1977	1971	1980	1975
Population covered	70,000	250,000	35,000	975,000
Organization				
–Health delivery	Base hospital Health posts Home delivery	Hospitals Clinic Home	Hospitals Moblile Dispensaries Vilage health post	Community health centre Mobile clinic Base Hospital
–Health Functionary	Doctors, ANM PHN, Nutritionist, MPWS, CHWS, Trained Dais	Doctors, Community Link Workers	CHVS, AWWS, TBAS, Doctors, MPW, ANMS	ANM, Dai, VHWS, Doctors
–Link Worker	CHWS	CLW	CHV	VHW
–Tiered Referral System	Yes	Yes	Yes	Yes
Training	High priority	High priority	High priority	High priority
Community Participation	Active	Active	Active	Active
Supervision	Constant interaction	Constant interaction	Constant interaction	Constant interaction

Programme indicators	% cases							
	1978	1984	1971	1984	1980	1986	1979	1988
ANC	0	70	42	80	0	60.95	5	50
Referral	1.5	8	42	80	-	-	-	-
Delivery by trained Dais	6	60	0	80*	25	85	3	30
Maternal mortality	12	2	-	-	-	-	-	-
NMR	96	45	-	-	-	-	-	-
IMR	120	70	119	48	164	61	110	65

* Institutional

Other Projects: CINI–Calcutta; RUHSA–Tamil Nadu; KEN–Vadu, Pune; Mini Health Centre–Madras

linked to total perinatal care, extending from prepregnant condition, to antenatal, intranatal and postnatal. It is imperative that the care of the pregnant women, delivery and child birth and newborn and infant care become comprehensive integrated services and not to be treated in isolation, as is the situation even today. It would be more logical to provide neonatal care through the existing health services or a National Health Programme. However, if this is not possible then it may be worthwhile to even create a new national programme of perinatal and neonatal care. The perinatal and neonatal care should be provided through a triage or three tiered system of primary, secondary and tertiary care as recommended by the Task Force on Minimum Perinatal Care of the Government of India, Ministry of Health and Family Welfare, 1982(8).

(i) Triage or Three Tiered System of Neonatal Care

It is an accepted and acknowledged reality that all newborns irrespective of their birth weight, gestational age and place of birth need care at birth and in the first few days of life. The triage or three tiered system as recommended by the Task Force on Minimum Perinatal Care(8) is intended to maximally utilize the available resources for appropriate care.

Approximately 80-85% of all newborns need primary or Level I care, 15-20% Secondary or Level II care and 1-5% Tertiary or Level III care. The envisaged indications for various levels of care are depicted in (*Table III*).

(ii) Neonatal Care Through Existing Rural Health Delivery System

The currently available services have made no impact whatsoever on the maternal, perinatal and neonatal morbidity and mortality. The Sub-Centre and Primary Health Centre are hardly providing antenatal, intranatal, delivery or neonatal services. The Female Multi Purpose Worker has failed to provide antenatal, intranatal, postnatal and neonatal care and the community does not any more perceive her as a maternal and child heath care worker. It is, therefore, necessary to accept this realistic situation and perhaps provide services at village level rather than at Sub-Centre level. Occurrence of 80% of delivery at home by a trained Dai or untrained personnel including relatives is to be accepted. Therefore, training of whosoever in conducting delivery, should be ensured and basic amenities, supplies for antenatal and intranatal provided preferably to the family or to the health functionary. The link between the community and the health delivery system may be created through a Village Health Guide from the community. A Female Multi-Purpose Worker with accountability and responsibility for MCH care needs to be provided separately. The supplies for antenatal, intranatal, postnatal and newborn care should be provided as per the recommendation of the Task Force of the Ministry of Health and Family Welfare and Indian Academy of Pediatrics recommendation.

Alternatively, the neonatal care at primary, secondary and tertiary level can be incorporated in existing National Health Programme such as the Post Partum Programme.

(iii) Neonatal Care Through Post partum Programme

The existing Post Partum Programme

TABLE III—*Indications for Appropriate Level of Care for Newborn Infants*

Level I	Level II	Level III
Term or post term with normal weight	Weight 1301-2000 g or >4000 g	Weight ≤ 1300 g
Clinically normal	Gestation 33-36 weeks	Gestation <33 weeks
Apgar Score >8	Moderate birth anoxia	Severe birth asphyxia (Apgar <3)
Uncomplicated course in early neonatal period	Respiratory distress	Severe respiratory distress
	Infants with abnormal behavior or weight patterns	Critically ill neonate needing life support systems
	Infants with metabolic, hematological or any other problem	Infant with major malformations.
	Neonatal hyperbilirubinemia	

could be extended to include perinatal and neonatal services. The reason for this suggestion are:

1. It is an ongoing National Programme related to family welfare.
2. It is based on a team approach of the main disciplines. It also has adequate para-medical staff and a statistician to monitor the services.
3. It provides mobility with its own vehicle and thus has the most crucial component for success of this programme. This facility can be extended to provide primary MCH care at village level.
4. The Post Partum Programme has an inbuilt reporting system. This could easily be expanded to include parameters for monitoring MCH services including perinatal and neonatal care.
5. It provides immunization and can thus easily cover infants for immunization and growth monitoring.
6. Post Partum centres can be utilized for training of Dais, Village Health Guide, Auxillary Nurse Midwives for field practice areas. The training programme could be collaborated with Family Welfare Training Centres to provide a comprehensive training in perinatal, neonatal, infant and Family Welfare Programme.
7. The programme provides physical facilities for care of women undergoing sterilization as well as operation theatre facilities. These could be strengthened to provide delivery facilities and neonatal care units.
8. The programme uses camp approach for family welfare programme. These again could be used for mass immunization, health education and such other outreach programmes for the community. It thus offers an opportunity to seek full community participation and hence fills a major lacunae in the existing health services system.
9. It is proposed that district level hospitals and all Post Partum units at sub-divisional level provide mainly primary neonatal care and Type A (more than 3000 births/annum) secondary level care. Tertiary care neonatal units can be established on a regional basis in Type A institutions.

This programme, therefore, has the potential to approach the community in a most realistic human way by offering a package of maternal and child health services with family welfare care after child birth; neonatal and infant care and promotion of family welfare practices in a positive way.

(iv) **Other Alternatives**

(*a*) Another alternative to improving perinatal and neonatal care is to incorporate it as a major objective of the existing Integrated Child Development Services programme. This programme is now expected to cover 3000 Blocks. In recent years, some casual or half hearted efforts are being made to include perinatal and neonatal care as part of this programme. A clear cut, well defined policy will be needed in the care of the pregnant women and newborn is to be affected through this programme. It is possible to utilize this welfare programme at the community level as it has the necessary infrastructure and more importantly provides the key for success of community at the grass root level. However, the programme will need strengthening in delivery of actual perinatal and neonatal health care with provision of a midwife or Dai for delivery at home and a referral system for primary, secondary and tertiary care.

(*b*) The Universal Immunization Technology Mission can be converted into a maternal and child health Care Technology Mission. This would appear to be a most practical and rational method of providing not only immunization to pregnant women and children but comprehensive MCH care including perinatal and neonatal care. A further extension could be to include care of the girls from school years in this programme. It would then be possible to begin health education of the girls from early years and prepare them for their future roles and lifes. The Programme would thus encompass on health and sex and family planning in school years; care of the pregnant women during antenatal, intranatal and postnatal period; and care of the infant after one month which can be extended upto three years. The Programme can then be linked to the Integrated Child Development Services and the Post Partum Programme. National Programmes such as the Maternal Anemia Prophylaxis, Oral Rehydration Therapy, Acute Respiratory Care and Vitamin A administration should become part of this programme with additional provision for strengthening the perinatal and neonatal care as recommended by the Government of India Task Force on Perinatal Care and Maternal Mortality and the Indian Academy of Pediatrics. Thus, it would not only be possible to preserve and utilize the experience covering this programme to dealing with the crucial issues of improving the health, knowledge and attitude of the girls, but also provide quality oriented antenatal, intranatal and neonatal care and bring all the existing national maternal and child health care programmes under one fold.

B. Training and Education in Perinatal and Neonatal Care

It is acknowledged that the present education and training programmes at primary level for health functionaries, medical students, nursing students have failed to provide appropriate training.

The proposed alternative Programme of Perinatal and Neonatal care can provide training from grass-root to tertiary level. As a matter of fact with a clear mandate and commitment it should be possible to

develop regional, neonatal and perinatal centres, Level II centres and those at primary level to fulfill the needs. The regional institutes can be asked to co-ordinate the total activity.

C. Community Participation

Community leaders nominated by the community could be the member of the Central Committee to monitor the perinatal and neonatal services. The Central Committee through the community leaders could identify the need of the community in perinatal and neonatal care and provide it. By their participation it should be possible to ensure utilization of the services as these would meet some of their felt needs.

Monitoring Perinatal Neonatal Services

It would be most crucial if objectives of 2000 AD are to be achieved, that the perinatal and neonatal services in antenatal, intranatal, postnatal and neonatal period be monitored on selected parameters objectively.

REFERENCES

1. Registrar General of India, Sample Registration System 1976-78, 1980-85, Vital Statisties Division, New Delhi.
2. Bhargava SK, Sachdev HPS, Iyer PU, Ramji S. Current status of infant growth measurements in the perinatal period in India. Acta Pediatr Scand 1985 (Suppl 319): 103-110
3. Ramji S. Socio-economic and environmental determinants of perinatal and neonatal mortality in India. Indian Pediatr 1989, 26: 1100-1105.
4. Health Information–India. New Delhi, Directorate General of Health Sciences, Ministry of Health and Family Welfare, Government of India, 1989, pp 92-134, 151.
5. Bhargava SK, Singh KK, Saxena BN. A National Collaborative Study of Indentification of High Risk Families, Mothers and Outcome of their Offsprings with Particular Reference to the Problem of Maternal Nutrition, Low Birth Weight, Perinatal and Infant Morbidity and Mortality in Rural and Urban Slum Communities. New Delhi, Indian Council of Medical Research, 1990.
6. The State of the World's Children–1991. New York, UNICEF.
7. Bhave S. Trends in perinatal and neonatal mortality and morbidity in India. Indian Pediatr 1989, 26: 1094-1099.
8. Report of Task Force on Minimum Perinatal Care, Ministry of Health and Family Welfare, Government of India, 1983.