

Chapter 1

CURRENT STATE OF THE HEALTH OF NEWBORN INFANTS IN DEVELOPING COUNTRIES

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Only in the past decade has the health of newborn infants in developing countries attracted attention from governments and international agencies. Usually the emphasis is primarily on Safer Motherhood Programmes but, in general, efforts to improve perinatal care will have positive benefits for the health of the newborn infant. Newborn infants, however, deserve their own special focus. Despite a marked downward trend of mortality rates of under-fives in developing countries (and especially South Asia) over the past 20 years, the newborn infant has not had an equal share in this “child survival revolution”. This is not a new phenomenon. From 1900 to 1935, perinatal (and maternal) mortality in England and Wales was unchanged and even higher than the average for the developing world today.¹

During the same period, post-neonatal and infant mortality rates fell substantially as a result of improvements in infant nutrition, control of infectious diseases, and better access to infant welfare. But perinatal mortality reduction awaited changes in maternity practices, a better understanding of the physiological needs of the newborn, and the introduction of appropriate newborn care.

Reasons for Neglect of the Newborn

In most developing countries today the health problems of newborn infants remain neglected and interventions to reduce early neonatal mortality are not a high priority for investment. The reasons for this neglect are complex and include cultural adaptation to high neonatal wastage, poor data collection about perinatal deaths, and a widespread misconception that neonatal care is expensive and depends on high technology equipment. It is also partly due to lack of leadership: obstetricians are often responsible for neonatal care but are usually interested solely in the care of mothers, whereas paediatricians have tended to give priority to older infants and children.

Cultural adaptation

Poor awareness among the people, high fertility rates, and fatalistic acceptance of high neonatal mortality have also contributed to the slow development of neonatal care. Societies have culturally adapted to high neonatal casualties by according newborns the status of fully-fledged individuals only after the critical first week of life when a naming ceremony is performed and the birth is “completed”. In some communities, there is an erroneous belief that low birth weight is beneficial and protects against an obstructed labour.

Under-reporting

There is also widespread under-reporting of stillbirths and early neonatal deaths which fails to appraise planners of the dimensions of the problem. WHO epidemiologists candidly admit that perhaps 40% or more of early

neonatal deaths and stillbirths may go unreported in official data collection. In a study of actual versus officially recorded perinatal mortality in a district in Thailand the measured a rate of 22 perinatal deaths per 1,000 compared with no perinatal deaths reported through official statistics.² Even in research studies,³ analysis of infant mortality may fail to give perinatal causes their due prominence and often being subsumed under the category of “other causes”.

A misconception that essential newborn care is expensive

A final crucial reason for neonatal neglect is the widely held misconception that perinatal care depends upon interventions which are too costly or technological for high coverage in poor communities. This attitude has been aggravated by the exposure of professionals to neonatal intensive care units. Yet over 50% of all infant deaths occur in the first month,^{4,5} two-thirds in the first few days, and many could be prevented just as easily as later childhood deaths due to diarrhoeal or respiratory diseases. Mothers, health professionals and policymakers all seem to lack education about the simple, low-cost principles of newborn care laid down by the French obstetrician Pierre Budin in his classic work “The Nursling”,⁶ as shown in Table 1.

Table 1 Principles of essential newborn care.

Air	Resuscitate and maintain an airway.
Warmth	Keep the newborn warm and avoid unnecessary hypothermia or cold stress.
Food	Encourage early breastfeeding, and feed high-risk newborns more frequently.
Hygiene	Maintain hygiene during delivery and cord-cutting; treat infections promptly.
Love	Ensure the newborn infant stays close to its mother, and mothers have open access to their newborn infant if he or she requires special care.

Size and distribution of global perinatal mortality

Table 2 shows the most recent estimates for perinatal, neonatal and maternal mortality rates for different regions of the world. The perinatal mortality rate is the number of stillbirths and deaths in the first seven days of life (of infants more than 28 weeks gestation or > 1,000 g birthweight) per 1,000 births. Stillbirths were slightly more common than first-week deaths in studies from India (50–56%),⁷ Nepal (57%),⁸ and Ghana (67%).⁹ The neonatal mortality rate is the number of deaths occurring in the first 28 days per 1,000 livebirths, and the maternal mortality rate is the number of maternal deaths occurring in the perinatal period per 100,000 livebirths. All figures from developing countries are based on census or survey estimates so their reliability is open to

Table 2 Perinatal, neonatal and maternal mortality rates worldwide.

	<i>World</i>	<i>More developed countries</i>	<i>Less developed countries</i>	<i>Asia</i>	<i>Africa</i>	<i>Latin America</i>
Perinatal deaths (thousands)	7,636	155	7,480	4,583	2,404	483
Perinatal mortality rate	53	11	57	53	75	19
Neonatal deaths (thousands)	5,080	96	4,984	3,386	1,291	301
Neonatal mortality rate	36	7	39	41	42	25
Maternal deaths (thousands)	585	4	582	323	235	23
Maternal mortality rate	430	27	480	390	870	190

Source: World Health Organization (1995)

question. South Asia is one of the most highly-populated regions of the world with nearly one quarter of the world's population. Although Africa has the highest overall perinatal, neonatal and maternal mortality rates, the greatest number of deaths occur in Asia, especially the South Asia region.

The leading causes of neonatal deaths are usually birth asphyxia, low birth weight (both premature and intrauterine growth-retarded infants), tetanus and other bacterial infections, and jaundice, but the allocation of cause to death during this period can be as difficult as the assignment of mortality by verbal post-mortem in older age groups. The most useful pathophysiological classification described by Wigglesworth¹⁰ has been used in audits of perinatal mortality and is discussed more fully in Chapter 22.

The Importance of Low Birth Weight

Over 70% of neonatal mortality occurs in the low birth weight group (< 2,500 g).⁷ The risk factors for intrauterine growth retardation have been well described. In developing countries a low pre-pregnancy maternal weight and height, low caloric intakes, and infections, especially malaria, outweigh the effects of developed country risk factors such as cigarette smoking and primiparity. Preterm infants are at greater risk than growth-retarded infants. In a large longitudinal study in Brazil¹¹ preterm babies had a perinatal mortality rate 13 times higher than that of babies of appropriate birth weight and gestational age, and two times higher than that of intrauterine growth-retarded babies. But what to do about low birth weight? In India, substantial achievements in reducing severe forms of protein energy malnutrition have not been matched by a decline in low birth weight incidence (see Chapter 4). The national incidence is 30% rising to levels above 50% in urban slum mothers. Supplementation programmes can produce small increases in birth weight but they are expensive to implement. In fact, some authors have questioned whether they confer any significant benefit.¹² There are antenatal interventions which can affect foetal growth but their impact in a developing country setting needs further evaluation (see Chapter 8).

Low birth weight is not only a major risk factor for neonatal death, but also has long-term consequences for health and development in childhood

and adult life. Recent epidemiological studies, reviewed in Chapter 17, have identified strong associations between low birth weight and a later risk of cardiovascular and other degenerative diseases such as diabetes. This emphasises the potential cost-effectiveness of perinatal interventions, which may have long-term as well as short-term health benefits.

Birth Asphyxia

Birth asphyxia leading to either stillbirth or hypoxic-ischaemic encephalopathy in the newborn is a major cause of neonatal death and neurodevelopmental sequelae. It is also an important area for future research. We need to know more about the epidemiology, causes and sequelae of asphyxia as well as the most cost-effective interventions for prevention. How can labour be managed better in order to reduce the number of asphyxiated babies? To what extent do postnatal insults like hypothermia and hypoglycaemia contribute to and exacerbate asphyxial mortality and morbidity? Does the higher incidence of perinatal asphyxia in developing countries lead to a higher incidence of minor neurodevelopmental sequelae in survivors, such as motor and learning deficits, or is asphyxia an “all-or-nothing” phenomenon — the asphyxiated infant either dies or makes a full recovery? Is it cost-effective to train community based midwives and birth attendants in neonatal resuscitation? Should they be given a simple bag and mask or be trained in mucous extraction? Or should training for birth attendants be confined to recognition of the mildly asphyxiated infant and postnatal support through avoidance of hypothermia and the establishment of early and frequent breastfeeding? Many of these questions are addressed in Chapters 11 and 12.

Hypothermia

Newborn infants are vulnerable to hypothermia and cold stress, especially those born with a low birth weight. Recent evidence indicates that hypothermia is a common and preventable cause of neonatal morbidity and mortality even in countries with a predominantly warm climate. In many maternity hospitals, preservation of the “warm chain”, to ensure a newborn

infant is dried, wrapped, breastfed early and nursed in an appropriate ambient temperature, is not maintained. Monitoring methods for thermal control are rudimentary or absent (see Chapters 9 and 10). Skin-to-skin contact and the Kangaroo Care Method are low-cost and effective methods to prevent hypothermia, but still not widely practised.

Infection

Clean surface, clean hands, clean cord-cutting — these are basic principles for the maintenance of hygiene in the perinatal period, but unfortunately they still not practised on a large scale. Newborn infants are especially vulnerable to infection and the signs and symptoms may be non-specific. Prompt recognition of possible infection in a newborn infant, and rapid treatment with appropriate anti-microbial drugs is a key part of essential newborn care. Perinatal transmission of infection from mother to infant is a major area for future preventive action. Syphilis, hepatitis B, and now HIV infection, are of major importance. In sub-Saharan Africa congenital syphilis remains common yet entirely preventable with appropriate antenatal screening. Hepatitis B vaccination has been available since 1982 and is now recommended as part of the Global Programme for Vaccination in many developing countries. So far, virtually no country in sub-Saharan Africa or South Asia has introduced mass vaccination as recommended, even though the cost of the vaccine has fallen substantially. HIV infection is at epidemic proportions in many African countries and is rapidly increasing in South Asia. Therapeutic measures to reduce perinatal transmission have been successful in the West but remain unaffordable elsewhere (see Chapter 13).

Early Breastfeeding

Every year brings new discoveries about benefits that can be derived from breastfeeding (see Chapter 14). Early breastfeeding, starting from the first hour after birth, guarantees that infants receive the anti-infective and immunising effects of colostrum, protection against hypothermia and hypoglycaemia, and a secure bond with their mothers. It is an astonishing

fact that over half of all newborn infants in South Asia are not put to the breast at all in the first 24 hours and colostrum is widely discarded. Many innovative strategies to promote breastfeeding have been tried, more recently as part of the Baby Friendly hospital initiative. This has enjoyed considerable success but faces competition from the inappropriate promotion of breastmilk substitutes by formula milk companies, in contravention of the WHO Code on the marketing of breastmilk substitutes ratified by most governments in the 1980s. Many health workers are poorly informed about breastfeeding and lack the skills necessary to tackle problems with lactation.

Perinatal Care: A World Bank Priority for Investment

In the 1993 World Development Report “Investing in Health”, published by the World Bank, investment in perinatal care was identified as one of their highest priorities. It was seen as potentially the most important strategy, along with the targeting of acute respiratory infections in infancy, for reducing mortality of under-fives (see Appendix B6 in the report). As the World Bank is the largest health sector donor it is hoped that governments use this investment capital in ways that will strengthen perinatal and neonatal care.

Getting Research into Policy and Practice

How can apparently simple interventions be implemented more effectively to reduce the 7.6 million perinatal deaths each year? Inadequately trained health workers, particularly maldistribution of trained personnel, inadequate resources for medical equipment and supplies, and difficult geographical terrain are major problems in providing good health care for all the people.

Levels of Perinatal Care and Referral Systems

The two main determinants of successful perinatal health care seem to be first, a motivated community based worker with basic training in the management of safe delivery and newborn care, and second, a tiered system

of referral.¹³ Traditional birth attendant training has many advantages in societies where most births take place at home, but there have been few rigorous evaluations of such training programmes (see Chapters 23 and 24). The coverage of many TBAs may be less than 30 deliveries per year so the need for follow-up refresher training of large numbers of women in remote areas imposes severe logistic difficulties for health planners. A successful referral system must also be physically and economically accessible so that mothers identified as high risk can be transferred to a higher level facility. In remote areas far from district hospitals it may be useful to develop maternity staging posts¹⁴ with trained staff available at all times. But in many countries rapid urbanisation is leading to a sharply increasing demand for institutional delivery so attention is focussing again on the quality of hospital maternity care. Even where referrals take place the conditions of care for infants during transport are grossly inadequate, and audit studies suggest many infants might have had a better outcome without referral (see Chapter 25).

Special care for high risk infants in hospital need not be expensive (see Chapters 20 and 21). Most life threatening conditions can be treated at low cost for more mature infants. Infants less than 32 weeks gestation may need more expensive care, and in many settings it will be considered inappropriate and not cost-effective to attempt intensive care such as ventilation.

User-friendly Services

The supply of accessible primary care perinatal services is not the only limitation. In India, a lack of demand appears to be a major problem with up to 90% of mothers choosing not to use existing and accessible services.¹⁵ Much of this lack of demand may be accounted for by the services not being “user-friendly”. The involvement of mothers in the design and monitoring of these services might improve the situation. Midwives, obstetricians and paediatricians need also to practice evidence-based treatment. There has been extensive analysis of the value of different perinatal interventions, yet too often mothers are subjected to procedures and routines for which there is no proven benefit (see Chapter 26).

More worrying in some countries is the impact of user charges (now widely encouraged by international agencies) on the utilisation of antenatal and perinatal services. In Nigeria, a study of attendance patterns at a district general hospital revealed a sharp and sustained decline in antenatal attendances and hospital deliveries since user charges were introduced in 1984, together with a rising trend in hospital perinatal mortality and morbidity such as neonatal hypothermia and tetanus.¹⁶ In Zimbabwe, maternal mortality rates rose after the introduction of charges for perinatal care. In South Asia, there are often many hidden costs involved in supposedly free maternity services which act as an economic deterrent to users.¹⁷

Dissemination of Information and Continuing Medical Education

Since 1990 the Baby Friendly Hospital initiative of UNICEF has been an important advance not only to stop the dangerous distribution of free infant formula supplements in maternity hospitals but also to promote good perinatal care to hospital staff in the developing world. More can be done using the principles of medical audit to improve care: agreement on guidelines of good practice, monitoring of actual practice, and implementation of training and management initiatives to bring about changes in care (see Chapter 22).

Modern communication methods make information more accessible and more easily disseminated to remote areas. These methods need to be harnessed so that the population as a whole, rather than an urban elite, can benefit.

Conclusion

Much ill-health in developing countries is often attributed to socio-economic factors beyond the control of health professionals, but for perinatal health there is a real opportunity in the next decade to make progress, led by doctors, midwives and nurses. It is hoped that this book will stimulate readers to improve perinatal care, wherever they are working, by getting research findings into policy and practice.

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