Survival of Newborns: Implications for Achieving the Millennium Development Goal in Bangladesh

Subir Saha, Research, Monitoring and Evaluation Specialist, Freelance Consultant, New York, USA

M. Kabir, Professor, Department of Statistics, Jahangirnagar University, Bangladesh

Subir Saha, Research, Monitoring and Evaluation Specialist, 99-42, 41 Avenue, Apt. # 4B, Corona, New York, NY 11368, USA, Email: subir_03@yahoo.com

Abstract

The global burden of neonatal deaths is around 37% of all under-five deaths (UNICEF 2008). In Bangladesh, neonatal deaths account for almost half of all under-five mortality. Most newborn deaths in Bangladesh take place at home and in the absence of a skilled hand. The target of Millennium Development Goal 4 for Bangladesh is to reduce under-five mortality by two thirds by 2015 from 1990 levels. The objectives of this article are to give an overview of newborn health in Bangladesh and provide a strategy for further reducing under-five mortality to achieve MDG 4.

Data for this study were obtained from the Bangladesh Demographic and Health Survey (BDHS) 2004 data set (National Institute of Population and Training [NIPORT] et al. 2005). According to the BDHS, under-five mortality in Bangladesh declined from 133 per 1000 live births in 1991 to 88 per 1000 in 2001, about 4.1% per year. However, the decline was faster between 1991 and 1997 than from 1997 to 2001. The BDHS shows that while neonatal deaths were 39% of all under-five deaths in 1991, they constituted almost half in 2001. The highest concentration of newborn deaths occurred during delivery and within the first 24 hours of birth. Reducing newborn deaths will be an important strategy to achieve MDG 4.

Introduction

The objectives of this paper are to provide an overview of newborn health in Bangladesh and to describe a strategy to further reduce under-five mortality in order to achieve Millennium Development Goal (MDG) 4. We use data from the Bangladesh Demographic and Health Survey

(BDHS) 2004 (NIPORT et al. 2005), which is a nationally representative sample survey.

The child mortality rate is a reflection of the care, health and nutritional status of children below the age of five years and also indicates the social, cultural and economic progress in the country. A comparison of 2004 data with earlier BDHS results shows a substantial (20%) improvement in child (1–4 years of age) survival, but there is no evidence of change in infant (<1 year) survival in recent (up to 2004) years. Despite improvement in child survival, neonatal mortality remained high in Bangladesh. The decline in child mortality can be attributed to improvement in the management of diarrhea and acute respiratory infection – especially pneumonia – and improved immunization coverage and vitamin A supplementation.

Every year, approximately 4 million babies are born in Bangladesh and approximately 120,000 die in the first 28 days of life. Neonatal death accounts for about two thirds of infant deaths. The high number of newborn deaths is a major concern, both for the reduction of under-five mortality and to achieve MDG 4.

Materials and Methods

Data Sources

This paper utilized the birth history data of the 2004 BDHS, the fourth survey of its type conducted in Bangladesh. BDHS followed a two-stage cluster sampling design with samples from rural and urban areas. The data were also representative for each of the six divisions: Barisal, Chittagong, Dhaka, Khulna, Rajshahi and Sylhet. Details of the survey have been reported elsewhere (NIPORT et al. 2005). The 2004 BDHS is a nationally representative survey of 11,440 ever-married women aged 10 to 49 and includes detailed information of the birth and death of each child. For each live birth, the date of birth, sex and survivorship status was collected. For living children, the age of each child at his or her last birthday was recorded. For children who had died, the respondent was asked to provide the age at death. The number of children in the 10-year reference period preceding the survey for whom survival status and basic information were known is 14,209, 9886 and 4323 for national, rural and urban areas, respectively.

The BDHS focused mostly on quantity. So to understand the particular problems, issues, norms, associated factors and community perceptions related to newborn death, in addition to BDHS data, qualitative data were collected through focus group discussions (FGDs) with mothers, family members and traditional birth attendants (TBAs). The FGDs took place in rural and peri-urban settings of Parbatipur Upazila under Dinajpur district. An FGD was conducted separately with each group, following the guidelines of participatory rapid assessment (PRA). Each FGD was conducted with 10 to 12 participants so that everyone could participate actively and get equal attention.

To understand the poor–rich inequality in mortality, households were classified into five quintiles (ranging from poorest to richest), each representing 20% of the total population based on ownership of selected household assets, source of drinking water, type of latrine used and the construction materials of different parts of the dwelling (Filmer and Pritchett 1998; Gwatkin et al. 2000). A separate index was constructed for urban and rural households, following the principal component analysis method. The first and fifth quintiles were considered as the poorest and richest, respectively, and used for comparison and measuring poor–rich inequality by using quintile ratios, concentration curves and indices. Mortality rate was calculated using the life table technique and BDHS birth history data.

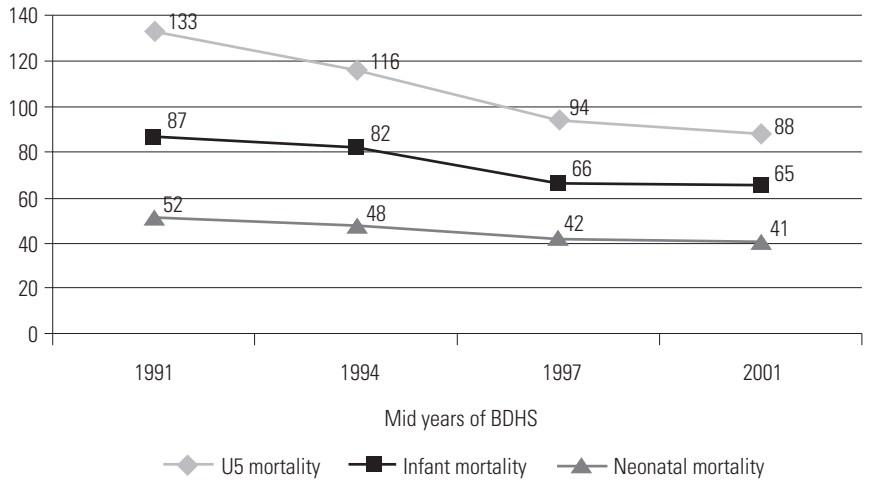
Results

Trends in Childhood Mortality

According to 2004 BDHS data the neonatal mortality rate (NMR) in Bangladesh is relatively high (41 per 1000 live births) compared with that of other developing countries. NMR has shown an extremely slow decline over the years. Between 1989 and 1993 it was 52 per 1000 live births; from 1992 to 1996, 48 per 1000, and from 1995 to 1999, 42 per 1000. Neonatal mortality fell by about 21% over the 10-year period. In the same period, under-five mortality declined by 34% and

infant mortality by 25%. Figure 1 shows the trends of neonatal, infant and under-five mortality in Bangladesh since 1991.

Figure 1. Trends in childhood mortality in Bangladesh



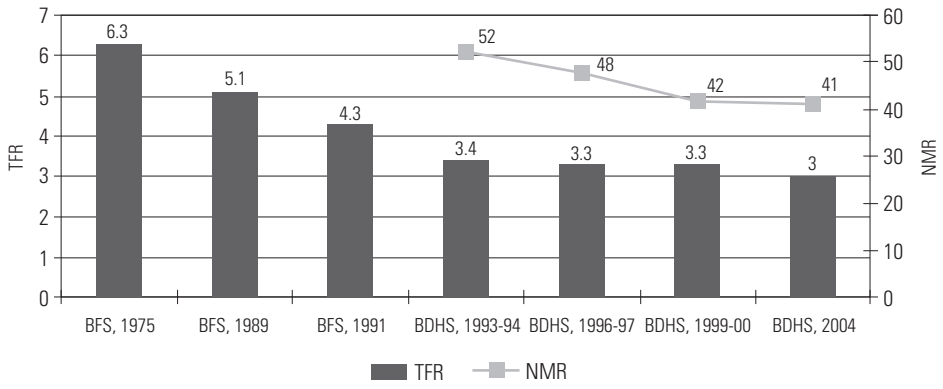
BDHS = Bangladesh Demographic and Health Survey.

While neonatal deaths were 39% of all under-five deaths in 1991, they constituted almost half of all under-five deaths in 2001. Neonatal mortality constitutes the majority of infant deaths: 60% in 2004.

Total Fertility Rate and Newborns Survival

The empirical data from Bangladesh give no clear indication of neonatal mortality decreasing along with fertility decline. According to the BDHS, the total fertility rate in Bangladesh declined from 6.3 in 1975 to 3 in 2004. This is largely due to the impressive increase in the contraceptive prevalence rate, from 8% in 1975 to 58% in 2004 (NIPORT et al. 2005). Despite this significant fertility decline, neonatal mortality remained nearly stagnant and relatively high (Figure 2).

Figure 2. Trends in total fertility rates (TFR) and neonatal mortality rates (NMR)

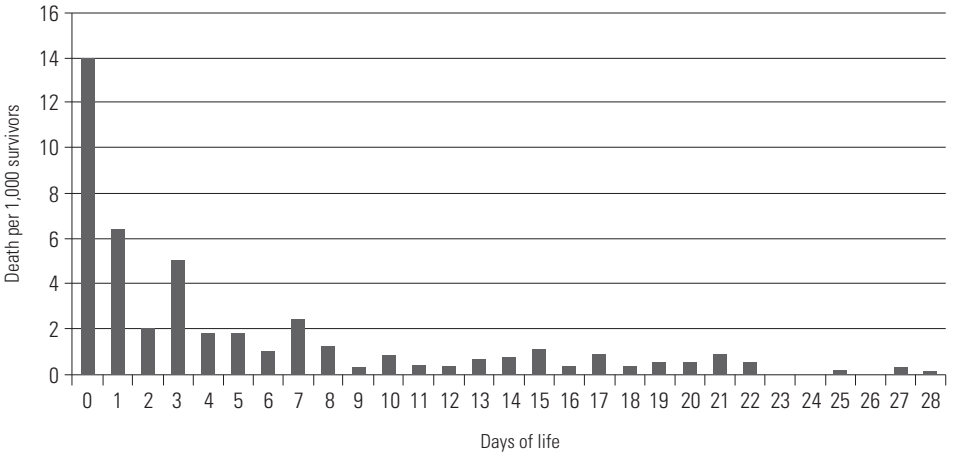


Note. NMR was not available for BFS 1975–1991.
BFS = Bangladesh Fertility Survey; BDHS = Bangladesh Demographic and Health Survey.

Neonatal Mortality by Days

While the neonatal period is only 28 days, almost half of all under-five deaths take place during that time in Bangladesh. About a quarter of deaths occur during the post-neonatal period, and another quarter between ages 1 and 4 years. Within the neonatal period there are considerable variations in the daily risk of death (Figure 3).

Figure 3. Daily risk of death in neonatal period in Bangladesh



As in other developing countries, mortality of newborns in Bangladesh is also very high in the first 24 hours after birth. More than 30% of neonatal deaths included in this analysis occurred within 24 hours of birth. Around 75% of neonatal deaths occurred in the first week after birth. These findings support the global statistics on newborn deaths. Globally, 25% to 45% of all newborn deaths occur in the first 24 hours after birth, and some three quarters of newborn deaths occurs in the first week (Lawn et al. 2005).

Trends in Early Neonatal Death

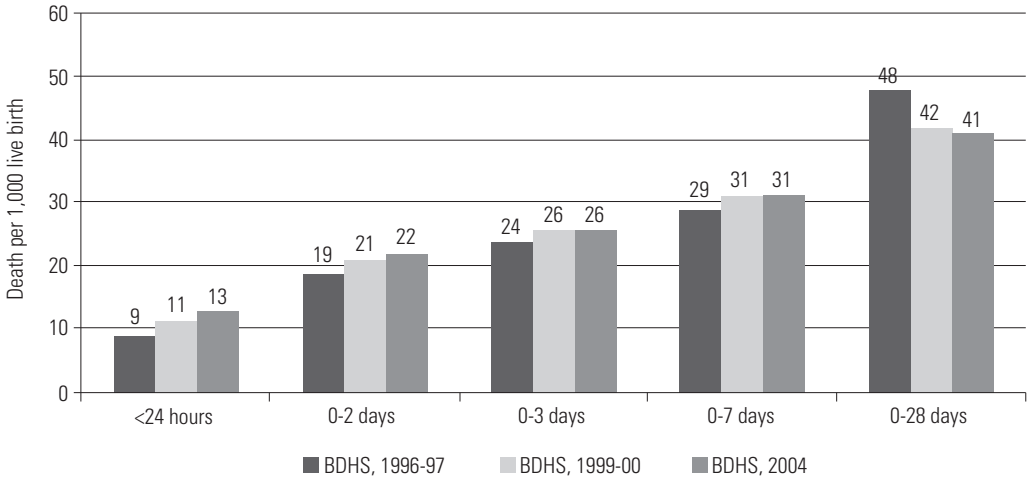
In comparing the three recent BDHS data sets (BDHS 1996–1997, 1999–2000 and 2004), it is evident that the neonatal mortality (death between 0 and 28 days) rate has shown an extremely slow decline over the years; however, deaths in the early neonatal period (between 0 and 7 days) are gradually increasing (Figure 4).

Globally, death during the neonatal period accounts for almost two thirds of all deaths in the first year of life. About two thirds of neonates die in the first week of life and, of those, two thirds die in the first 24 hours (Lawn et al. 2005). Investigation of the two-thirds rule in the Bangladesh context demonstrates that roughly two thirds of deaths occurred in the first month of life. Among the neonatal deaths, about three quarters occur within first week. Similarly, of deaths within one week, about one third occur within first the 24 hours. There may be some errors in recording the time of death for newborns between the first 24 hours and the second day, and so on. As a result, the ratio of within-24-hours deaths to within-first-week deaths is low.

Causes of Neonatal Death

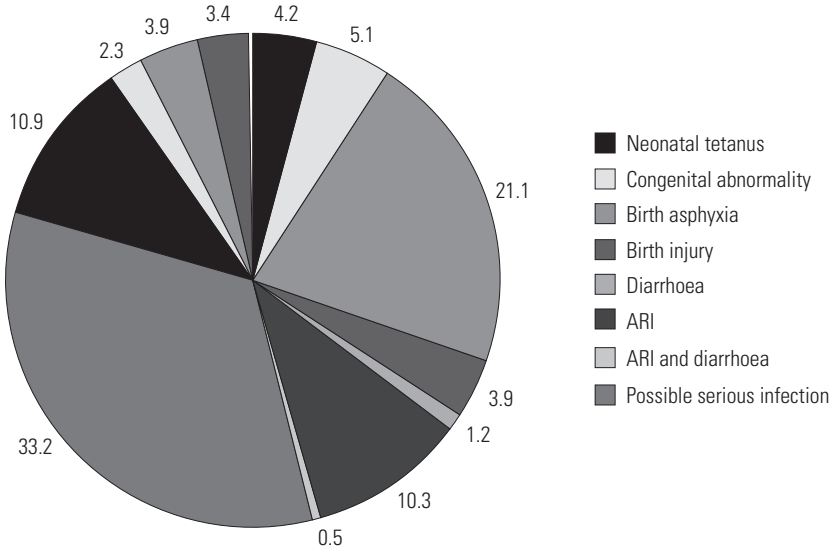
According to the 2004 BDHS, possible serious infection is the most important cause of death among neonates (33%), followed by birth asphyxia (21%), pre-maturity/low birth weight (11%) and acute respiratory infection (10%). Figure 5 shows the causes of neonatal deaths as reported in BDHS 2004.

Figure 4. Trends in neonatal mortality in Bangladesh, BDHS 1996–2004



BDHS = Bangladesh Demographic and Health Survey.

Figure 5. Causes of neonatal death, BDHS

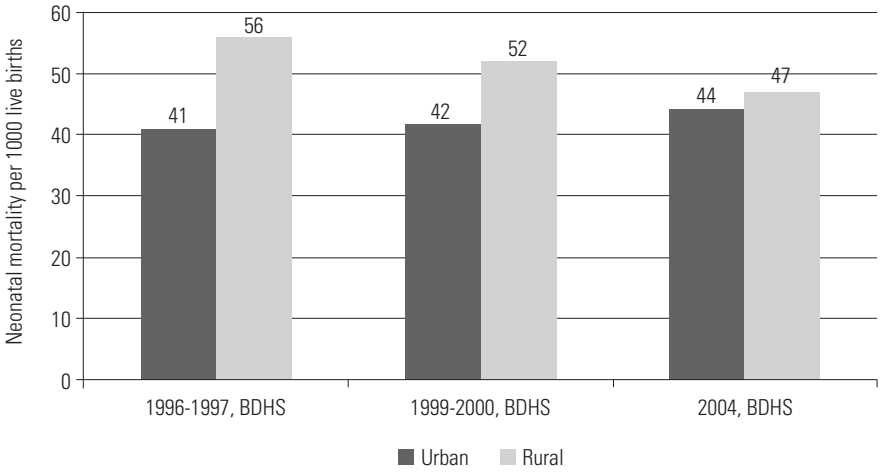


ARI = acute respiratory infection; BDHS = Bangladesh Demographic and Health Survey.

Trends in the Urban–Rural Neonatal Mortality Rate

Place of residence – usually in the rural–urban dichotomy – has generally been regarded as an important area where meaningful differentials in neonatal mortality can be observed (World Health Organization 1991). Although NMR is consistently lower in urban areas (47 vs. 44 per 1000 live births for rural and urban, respectively), the urban–rural difference in neonatal mortality in Bangladesh has narrowed in recent years. In urban areas neonatal mortality has been increasing, while in rural areas it has been decreasing (Figure 6).

Figure 6. Trend of urban–rural neonatal mortality rate

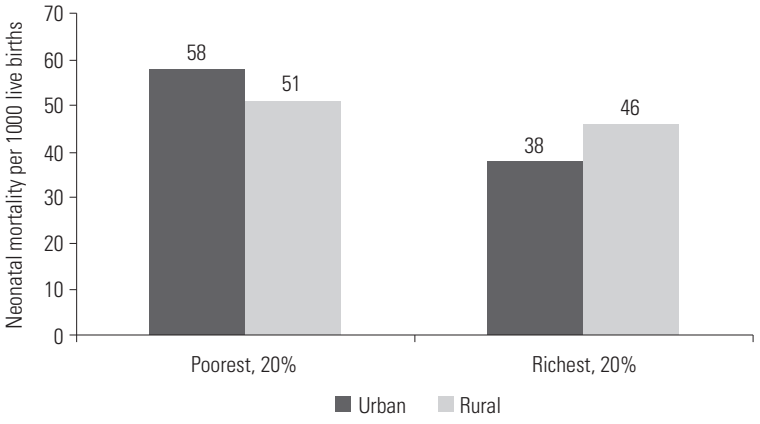


BDHS = Bangladesh Demographic and Health Survey.

Poor–Rich Gap in Neonatal Mortality Rate

The NMR is consistently high for those living in a poor family (first quintile). For example, a poor–rich ratio of 1.6 for urban children implies that NMR in the poorest quintile is about 1.6 times higher than in the richest quintile. In rural areas, the poorest-to-richest ratio of NMR is 1.1, indicating that in rural areas the NMR is also higher among the poorest quintile. This also indicates that there is much difference in NMR between the rural and urban poor. Among the urban poor, the NMR is 58 per 1000 live births, whereas for rural poor the rate is 51 per 1000 (Figure 7). At the national level, the NMR is 41 per 1000 live births. This information suggests that child survival for urban poor children would be worse in future. Rapid urbanization and urban poverty is likely to increase, particularly in the urban slums where the quality of life is extremely poor.

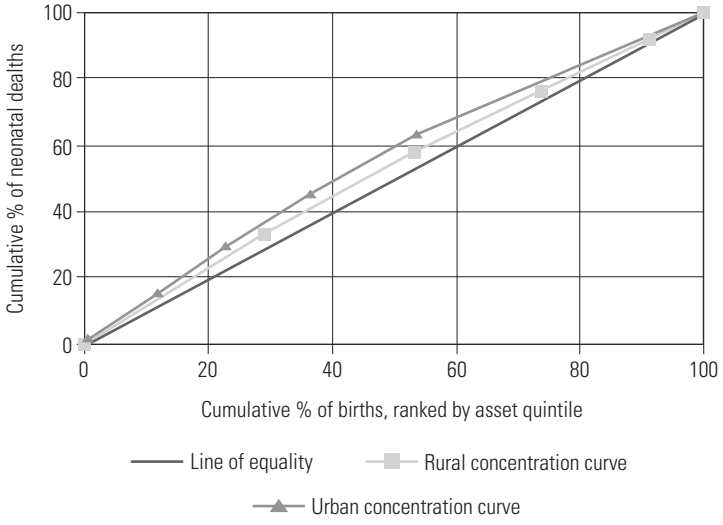
Figure 7. Urban–rural gap in neonatal mortality



The negative value of the concentration index, -0.0361 and -0.0765 for rural and urban areas, respectively, showed that both rural and urban neonatal mortality is concentrated within poorest families. However, Figure 8 illustrates that although in both urban and rural areas NMR is higher

in poor families, poor–rich inequality is higher in urban than in rural areas.

Figure 8. Rural and urban concentration curve for neonatal mortality rate



This paper also identified a sharp difference in newborn mortality between rural-to-urban migrants and non-migrants in Bangladesh. Neonatal mortality is 1.5 times higher among urban migrants than among urban natives (48 and 32 per 1000 live births, respectively). Rapid growth of the urban population in recent years, due to migration, is considered one of the major explanations for such urban–rural differentials in childhood mortality in Bangladesh. Due to unmet basic needs and environmental hazards, the health risk for urban children of poor families is much higher than those for rural children, but in Bangladesh, the government's primary healthcare system is focused mainly on rural areas. The disadvantaged condition of urban migrants is also evident in the relatively poor rate of healthcare utilization among mothers of migrant children compared with that of urban natives. For example, among migrants 40% of mothers received at least three antenatal care visits, compared with 61% of urban natives. Similarly, institutional delivery is almost two times higher for urban natives than for migrants (34% and 18%, respectively).

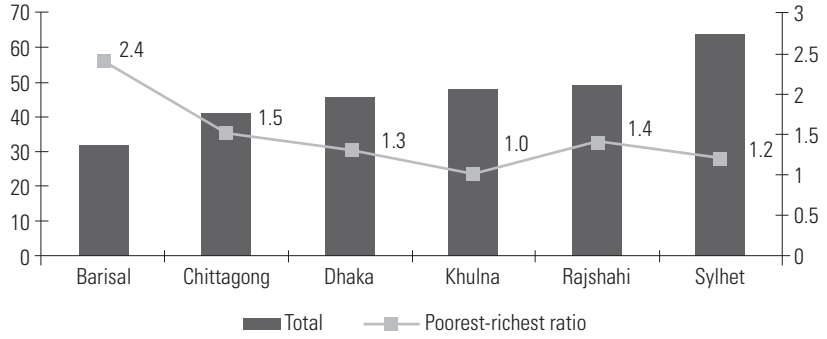
The data also indicated wide variations in neonatal mortality across geographic divisions. Among the six divisions, Sylhet had the highest NMR (64 per 1000 live births), and the division's lifetime risk of neonatal mortality was also high. In Barisal division, there is a huge difference in NMR between the poorest and richest quintiles: the NMR in the poorest quintile is more than two times that in the richest (Figure 9).

Discussion

Qualitative findings suggest that limited access to information, insufficient skilled care providers, the perceived value of women, women's illiteracy, cultural beliefs, gender discrimination, absence of emergency preparedness at the family level and absence of ready transport and cash create obstacles for community-based newborn and maternal healthcare. Although the government has established health infrastructures and intensified health services all over the countryside to improve the health of the people, women often do not receive appropriate institution-based care in emergencies. Women who do receive facility-based care often confront service providers who are not gender sensitive and who may not ensure privacy or confidentiality, which further discourages women from using these services. Despite efforts to increase access to institutional care and promote institutional delivery,

home delivery is still common in Bangladesh. About 89% of mothers in Bangladesh deliver their babies at home, and TBAs conduct the large majority (87%) of home deliveries. Poverty and the inability to pay for services also confound the problem. Analysis of the data indicates that the "invisibility" of maternal, fetal and neonatal deaths is largely due to socio-cultural practices.

Figure 9. NMR and inequality by division



To address urban–rural inequality, as well as to improve the survival status of newborns in the country as a whole, there is a crucial need to strengthen the urban primary healthcare system, which is almost ignored, especially at the sub-district level of municipalities in Bangladesh. Responsibility for primary healthcare services for urban dwellers belongs to the Ministry of Local Government Rural Development and Cooperative. But this ministry has limited technical expertise, resources and skills. Primary healthcare services in rural areas are provided by the Ministry of Health and Family Welfare (MOHFW). The MOHFW is responsible for the country's overall health policy formulation, planning and decision making. Recently, local government, with financial support from the Asian Development Bank, Department for International Development, Swedish International Development Co-operation Agency, United Nations Population Fund and Orbis Bangladesh, is offering primary healthcare services targeted to the poor. But these services are limited to six city corporations (i.e., six major cities of six divisions) and only five district-level municipalities, whereas there are 300 municipalities in Bangladesh. The project is a public–private partnership. If replicated in other districts, the project can benefit many more of the poor.

One of our most important findings is that about 30% of all neonatal deaths happen on a child's first day. Almost 75% of newborns die in their first week. But 0 to 3 days is the peak period of newborn deaths, as almost 63% of neonatal deaths occur during this period. Hence it is a very critical period for newborns.

Complications of childbirth can have a significant impact on newborns. Over 30% of neonatal deaths are the result of injuries or infections sustained during delivery. Asphyxia, for example, occurs when the newborn receives an inadequate supply of oxygen immediately before, during or just after delivery. But research suggests that most birth asphyxia cases can be managed at the community level without sophisticated equipment. Babies need to be kept warm by being dried and wrapped. The airway must be cleared by correctly positioning the baby's head, by clearing mucus and, if necessary, by giving artificial respiration by mouth to mask or by tube and mask. Breastfeeding must also be supported (State of the World's Newborns 2001). But the reality is that mothers' as well as family members' knowledge on this issue is very poor. The Bangladesh government is promoting the skilled birth attendant (SBA) instead of the TBA, but, practically, SBAs are not readily available and it will take longer to expand their services to the whole country.

To improve its survival, a newborn baby should be dried, kept clean and warm and put to the mother's breast immediately after birth. But the reality is that in rural and even peri-urban areas, after

birth the newborn is left on the floor soaked in amniotic fluid until the expulsion of the placenta. Lack of awareness of hypothermia contributes to this harmful practice. Most babies are cleaned immediately by bathing and wiping off the vernix to make them holy and acceptable to be touched by others. Immediate breastfeeding is also delayed until expulsion of the placenta, as well as bathing rituals. The rate of early initiation of breastfeeding (within the first hour of delivery) is only 24% in Bangladesh, but findings suggest that immediate breastfeeding, within one hour of birth, can avert 31% of newborn deaths, or about 37,000 deaths per year.

Conclusion and Recommendations

It is evident that existing child survival strategies have concentrated mainly on children older than 1 month through focusing on pneumonia, diarrhea, malnutrition and vaccine-preventable diseases. Safe motherhood programs have focused primarily on mothers, through promotion of antenatal and postnatal care and safe delivery. Prevention of newborn death has not been addressed as expected because the two interventions are being implemented independently. The health of newborns must be considered with that of their mothers, who also face significant risks during and in the days following delivery. Causes related to pregnancy, delivery and infections each account for about one third of newborn deaths, so interventions need to address both mothers and newborns. Preventing newborn deaths as well as improving newborn health and survival go hand in hand with promoting safe motherhood. Decision makers can work to ensure healthier futures for mothers and their newborns by supporting programs that provide essential maternal and newborn care, as well as broader policies that enhance women's health and socio-economic opportunities during the life cycle.

Results of this study show important areas for program planners and policy makers to improve newborn survival in Bangladesh. First is the need to integrate newborn health interventions into existing safe motherhood and child-survival programs to bring many of the desired changes. Secondly, the urban primary healthcare system should be strengthened and integrated with the Ministry of Health and Family Welfare. We also recommend establishment of a well-functioning referral system and quality obstetric services to treat women in the event of complications, ensuring there is an appropriate number of qualified staff and making them available in healthcare facilities. It is also essential to ensure access to and quality of maternal and child healthcare services in public healthcare facilities for the poorest people. If these recommendations can be implemented effectively, the newborn's chances of survival will increase, and the consequent reduction in infant mortality will help us to achieve MDG 4.

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