Editorial

A Global View of Advancing Neonatal Health and Survival

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Ever since the Alma-Ata declaration “Health for All By the Year 2000 and Beyond” in 1978,¹ the World Health Organization (WHO) has been in the pursuit of improving the health of women and children. This is not surprising when one considers that women and children constitute 75% of the population in the developing countries. They are also the most vulnerable population.

Several programs have been initiated by the major non-governmental agencies WHO/UNICEF and World Bank to improve the health indicators of maternal and infant mortality. In 1987, the international conference on Safe Motherhood drew attention to high maternal mortality rates (MMRs) in the developing countries and encouraged policy makers to develop new strategies to reduce maternal mortality.² This led to the worldwide program of Safe Motherhood placing emphasis on antenatal care. In 1988, the Task Force for Child Survival set targets for reduction in MMR and infant mortality rate (IMR).³ It was recommended that a reduction in under 5 child mortality in all countries by at least half (1980–2000) or to 50/100 to 70/100 live births be achieved, which ever can be achieved earlier. Another target was to reduce “maternal mortality rates in all countries by at least half.”

Although some perceptible reductions have been recorded in under 5 and IMRs, during the last 25 years, the goals of reducing maternal and neonatal mortality rates in the developing countries remain elusive. On the other hand, great strides have been made in the developed countries. In the US, improved perinatal care has been hailed as one of the 10 medical achievements of the 20th century (CDC).^{4,5}

During this period in the US, IMR dropped by 90%. In early 1900s, approximately 100 infants per 1000 live births died before reaching 1 year of life. By 1999, IMR dropped to 7/1000 live births. Similar trends have been noted in other developed countries.⁶ Maternal mortality also dropped by 99% during the 20th century. In the beginning of the 1900s, a woman died per 1000 deliveries due to pregnancy-related complications. By the end of the century, MMR dropped to less than 1/10,000 deliveries.^{4,5}

Unfortunately, the same cannot be said for the developing countries. Global burden of maternal deaths is very high. Globally, 600,000 women die every year of pregnancy and labor-related causes. That is one woman dying every minute from pregnancy-related causes.

The global statistics for IMR are unacceptably high.⁷ Of the approximately 125 million infants born every year, 8 million die before reaching 1 year of life. Regrettably, most of the global burden of IMR is in the least developed and developing countries. Ninety percent of global births occurs in the developing countries (Africa, Asia, Mexico and South America). The IMR in these countries in 1960 was 171/1000 live births, which dropped to 109/1000 live births in 1996 — only a 40% reduction as opposed to 90% reduction in the developed countries.

Two-thirds of the IMR in the developing countries is contributed by neonatal deaths. About 4 million newborns die every year globally during the neonatal period. This is equivalent to all the infants born in the US in 1 year! Every 8 s, there is a death of a newborn somewhere in the world — a sobering statistic indeed.

The major causes of neonatal death include asphyxia, sepsis, pneumonia and prematurity. The major causes of maternal deaths include postpartum hemorrhage, sepsis and prolonged labor. Most of the neonatal and maternal deaths are preventable. WHO estimates that 40% to 60% of neonatal deaths are preventable. It is possible to save 1 to 2 million babies through basic interventions. Similarly, 50% of the maternal deaths over 250,000 lives can be prevented using basic principles of safe motherhood and mother–baby package promulgated by WHO as early 1987.

However, Turman⁸ noted that the early WHO initiative of Safe Motherhood failed to make a major impact on maternal and neonatal mortality as it focused only on antenatal care and it lacked continuum of care of the mother and the newborn, extending to intrapartum and postpartum period. This led to the concept of providing mother–baby package care,⁹ in conjunction with Safe Motherhood practices, in an attempt to close the gap between maternal and newborn care programs.

Marsh et al.,¹⁰ in this issue of the journal, provide further improvement upon the previously recommended models of mother–baby package care and Safe Motherhood program with specific recommendations to be adopted at each step from pregnancy to delivery and immediate newborn period. This model places emphasis on early interventions and the concept of mother–baby dyad as the targets of care.

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In the previous issue, Moss et al.¹¹ gave an overview of the global burden of neonatal/perinatal disease, then identified research priorities for the reduction of perinatal and neonatal morbidity in the developing countries. In the current issue, the article by Marsh et al.¹⁰ provides a conceptual framework to advance neonatal health and survival in the developing countries. Both articles are timely and are of special importance in the light of the forthcoming combined meeting of the Perinatal Section and the Section on International Child Health of the American Academy of Pediatrics in October 2002.

There is one missing step in the proposed paradigm — the lack of emphasis on pre-pregnancy care of the woman. Authors and planners would be wise to lay foundations for good health even before pregnancy through pre-pregnancy evaluation and counseling of women in childbearing age.

There are several factors that lead to poor pregnancy outcome in developing countries. These need to be studied extensively. Poor socio-economic status of the woman, low literacy and poor nutrition are all contributory to poor health, which are compounded by poor access to health care. These factors increase the pregnancy-related risks leading to high maternal mortality and neonatal death rates.¹² Thus, we should emphasize the need for overall improvements in women's education and health as the foundation to better pregnancy outcome. There is a need as well as an opportunity to encourage research studies in this period using different models of interventions, to improve women's health.

The authors^{10,11} identify a number of research priorities in the antenatal period. Maternal education, status and maternal nutrition are important areas to be considered for research. There is a large amount of existing data from different countries regarding the role of maternal nutrition on outcomes of the mother and the baby.

Newer studies should consider strategies that include the importance of micronutrients and vitamins that not only prevent low birth weight but also reduce other congenital anomalies. For example, in China, the prevention of neural tube defects with increase in prenatal folic acid intake was demonstrated.¹³ These observations can be extended to other parts of the world.

Unfortunately, one program does not fit all. Preventive strategies should be region-specific based on social and cultural backgrounds. For example, communicable diseases, maternal and perinatal condition and malnutrition account for 68% of burden of disease among girls and women in India. The same causes account for about 27% of female disease burden in China,¹⁴ where maternal malnutrition is not a major problem. Strategies, therefore, should be based on regional needs.

Birth asphyxia is a major contributor (25%) to neonatal mortality. Those who survive severe birth asphyxia are prone to develop neurodevelopmental problems and cerebral palsy. Birth asphyxia is preventable and manageable at the time of delivery. The Neonatal Resuscitation Program (NRP), first developed jointly by AAP/AHA,¹⁵ has been introduced to many countries worldwide. In India, NRP has been promulgated by the National Neonatal Forum (NNF), a professional organization, down to the district and village

level. Deorari et al.¹⁶ and Kumar¹⁷ have shown the feasibility of training traditional birth attendants (TBAs) in neonatal resuscitation. NALS on Wheels, an innovative project, helped to train rural physicians and birth attendants in the districts of the Orissa, the state with the highest IMR in India.¹⁸ There is a great scope for research in this field.

The authors^{10,11} correctly identify the area of sepsis as a research priority. This is of great clinical importance since sepsis is the major cause of death after birth asphyxia. Appropriate cord care and skin care will greatly reduce sepsis-related deaths. Simple interventions, like using cord care kit (piece of soap, clean blade, a tie and clean gauze) at a cost of less than 50 cents, could prevent cord infection. Other similar interventions need to be studied.

In terms of maternal infections, newer strategies should put emphasis on early detection of maternal infections. Chorioamnionitis is associated with preterm labor in the mother and periventricular leukomalacia in the newborn.¹⁹ There is a need for both epidemiologic and prevention studies in this area.

The authors^{10,11} also suggest research into studies of community-based use of antibiotics. Extreme caution is warranted to avoid indiscriminate community use of antibiotics in the developing countries because of the danger of emergence of antimicrobial-resistant organisms.²⁰

As the authors indicate, there is a great need for studies in the area of HIV infection in women and children. Perinatal prevention of HIV has been found to be very effective in the US.²¹ These experiences should be expanded to other countries.

In terms of intrapartum interventions, the authors identify strategies to improve skills of the TBAs, midwives and physicians at the community level. In India according to the National Family Health Study,²² only 25% deliveries took place at institutions; the rest occurred at home. Of these, 88% was attended by untrained personnel, 47% by TBAs and 41% by friends or relatives, thus the importance of capacity building of health care providers. Strategies should be initiated to train the TBAs and appropriate members of the community in providing basic care at delivery and immediate newborn care. Majority of TBAs are not literate but highly adaptable to training. TBAs have been successfully trained in neonatal resuscitation.¹⁶ Some investigators have trained illiterate TBAs to use pictorial records to assess maternal and neonatal health status.²³ Such approaches have been highly effective in recognizing mothers and infants at risk. Prevention of hypothermia using the kangaroo mother care has been highly successful.²⁴ Breastfeeding is given the highest priority in childcare in the developing countries.

It might be difficult to envision for the typical western-trained Neonatologist that "lay" nonliterate TBAs or village women can be trained to care for the newborn. There is ample evidence that this is not only feasible but it is highly effective. Bang et al.^{25,26} have shown through carefully conducted studies in remote rural areas of India that community health workers, mothers and TBAs can be trained to identify early signs of respiratory distress, sepsis and equally well manage them effectively. Using a defined protocol, they demonstrated

that there was a 50% reduction in mortality in infants with respiratory distress and, in another group, a 50% reduction in sepsis-related death managed by health workers.

There is a great need to understand existing cultural practices and dissuade detrimental practices but improve upon existing useful practices. Clearly, there is ample scope for research in rural neonatology.

In order to successfully implement any of the aforementioned strategies, absolute commitment of the concerned governments and policy makers is needed. Reduction of neonatal mortality should be considered a public health priority by the health policy makers. Indeed, Thapa, the Director of WHO/SEAR, calls newborn care a public health imperative.²⁷ Some governments have taken major initiatives in this regard.

It is heartening to note that through the efforts of the NNF of India, the government of India has taken steps to increase public awareness of the importance of improved newborn care by declaring November 15–21 every year the Newborn Week since year 2000. During this period, information regarding woman's health, importance of nutrition, vaccination, antenatal care and care of the newborn is disseminated throughout the country through print, radio, television and public meetings. Public officials, social workers, politicians and lay public all participate in the week-long awareness activities. It is hoped that pediatricians and health professionals in other countries are equally successful in bringing about similar public awareness programs in their country.

In Central Asia, the President of Uzbekistan also declared improved newborn care as a health priority of his country. These are indeed welcome signs.

Overall, Marsh et al.¹⁰ and Moss et al.¹¹ capture the major theme of the WHO/UNICEF recommendations to reduce the persisting high maternal and neonatal mortality in the developing countries. Using well-recognized milestones from pregnancy to parturition, these authors provide paradigms for recognition of danger signals and appropriate interventions.

They identify various areas of existing gaps in knowledge that influence the high neonatal mortality in the developing countries. They also provide pathways to recognize danger signals and interventional algorithms to improve neonatal care. These are very practical suggestions that can be adopted by the community health workers. Most importantly, the authors identify several critical areas for future research in perinatal and neonatal problems in the developing countries.

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