

United Nations Children's Fund
Regional Office for South Asia



What Works for Children in South Asia NEWBORN CARE: AN OVERVIEW

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What Works for Children in South Asia
NEWBORN CARE: AN OVERVIEW

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Regional Office for South Asia, 2004

For further information, please contact:

Health and Nutrition Section
UNICEF Regional Office for South Asia
P.O. Box 5815, Lekhnath Marg
Kathmandu, Nepal
E-mail: rosa@unicef.org

Cover Photo: UNICEF/Binita Shah
Design and Layout: Format Printing Press, Kathmandu, Nepal

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Acronyms

AKU	-	Aga Khan University
ANM	-	Assistant nurse midwife
ARI	-	Acute Respiratory Infection
BBF	-	Bangladesh Breastfeeding Foundation
BCC	-	Behavioral Change Communication
BFHI	-	Baby Friendly Hospital Initiative
BINP	-	Bangladesh Integrated Nutrition Program
BMI	-	Body Mass Index
BNF	-	Bangladesh Neonatal Forum
BPHC	-	Bangladesh Population and Health Consortium
BPS	-	Bangladesh Pediatric Society
BPS	-	Bangladesh Perinatal Society
BRAC	-	Bangladesh Rural Advancement Committee
CARE	-	Cooperation for American Relief Everywhere
CBNC	-	Community Based Nutrition Program Component
CC	-	Community Clinic
CEDPA	-	Center for Development and Population Activities
CHW	-	Community Health Workers
CINI	-	Child In Need Institute
CPSP	-	College of Physicians and Surgeons
DFID	-	Development Fund for International Development
EPI	-	Expanded Program of Immunization
ENC	-	Essential Newborn Care
EOC	-	Emergency Obstetric Care
FWAs	-	Family Welfare Assistants
FWVs	-	Family Welfare Visitors
HAs	-	Health Assistants
HMG	-	His Majesty's Government
HPSP	-	Health and Population Sector Program
JHU/CCP	-	Johns Hopkins University/Center for Communications Program
JHPIEGO	-	John Hopkins University International Education and Training in Reproductive Health
ICDDR,B	-	International Centre for Diarrhoeal Disease Research, Bangladesh
ICH/L	-	Institute of Child Health/London

ICMH	-	Institute of Child and Mother Health
IDA	-	International Development Agency
IMCI	-	Integrated Management of Pregnancy and Childhood Illnesses
IMPAC	-	Integrated Management of Pregnancy and Childbirth
INFS	-	Institute of Nutrition and Food Science
KMC	-	Kangaroo Mother Care
LBW	-	Low Birth Weight
MCH	-	Maternal and Child Health
MCHWs	-	Maternal and Child Health Workers
MIRA	-	Maternal and Infant Research Activity
MNC	-	Maternal and Newborn Caregivers
MNH	-	Maternal Neonatal Health
MoH	-	Ministry of Health
MoHFW	-	Ministry of Health and Family Welfare
NGOs	-	Non-Government Organizations
NWFP	-	North West Frontier Province
OGSB	-	Obstetric and Gynecology Society of Bangladesh
PATH	-	Program for Appropriate Technology in Health
PRB	-	Population Reference Bureau
RHSP	-	Reproductive Health Service Package
SCF	-	Save the Children Federation
SEARCH	-	Society for Education, Action, and Research in Community Health
SM	-	Safe Motherhood
SMP	-	Safe Motherhood Program
SNL	-	Saving Newborn Lives
STI	-	Sexually Transmitted Disease
TBA	-	Traditional Birth Attendants
UNICEF	-	United Nations Children's Fund
USAID	-	United States Agency for International Development
VDC	-	Village Development Committee
WHO	-	World Health Organization

Introduction

Newborn care is of immense importance for the proper development and healthy life of a baby. Although childhood and infant mortality in South Asia has reduced substantially during the last decade, the rate of neonatal mortality is still high. According to one source, 60% of all neonatal deaths and 68% of the world's burden of perinatal deaths occur in Asia (Paul and Beorari, 2002). Further, although 70% of infant deaths occur during the first month of life, the policy-makers and health professionals in developing countries, until recently, neglected newborn care (Costello and Manandhar, 2000). On the other hand, this latter group of authors maintain that the principles of essential newborn care are simple, requiring no expensive high technology equipment: resuscitation, warmth to avoid hypothermia, early breastfeeding, hygiene, support for the mother-infant relationship, and early treatment for low birth weight or sick infants.

Newborn care often receives less-than optimum attention. Although, over the past 25 years, child survival programs have helped reduce the death rate among children under age 5, the biggest impact has been on reducing mortality from diseases that affect infants and children more than 1 month old. As a result, the vast majority of infant deaths occur during the first month of life, when a child's risk of death is nearly 15 times greater than at any other time before his or her first birth.

Unlike infant and under five mortality rates, reductions in neonatal mortality have been less in the developing countries (Darmstadt 2000). The average infant mortality rate worldwide has dropped from 95 per 1,000 live births in 1993 to 60 per 1,000 live births in 1995 (Costello, 1995; Stembera, 1990). But the progress in reducing perinatal and neonatal mortality in South Asia region has been distressingly low despite improvement in childhood and infant mortality rates in the last two decades. Table-1 shows newborn health status for countries in South Asia. It can be observed from the table that both neonatal and perinatal mortality rates are highest in Pakistan (51 and 68-81 respectively), followed by Bangladesh (50 and 57 respectively). The issues of perinatal and newborn infant health, therefore, require focused attention in South Asia.

Table 1: Newborn health status for countries in South Asia

Countries	Neonatal mortality rate	Infant mortality rate	Child mortality rate	Under-five mortality rate	Perinatal mortality rate
Bangladesh	50	80	33	110	57
Bhutan					
India	47	74			44
Maldives					
Nepal	39	61-64			57
Pakistan	51	91	30	117	68-81
Sri Lanka	13	15			

Source: NIPORT et al. 2001, Save the Children 2001, Save the children 2002, Costello and Dharma 2000.

It has become increasingly evident that any further impact on infant mortality, or achievement of millennium development goals, world fit for children goals and UNICEF MTSP target, is not going to be realized unless neonatal mortality rate is dramatically reduced. Except for congenital anomalies, neonatal deaths are quite amenable to reduction through various interventions. International agreements have affirmed the world's commitment to improving newborn health, and recent global assessments have confirmed that doing so makes good social and economic sense.

Only in the past decade has the health of newborn infants in developing countries attracted attention from governments and international agencies, till today the health problems of newborn infants remain neglected and interventions to reduce early neonatal mortality are not a high priority for investment. Cultural adherence to high neonatal wastage and poor information about perinatal deaths are responsible for such negligence. Moreover, widespread misconception about the high expenses and necessity of advance technology equipment for neonatal care is also a big concern.

Most of the neonatal deaths can be prevented with cost-effective solutions that do not depend on highly trained provider or sophisticated equipment. Proper nutrition and hygiene are the answers in many cases, while other deaths can be prevented by using widely available vaccines and medications to prevent and treat infections, by having skilled health care at hand during and after delivery, by recognizing and promptly treating obstetric complications, by keeping the baby warm and the umbilical cord clean, and by improving breastfeeding and family planning

practices. By following low-cost principles of newborn care laid down by the French obstetrician Pierre Budin, 1907 in his classic work “The Nursing”, as shown in Table- 2, and by looking after the health of the expectant mothers — before, during and after delivery — many of the causes of the newborn death can be prevented before they occur.

There are several approaches to reducing newborn deaths that have proven to be both feasible and cost-effective including tetanus toxoid immunization, skilled health care delivery, immediate and exclusive breastfeeding. Therefore, improving newborn health is not a matter of developing new solutions to the old problems; but rather a matter of applying, replicating and scaling up the proven solutions via existing mechanisms. In other words, the real challenge is to spread up the awareness of sound newborn health practices or “what works” to those who need it, especially mothers, other primary caregivers, and health providers, and to integrate essential newborn health care into existing maternal and infant care programs.

There is a dearth of analytical documentation of evidence-based knowledge on “what works” in improving newborn health and its wider dissemination to the maternal and child health program managers in South Asia. In recognition of this potential, the UNICEF Regional Office of South Asia wishes to document, analyze, and disseminate the newborn health program experience of South Asia to the maternal and child health program managers.

Table 2: 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 breast feeding, 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

Source: Wigglesworth 1980, Stoll, B. 1997, Hovatta, O et al 1983, Huang DY 2000, WHO 1996, Child Health Research Project, 1999, Van Dam, 1995.

This documentation of “what works” in newborn care is an attempt to provide a source of evidence-based knowledge in improving newborn health that may be used by the policy makers and the program managers. The method followed is a non-systematic review of newborn care interventions in the South Asia region, based on readily available literature. Using a combination of manual and internet searching, the review covered a few of the following: program documents, annual reports, country papers, and published research articles.

Objectives

The objectives of the documentation are to:

- Review the published and unpublished literature on “best practices” in newborn health in South Asia, and identify gaps in current knowledge and understanding;
- Identify institutions implementing successful newborn health programs in South Asia and to document and disseminate “what works”, including key lessons learned;
- Develop recommendations and opportunities for replication and /or scaling up of the effective newborn interventions at the country level.

Causes of Newborn Death

Newborn deaths result from a combination of medical causes, social factors, and health system failures that vary by context and culture. In most settings, newborn health is closely associated with maternal health (Belsey, 1992). Paul and Beorari (2002), however, observe that factors contributing to the high newborn mortality rates in South Asia include widespread LBW, lack of skilled health care at birth, and low levels of exclusive breast-feeding in the initial months of life.

There is a lack of community-based data on causes of neonatal deaths, many of which occur at home. Various studies (Wigglesworth 1980, Stoll 1997, Havatta *et al.* 1983, Huang 2000, WHO 2001, Child Health Research Project 1999, Van Dam 1995) show birth asphyxia/birth injuries, infections, complications of pre-term birth and birth defects as major causes of fetal-neonatal death (Table-3).

Maternal sexually transmitted infections (STI) are a major, preventable cause of stillbirth. WHO (1991) and Van dam (1995) reported that STI could cause spontaneous abortion, low birth weight baby, congenital abnormalities, neonatal infections, and blindness. The estimates in Table-4 of neonatal mortality by major causes of neonatal mortality are mostly based on hospital data, which may not be representative. Every year babies are dying for asphyxia and birth injuries, infection and birth defects.

Statistics of different studies in conducted in South Asian countries show similar picture of causes of neonatal mortality (Islam *et al.* 1982, Baqui *et al.* 1998, Akther *et al.* 1999, Manandhar 2000, Bhutta 2000, Ellis *et al.* 1996, Roghani and Muhammad 1983, Haneef *et al.* 1985, Choudhry *et al.* 1992, Abbass 1995, Khan *et al.* 1993, McCormick 1994, Aga Khan services 2000).

Another important concern is low birth weight babies. An estimated 11 million children in South Asia are born each year at weights less than 2500 grams, amounting for over 50 percent of all LBW neonates in the world (Paul and Beorari, 2002). Infants born with low birth weight suffer from extremely high rates of morbidity and mortality from infectious

Table 3: Major Causes of fetal-neonatal death

Late fetal deaths (28 weeks up to delivery)	Early neonatal (0-7 days)	Late neonatal death (8-28 days)
Fresh still birth <ul style="list-style-type: none"> ● Intrapartum birth asphyxia ● Preterm birth ● Birth defects 	<ul style="list-style-type: none"> ● Birth asphyxia/ birth injuries ● Infection <ul style="list-style-type: none"> - Sepsis - Meningitis - Tetanus - Acute lower respiratory infection - Diarrhea 	<ul style="list-style-type: none"> ● Infection <ul style="list-style-type: none"> - Sepsis - Meningitis - Tetanus - Acute lower respiratory infection - Diarrhea
Macerated still birth <ul style="list-style-type: none"> ● Infection, especially syphilis ● Hypertension/pre-eclampsia ● Placental abruption ● Birth defects ● Maternal diabetes ● Post-term pregnancy (more than 42 weeks gestation) 	<ul style="list-style-type: none"> ● Complications of preterm birth <ul style="list-style-type: none"> - Respiratory distress - Jaundice - Increased risk of sepsis ● Birth defects 	<ul style="list-style-type: none"> ● Early feeding failures (more common for preterm and LBW babies) ● Infanticide/neglect
Estimated annual total 4 million	2.9 million	1.1 million

Source: Wigglesworth 1980, Stoll, B. 1997, Hovatta, O et al 1983, Huang DY 2000, WHO 1996, Child Health Research Project, 1999, Van Dam, 1995.

diseases, and are underweight, stunted or wasted, beginning in the neonatal period through childhood. Low birth weight infants have higher mortality rates during the postnatal period and in some cases their risk may be greater than those of the low birth weight infants during the neonatal period. Infants weighing 2000-2499 grams at birth are 4 times more likely to die during their first 28 days of life than infants who weigh 2500-2999grams, and 10 times more likely to die than infants weighing 3000-34999 grams. Table-5 shows the prevalence of low birth weight babies in South Asia.

Newborn care is very important in preventing neonatal deaths, particularly essential care of the normal newborn to prevent illness, extra care of low birth weight babies, and access to quality emergency care for the sick

Table 4: Major causes of Neonatal Mortality

Cause of death	Percentage	Number of deaths/year
Birth asphyxia/trauma	29	1,160,000
Prematurity	24	960,000
Pneumonia	15	600,000
Congenital anomalies	10	400,000
Neonatal sepsis	9	360,000
Neonatal tetanus	7	280,000
Other	29	200,000
Diarrhea	24	40,000
Total	100	4,000,000

Source: Save the Children, The state of the World's Newborns, Washington, DC, 2001. Number calculated assuming four million neonatal deaths.

Table 5: Prevalence of low birth weight babies in South Asia

Countries	Percent Prevalence	Number of Infants/year
Afghanistan	20	228,000
Bangladesh	50	1,752,000
Bhutan	15	11,400
India	21.8	8,081,000
Maldives	18	2,000
Nepal	30-50	235,800-393,000
Pakistan	25	1,337,000
Sri Lanka	18	59,000
Total	28	11,800,000

Source: United Nations Children's Fund (UNICEF)- Reduction of Low Birth Weight: A South Asia Priority

newborn. However, many of the causes of neonatal deaths, such as asphyxia, respiratory distress in a pre-term baby, and early sepsis are related to the health or care of the mother. The main causes of neonatal deaths are poor pre-pregnancy health, and inadequate care during pregnancy and delivery.

Newborn care is strongly influenced by women's social and health status and by home care and practices for mother and newborn, as well as by maternal and newborn cares services (Rodolfo et al. 2000). Traditional care practices at home and in the community inevitably affect maternal and newborn health. In the countries of South Asia women often have many children who are closely spaced, women maintain their full workload during pregnancy and restrict their diet due to fear of delivering

a big baby. Women are valued less than men. This attitude may manifest through female infanticide, limited access to food, lack of educational opportunities, restricted mobility, lack of participation in decision-making, early marriage, dominance of mothers in law, expectation to bear many children, heavy workloads, physical and emotional abuse and inadequate access to health services. Lack of understanding of the urgency attached to newborn illnesses or obstetric emergencies, traditions of seclusion of mother and newborn, fatalistic outlook, belief in evil spirits, and lack of family finances to pay for care and transport also cause delay in deciding to seek care.

Interventions to Improve Newborn Health: South Asia Experiences

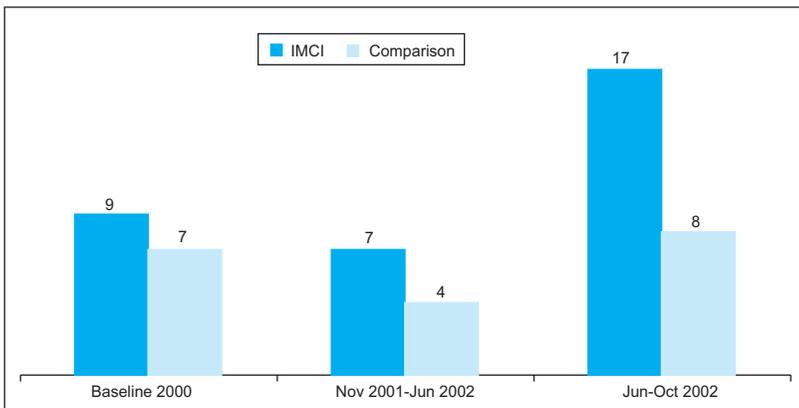
Policy

During the last couple of decades, there has been global consensus to strengthen safe motherhood and reproductive health programs. These programs have received attention in countries of the region where the problem of high maternal mortality is alarming. Moreover, political commitment to neonatal reduction has been made. It is articulated as Millennium Development Goal of reduction of under five mortality rates by 50 percent of the levels in 1990 to be achieved by the year 2015. But, at present, neonate issue is invisible within the policy in most countries of the region and thus, it will be difficult to reach the Millennium Goals unless the neonatal mortality declines by more than 50 percent. Programs of safe motherhood and child health and strategies of Integrated Management of Pregnancy and Childhood illnesses (IMCI) and Integrated Management of Pregnancy and Childbirth (IMPAC) are being implemented in some of the countries of the region. In India and Bangladesh, neonatal care has been included as an integral component of essential service delivery or primary health care. In Pakistan the agenda of Safe Motherhood, which advances newborn health, has recently gained attention and has been included as an important component of the Reproductive Health Service Package (RHSP). Neonatal health is not by itself the focus of any existing policy of the government of Nepal. However, Nepal government's decision to undertake a Safe Motherhood Program (SMP) in ten districts of the country has given a boost to neonatal care, as the SMP package includes the care of newborns. During the 1990s, the countries in the region instituted a number of programs including the Child Survival Program, Baby Friendly Hospital initiatives, acute respiratory infection (ARI) control program, and training of traditional birth attendants (TBA), the Extended Program of immunization (EPI), Control of diarrheal diseases, the National Program for family planning and Primary care, the RHSP and IMCI. Currently all these programs are active and in various phases of implementation. Despite these plans, neonatal care policy has been low on the list of policy priorities.

Integrated Management of Childhood Illness (IMCI)

The IMCI strategy addresses the most common causes of child mortality and case management of the five major diseases in children under five years: bacterial pneumonia, diarrhea, malnutrition, measles and malaria. The IMCI directed through improvement of skills of health workers, strengthening of health systems, and improvement of community and family practices. The algorithm that has been adopted has been classified into two different age groups: '1 day to 2 months' and '2 months to 5 years'. IMCI has been modified to include the neonatal period. The Government of Bangladesh and Pakistan are implementing the IMCI on pilot basis. The project has ensured a steady supply of drugs and other supplies to the intervention facilities with intensive monitoring and supervision. Ministry of Health and Family Welfare of the Government of Bangladesh and ICDDR,B are undertaking a five year impact evaluation of IMCI in Matlab upazila. This initiative is part of the global Multi-country Evaluation of IMCI supported by WHO and USAID. Initial evidence shows an increase in care-seeking from appropriate healthcare providers for sick children aged less than 5 years in the second half of 2002, following the full implementation of facility-based IMCI in early 2002.

Fig.1: Care-seeking from appropriate providers (health facility, doctors, paramedics, community based GOB/NGO health workers) for any illness of children aged less than five years in the last 2 weeks



Source: ICDDR, B: Center for Health and Population Research, Annual report 2002

Promoting institutional deliveries and integrated maternal and child health care

Sri Lanka has a total population of 18 million with about 367,000 births per year. The development and health indicators are generally good. Total fertility is low (2.4), contraceptive prevalence high (62%) and female literacy almost universal (above 85%). With a strong political commitment and a health infrastructure that permeates into the remotest areas of the country it has made great strides in health parameters such as neonatal and infant mortality, and life expectancy. Most of the births are occurring at the institutions and deliveries are under supervision of trained staff.

Many factors have contributed to the reduction of neonatal mortality in Sri Lanka:

- a strong political priority given to health;
- the establishments of a network of primary health care facilities with a strong emphasis on maternal and child health;
- tertiary care centers and base hospitals have pediatricians and obstetricians who have been provided with post-graduate training in neonatology and obstetrics, while district hospitals are managed by medical officers with basic training in MCH including neonatal care and the primary care hospitals have either medical officers and/or midwives trained in MCH and basic neonatal care;
- all tertiary and secondary care units and most primary care hospitals have ambulances while others have access to ambulances at the closest hospital;
- universal adult franchise in post-independent Sri Lanka;
- free education at primary and secondary levels for both boys and girls;
- food subsidization;
- high level of female literacy;
- subsidized public transport;
- a very active basic and in-service training program in maternal and child health for health personnel.

In spite of Sri Lanka's achievements in reducing neonatal mortality, there are still areas of concern in relation to perinatal care.

Dinajpur Safe Motherhood Initiative

From the 1998-2001, the Government of Bangladesh, CARE, and UNICEF implemented the Dinajpur Safe Mother Initiatives. Activities included:

- assisting couples to develop a birth plan that included information on danger signs, how to access services, and ways to facilitate mobilization of resources for services;
- developing behavioural change communication strategies to raise awareness about and create demand for maternal health services, including emergency obstetric care;
- establishing community supports that increase utilization of appropriate services when needed, including transportation, communication, and funds for medical services;
- strengthening the ability of government health service providers to enhance their capacity to provide high-quality emergency obstetric care services; and
- strengthening the linkages between the community and the health personnel through stakeholder committees

After three years the results of this project showed an increase in the met need of obstetric care services from 17 percent to 39 percent. Other achievements included an increase in the knowledge of dangers signs among women and key decision makers. Government health workers, community health workers, schoolteachers, and community leaders were all key stakeholders involved in the process. Through the committees, communities felt that they were able to make a valuable contribution to addressing this problem. Families are more aware of the risks of pregnancy and the role of family planning in women's health. Communities now recognize the potential impact of a maternal death and know how to avoid this. The program is now incorporating focus on newborn survival (Hossain and Ross 2001).

Community–Based Interventions in the Care of Low Birth Weight (LBW) babies

A community based longitudinal intervention study, which was carried out in Haryana, India to determine the impact of supervised care on survival of LBW babies. A simple package comprising prevention of hypothermia, early initiation and exclusive breastfeeding, management of diarrhea and pneumonia and referral of sick babies was used. The package was implemented in the existing health system. The training materials were developed according to the tasks assigned to the health care providers by the government. Training strategies were used to ensure interactive training, with emphasis on skill development and ongoing training to solve problems and correct deficiencies. Matrices were developed to identify care components in the family, community, sub-centers, health centers and hospitals. In the delivery of supervised care of LBW babies, a team approach was used. Medicines and other supply logistics were consistent with the policy of the state government. Traditional practices were identified and an effort made to overcome the common harmful practices in the community.

There was significant decline in neonatal mortality rate in LBW babies. But the death decline in post neonatal period was more pronounced. Amongst the causes of death those related to feeding problem and birth asphyxia decreased and those related to sepsis also declined. Knowledge of mother in essential newborn care was significantly improved in intervention areas than in control areas. Practices related to keeping the baby warm, feeding colostrums, and clean deliveries were adopted in the intervention area. The experience in the study was utilized in community-based research on birth asphyxia management and further intensification of conducting clean delivery ((Hossain and Ross 2001; WHO 2002).

Bangladesh integrated nutrition program (BINP)

The Bangladesh integrated nutrition project, with support from the government of Bangladesh, the World Bank, UNICEF, and several other organizations, was implemented in 1995. The largest component of the project, the community based nutrition program component (CBNC), has become one of the most promising large scale community based projects in the world aimed at reducing childhood and maternal undernutrition.

This comprehensive project now targets over one million households in 23 project areas called thanas. The findings of a study performed under the ICCDR, B-BINP operations research project indicate that improvement in birth weight is achieved but only when supplementation is initiated early in pregnancy and continued for at least 120-150 days up to delivery (Shaheen et al. 2000). During two and half year of project implementation, it was reported that there is substantial improvement (2.3 percent point reduction) in the prevalence of low BMI in the women of childbearing age. Following table shows the improvements in knowledge in some health and nutrition related behaviors between the project and control thanas but there has been relatively little effect on the practice of exclusive breastfeeding, or on the nutritional status of pregnant and lactating women (Dhaka University, 1999; Government/ UNICEF/ IDA, 1999).

Table-6: Differences between women in project and control thanas regarding health and nutrition related behaviors

Behavior	Project (%)	Control (%)
Initiated breastfeeding immediately after birth	60	31
Fed colostrums to newborns	94	76
Ate addition food during pregnancy	56	22
Visited by health worker for antenatal advice	94	75
Received tetanus toxoid immunization (women 14-49yrs)	84	69
Use of sanitary latrines	19	09

Source: BINP Midterm Evaluation (1999) INFS; Dhaka University

Home based newborn care package

During a 4-year period, home based newborn care was introduced in 39 villages; with a control of 47 similar villages, in Gadchiroli district in Maharastra, India, by an NGO, SEARCH. Traditional care practices in the area were studied carefully before the package was designed. The newborn care package included the following:

- Preparation and education of mothers during pregnancy, especially training for essential care of their babies with use of a photo album of pictures, flip chart, and discussions;
- TBAs are trained to reinforce health-promotion beliefs and practices;

- Community health workers (CHWs) trained in newborn care, including
 - resuscitation skills;
 - weighing the newborn at birth using a spring balance, and giving vitamin- K injection;
 - visiting the mother and baby eight times in the first month to assist with breastfeeding and warmth, early detection of illness, and reweighing of the baby;
 - detecting high-risk babies, especially those weighing less than 2 kg, to be visited more often;
 - diagnosing neonatal sepsis using simple clinical criteria and treating with antibiotics at home (injection gentamicin and syrup co-trimoxazole); and
 - managing other neonatal problems, such as breastfeeding difficulties, conjunctivitis, skin or umbilical infections.

- Visits by a doctor or nurse to each village twice a month to supervise and support the CHWs.

By the third year, 93 percent of newborns in the intervention areas were receiving home based care. SEARCH was able to record 98 percent of births and child deaths in the area. Neonatal mortality was reduced by 62 percent, mostly as a result of fewer deaths from neonatal sepsis. No complications due to the injections were detected, possibly because the CHWs were carefully trained and well supervised. The package was estimated to cost US \$5.3 per newborn, and one death was avoided for every 18 babies who received care. The estimated cost-per-life saved was US \$95.4, which is less than the cost-per-life saved with measles vaccination (Bang et al 1999, *The Lancet*, vol. 354).

Clinic and community approach to maternal and child health

The Child In Need Institute (CINI) began as a small clinic in 1974 in Thakurpukur, on the southern outskirts of Calcutta City. The clinic served the needs of mothers and their children suffering from moderate to severe under nutrition and diarrhea. CINI has adopted a holistic lifecycle approach in 70 villages to reach a total of at least one million people. This approach includes organizing women's groups and providing support to poverty stricken families to improve their income and functional literacy. The CINI program has three components:

- case management, which increases the coverage of antenatal care and helps prevent repeated pregnancies in quick succession;
- behavior change communication strategies which aim to increase awareness and improve interpersonal communication;
- 'linkage' which aims to strengthen existing health care facilities and improve linkages within the community.

The internal reporting systems of the project suggest that in CINI villages, LBW has been reduced by one-third, more women have been identified early in their pregnancy and have been registered at the clinic, and attended deliveries have increased. The proportion of pregnant women eating extra food, and the proportion of pregnant women resting during the last trimester of pregnancy has both reportedly been increased (CINI, 2000).

Neonatal Resuscitation

WHO estimates that approximately one to five percent of babies will require resuscitation at birth and many of them may die or suffer from long-term disabilities. However, oxygen and more complex procedures, such as endotracheal intubations, are not necessary to save most of these newborns. An international study found that 80 percent of babies requiring resuscitation needed only a bag and mask (ambul bag) and room air (Saugstad et. al., 1998).

The 'Traditional' resuscitation is widely practiced in South Asia. Such practices that should be discouraged include:

- slapping, blowing on, or pouring cold water on the baby;
- holding the baby upside down;
- routine suctioning of the mouth and nose of a well baby;
- heavy suctioning of the back of the throat of any baby; and
- giving injections of respiratory stimulants or routine sodium bicarbonate injections.

The main barriers to effective resuscitation are lack of competent staff and lack of simple equipment. The neonatal group of the Pakistan Pediatrics Association launched a national newborn resuscitation training program in 1994 up to October 2001 over 100 national resuscitation training workshops on the prevention and effective management of birth asphyxia have been held in 30 cities. A pilot project of Aga Khan University (AKU) and UNICEF had been launched to improve the resuscitation skills of physicians, nurses and midwives at the Rural Health Center and Taluka level hospitals in Hala and Mattiari. This program has complemented the existing Emergency Obstetrics Care (EOC) initiatives of Colombia University and assesses the impact of these measures on perinatal outcomes. Kumar (1994) conducted a study in rural communities in India to evaluate the effect of training on the resuscitation practices of Traditional Birth Attendants (TBAs). From 8 to 100 TBAs attended training on the resuscitation techniques in an area near Chandigarh, India. These trainings were performed in response to the Primary Health center's findings that TBAs relied on traditional methods of resuscitation, such as instillation of onion juice in the nostrils, milching of the umbilical cord, and warming the placenta. TBAs were trained in several resuscitation techniques, including:

- gravity drainage of secretions and cleaning the mouth with a finger wrapped in gauze;
- physical stimulation by flicking at the soles of the feet;
- mouth-to-mouth resuscitation and cardiac massage;
- prevention of heat loss by wrapping the baby in multiple layers of cloth; and
- some TBAs were later trained to use a mucus extractor and bag-and-mask ventilation.

Results showed that most of the trained TBAs used a combination of traditional and modern resuscitation methods (30 of 45 babies). Thirteen babies were resuscitated with modern methods alone. Only two TBAs exclusively used traditional resuscitation methods. Among 21 cases delivered by the TBAs who had received advanced training, mucus extractors and bag-and-mask were used in 33.3 percent and 42.6 percent of cases, respectively. Adoption of modern resuscitation methods by

TBAs who received advanced training, demonstrates that after training they are likely to change their practices. However, no data were available on outcomes for the babies or as to whether the asphyxia could have been prevented by improved intra-partum care.

Social Marketing of Clean delivery kits

Cleanliness at delivery at home would be a major step forward in reducing the risk of infection for the mother and baby, especially neonatal sepsis and tetanus. Cleanliness requires mothers, families, and birth attendants to avoid harmful traditional practices, and prepare necessary materials. Hand washing, finger nail cutting, delivery in a clean surface, clean cord cutting and tying cord with clean thread are emphasized for safe delivery. To facilitate the promotion of cleanliness at birth, the use of clean delivery kits were tested in Nepal. The concept of clean home delivery kits was developed in Nepal by PATH, UNICEF, and Save the Children-USA (Tsu, 2000; PATH, 1999). The components in the kit were sealed in a plastic bag and included:

- 1 small piece of soap for hand washing
- 3 pieces of string for trying the cord;
- 1 new stainless-steel blade for cutting the umbilical cord;
- 1 plastic sheet to serve as the clean delivery surface; and
- pictorial instructions showing how and in which sequence to use the kit components, with an emphasis on hand-washing.

The kits in Nepal were developed through needs assessments and field trial research. The contents are pre-assembled by a self-sustaining business run by local women and are made available for sale from small shops, health posts, medical stores, health volunteers, and TBAs. Over the past five years these kits have been advertised through several social-marketing techniques:

- The Ministry of Health promoted the kits in Safe Motherhood campaigns;

- Radio spots were broadcast, and advertisements were shown in cinema hall;
- Local and international NGOs promoted the kits at the community level;
- Posters, flashcards, banners, village billboards, and flyers gave information about the kit;
- Street dramas were performed; and
- Mobile units with speaker systems promoted the kits at community markets.

An evaluation of clean delivery kits was carried out in three districts in Nepal during 1998. Over 90 percent of those who did not use a kit still used a new or boiled blade to cut the cord, possibly influenced by the social marketing campaign. Untrained birth attendants who used the kit were much more likely to wash their hands than those not using the kit (91% compared to 76%). Kit users were more likely to use soap among both trained (96% vs. 73%) and untrained attendants (84% vs. 46%). Interestingly, less than five percent of mothers left the cord uncovered with nothing on it, even though this was the targeted behavior. Satisfaction with the kits was high, and more than 90 percent of users planned to buy kits again.

Keeping Newborn warm

Avoiding hypothermia (rectal temperature less than 36.5°C or 96.8° F) is important for newborn health outcomes because hypothermia increases morbidity and mortality. Low birth weight babies are more susceptible to becoming cold. The risk of losing heat is greatest when the baby is wet (i.e., just after delivery or bath). A baby can lose one degree of body temperature per minute when wet, even in a room that is not obviously cold. To prevent heat loss, it is necessary to dry up the baby and wrap the baby in a clean, dry cloth and to make sure the baby's head is covered (WHO, 1977). But in reality in the South Asian countries it had been observed that in most of the cases, the umbilical cord was not cut until the expulsion of placenta and till that time the baby was left on the labour bed (made of a species of aquatic grass/ plastic sheet/ jute sack/ straw).

During this time, neither the body of the newborn was wiped with dry clothes nor it was placed beside the mother. At this stage, all including the delivery attendant remained busy with the expulsion of placenta, as almost all of them believed that cord cutting and cleaning of the newborn were appropriate only after the expulsion of placenta. Thus hypothermia can easily occur in a new born who is left exposed and wet.

With a view to keep the newborns warm, the TBAs in Nepal were trained to take rectal temperatures. A study on this issue conducted by Levitt (1996) found that 58 percent of newborns born between January and March had a temperature of less than 35°C within 12 hours of birth. TBAs were trained to:

- Wrap/warm babies immediately instead of letting them rest on the floor until the cord was cut;
- Postpone bathing;
- Keep babies' heads covered.

These type of community initiatives demonstrate the importance of involving local stakeholders in needs assessment activities and the potential for teaching important techniques to TBAs.

Breastfeeding

Despite the well-known advantages, early and exclusive breastfeeding require active support at all levels of care. The family members including the delivering mothers offered various explanations as reasons of not breastfeeding the babies before giving bath to them, which were as follows: the newborn was not sucking the breast; there was a shortage of milk in the mother's breast immediately following delivery; it was not a practice in the area to breastfeed the baby when both the mother and the baby were unclean and impure; it was not possible to breastfeed the baby because either the baby or the mother was sick; it was not a practice in the area to breastfeed the baby on the first day or (in some cases) within three days of its birth; and the Dai advised not to breastfeed before giving bath to the baby.

Support for individual women is crucial. Helping the mother to position the baby correctly to avoid sore nipples and answering her concerns can

increase a woman's confidence in her ability to provide adequate nutrition to her newborn. Every woman needs full support from those around her to enable her to initiate and sustain breastfeeding (Amin 1996).

The baby friendly hospital initiative (BFHI) is another effort at supporting organizations, health workers, breastfeeding advocates, and policy makers. Facilities had been designated as 'baby-friendly'. The progress has been achieved through effective partnerships at all levels (governmental, community, institutional and individual). This initiative has improved both mother and child health and breastfeeding (Thorley et al. 2000).

Training in Essential Newborn Care (ENC)

The Reproductive Health Program of the College of Physicians and Surgeons (CPSP) has developed a core curriculum on reproductive health for inclusion in the undergraduate curriculum that has been approved by the Pakistan Medical and Dental Council. The CPSP conducted over 30 workshops on reproductive health and trained nearly 1000 health professionals. The reproductive health program of physicians and surgeon also included an extensive module on primary perinatal and newborn care. In addition, the CPSP has approved a postgraduate Neonatology Fellowship Training Program in four centers. Similarly, the Aga Khan University (AKU) Medical Center has launched a Neonatal Nursing Certificate Course that has attracted a number of nurses from Karachi. The Khyber Teaching Hospital in Collaboration with DFID has launched a similar program for training nurses in newborn care in NWFP. These activities hold much promise in terms of improving the status of perinatal and newborn care in urban settings. As already indicated, the need is to train staff and caregivers at primary care level and hopefully this may become a focus of attention.

The AKU Medical College-Department of Pediatrics and Department of Community Health Services housed the first neonatal tertiary services in Pakistan and were able to initiate training in secondary and tertiary newborn care. This was followed in 1992 by a training program in neonatal nursing. The AKU School of Nursing is also running the only neonatal nursing certification course in Pakistan to provide rotational training to resident staffs from other teaching hospital of Karachi. Apart from hospital-based clinical research in multiple aspects of newborn health such as infections, respiratory disease and birth asphyxia, the

department has undertaken and planned community-based projects in the field of perinatal and newborn care. This includes

- Micronutrient deficiency evaluation in normal and LBW infants and the impact of multiple micronutrient supplement on growth, morbidity and neurodevelopment outcome (1999-2002: funded by ARCH/ USAID)
- Maternal morbidity, malnutrition and work indices impact on birth outcome and birth weight in defined populations of urban and rural Sindh (1999-2001: funded by UNICEF)
- Knowledge, attitude and practices of community members and caregivers with regard to perinatal and newborn care in rural Sindh and Gilgit district. (2000-02 funded by AKU and UNICEF)
- Assessment of cause-specific perinatal and neonatal mortality in rural Sindh and Gilgit by a verbal autopsy (funded by Global Forum for Health Research and AKU).
- Impact of maternal nutrition education and micronutrient supplementation on pregnancy outcome, LBW and infant morbidity and growth. (2001-2003: funded by UNICEF)
- Evaluation of simple clinical indicators for serious neonatal illness and the microbiology of neonatal infections at a community level in Karachi by first level health workers. (Probable start 2001: funded by WHO/ SNL)
- An evaluation of underlying factors behind the failure of the health System's response to perinatal and newborn care in Pakistan and blue print for action (2000-2001: funded by the Alliances for Health Systems and Policy).

A larger scale department of pediatrics has been designing a community-based intervention in Hala and Mattiari talukas, Sindh. The project will train the lady health workers and traditional birth attendants to deliver essential health care in the randomized cluster trial for 700,000. There will be concomitant strengthening of secondary care and referral facilities in these talukas in collaboration with UNICEF and MoH, government of Sindh.

Under the HPSP in Bangladesh, the care of the newborn has been considered as part of reproductive health within the setting of Safe Motherhood and EOC. However, the training module that has been prepared for newborn care within the purview of Safe Motherhood is not well developed. In view of this, the Institute of Mother and Child Health (IMCH) in Bangladesh has started a 5-day training course for Primary Health Care physicians on essential newborn care (ENC). With support from the government of Bangladesh, IMCH has trained more than 300 physicians in ENC.

Saving Newborn lives (SNL) program is also developing an ENC training package aimed at both professional and literate community-level providers. This generic package, now in its second draft, will include the following components:

- Reference manual
- Trainer's guide manual
- Learner's guide for professional providers
- Learner's guide for community providers
- Instrumental video of basic ENC skills

This training package is designed to be flexible and responsive to the specific needs of country programs. The package might be used by the trainers, providers, program managers, or training institutions in order to:

- Strengthen newborn component of curriculum in pre-service education
- Integrate entire program or selected components into existing in-service (e.g., safe motherhood or child survival) training program
- Use as a technical resource/reference
- Use selected modules for short training on specific topics such as breastfeeding
- Adapt entire program to reflect country guidelines

(Source: SNL Newborn News, Volume 2, issue 1, August 2003).

Various working groups are actively involved in the Bangladesh health sector including the Bangladesh Breastfeeding Foundation (BBF), Baby Friendly Hospital Initiative (BFHI), Bangladesh Perinatal Society (BPS), Bangladesh Neonatal Forum (BNF), Obstetric and Gynaecology Society of Bangladesh (OGSB), and Bangladesh Paediatric Association (BPA). Since neonatal health and neonatal mortality are multi-factorial, the resource base can be widened through the adoption of the strategy of mainstreaming and partnerships within the health sector and outside the health sector. From this consideration, SNL Bangladesh field office has adopted the *strategy of mainstreaming and partnerships* and is enhancing coordination and cooperation with a view to facilitating formation of a Newborn Working Group with professionals from different professional bodies, NGOs, private sector, academic institutions and development agencies.

Improving Newborn Health: Some New Initiatives in South Asia

Operational research in Makwanpur, Nepal

MIRA (the maternal and infant research activity), the Ministry of Health, Nepal and the Institute of Child Health/ London (ICH/L) are currently conducting an operations study in Makwanpur district. The purpose of the study is to improve essential newborn care in rural communities in Nepal by:

- Enhancing newborn care in the home and at health facilities through sustainable interventions.
- Evaluating the role of preventive and referral services in reducing neonatal mortality
- Increasing the availability of safe delivery kits and essential supplies
- To develop appropriate essential newborn care training modules for health workers with the help of district public health officer

The essential newborn care is comprised of the basic principles of resuscitation, avoidance of hypothermia, improvements in hygiene, early breast-feeding, and protecting mother-infant bonding. It also promotes antenatal care, the treatment or referral of high risk or sick infants. A key question the study will look at is whether mothers in resource poor communities can practice ENC more effectively. Networks of women who are interested in tackling ENC will be encouraged to identify, prioritize and plan for improvements. The interventions will be evaluated in randomized controlled trials in order to estimate their impact on neonatal mortality. Twenty-village development committee (VDC) was matched into 12 pairs: one VDC in each pair will receive the intervention from the beginning of the study, and the other VDC will receive it after two years. The evaluation will look at whether and how the interventions resulted in:

- Increased awareness of ENC and ways of approaching it in the community

- Increased number of deliveries attended by a trained person in a clean environment.
- Improved knowledge and skill of health workers
- Improved availability and use of antenatal care, safe delivery kits, and referral systems.
- New knowledge about the effectiveness of this sort of intervention in neonatal mortality
- New knowledge about the effectiveness of this sort of intervention and newborn health status

ICH/L-MIRA Multi-micronutrient Supplementation Project

Another collaborative research had been planned between MIRA and the Institute of Child Health, London. The effects of antenatal multi-micronutrient supplementation on birth weight, gestation, perinatal mortality and infection will be studied. Eligible women will be recruited at antenatal clinics of Janakpur hospital, Nepal and will be examined for the effects of birth weight, prevalence of preterm delivery, gestational age, maternal and neonatal infection, and neonatal morbidity. The study will also assess the acceptability of the supplementation to the enrolled participants. The total sample size will be 1200,600 in each of two groups. The women in group-I will receive free of charge the supplements currently recommended in HMG guidelines (iron, folic acid tablets), and the women in group-II will receive a micronutrient package from 24 weeks of gestation through delivery. The multiple micronutrient packages will contain vitamins A, B1, B2, C, D, E, niacin, folic acid, iron, zinc, copper, selenium, and iodine at levels recommended by recent WHO/ UNICEF guidelines. The daily supplements will be self-administered and will be provided through weekly home visits at which compliance will be monitored by pill counting. A card registration system will allow women participating in the trial expedited access to maternity services at the hospital. Community follow up will be carried out to collect morbidity and mortality information. This study, supported by UNICEF-Nepal, will contribute to global low birth weight reduction.

Maternal Neonatal Health Program

MNH Program/Nepal is a USAID funded project led by JHPIEGO in partnership with CEDPA and JHU/CCP that supports the National Safe motherhood program efforts providing technical assistance to promote the survival of mothers and newborns, MNH/Nepal has prepared a comprehensive report on maternal and neonatal health in Nepal. The specific objectives of the program are to:

- Improve the policy environment, facilitate coordination, and strengthen the capacity of the family health division of MoH;
- Increase the quality and services in maternal and neonatal health;
- Increase demand for the access to services;

Presently, MNH is:

- Helping to develop 15-year safe motherhood plan of action;
- Publishing a safe motherhood newsletter;
- Developing a safe motherhood training strategy;
- Working on message development and dissemination;
- Developing MNH training centers Helping to develop an SM training curriculum for ANMs and MCHWs;
- Conducting community based study/research related to SM issues;
- Developing a birth preparedness package.

Kangaroo Mother Care Project

In the Kangaroo Mother Care (KMC), a well pre-term infant, wearing only a diaper, is placed between the mother's breasts in skin-to-skin contact. Many studies all over the world have demonstrated improvements of the outcomes and other advantages of KMC, such as higher maternal satisfaction.

In a randomized control trial of pre-term babies weighing less than 1,500 grams in a hospital in Zimbabwe, Dr. Kambarami found that the infants allocated to KMC had better health outcomes than infants placed in a standard incubator setting. A longitudinal, randomized controlled trial conducted at the Isidro Ayora Maternity Hospital in Quito, Ecuador, studied the long-term benefits of KMC. The researcher found that after a 6-month follow-up the KMC group had a significantly lower rate of serious illness (lower respiratory tract disorders, apnea, aspiration, pneumonia, septicemia, and general infections) than did the control group (Child Health Research Project, 1999).

BRAC and Population Council (USA) have initiated Kangaroo Mother Care (KMC) Project to study the potential impact of skin-to-skin care for low birth weight (LBW) babies and its outcome. KMC is designed to overcome the limitations of institutional neonatal care. This four-year project aims to help reduce infant mortality in countries like Bangladesh where the incidence of LBW is high (50%) and most births occur at home (Save the Children 2003).

Projanmo-ICDDR, B Intervention Trial Community-based Newborn Care

The ICDDR,B Center for Health and population Research is conducting a study on community-based interventions to reduce neonatal deaths in Bangladesh (PROJANMO). The study was started in 3 upazilas of Sylhet district (Beanibazar, Zakigonj, and Kanaighat), and by the end of 2002, formative research and baseline household surveys have been completed, and staff training started in phases. The study uses a cluster randomized design to evaluate two alternative service-delivery strategies: home-based care and clinic-based care. The study is also designed to improve newborn care, recognition, and management of neonatal infections by mothers and the first-level health workers and to treat antimicrobial resistance. The project, supported by USAID, is being implemented in partnership with the Johns Hopkins University, Shimantik (a national NGO), Ministry of Health and Family Welfare, Dhaka Shishu Hospital, BRAC, and Institute of Child and Mother Health, and is funded by USAID and the Saving Newborn Lives Initiatives of SCF.

The following measures were included in the package:

- Antenatal care, including tetanus toxic immunization and iron-folate supplements
- Birth preparedness training
- Clean delivery
- Resuscitation of asphyxiated newborns
- Newborn thermal protection
- Exclusive breastfeeding
- Clean cord care
- Recognition of maternal and newborn danger signs and timely care-seeking;
- Early postnatal contact with a health provider; and
- Case management of serious bacterial infections.

The team's approach was based on locally endorsed measures and on current research and experience. The interventions were designed to provide the Ministry of Health and Family Welfare - a feasible and affordable way to improve newborn health and survival throughout Bangladesh by early 2005.

Identifying aetiology of neonatal infections in the community

This project was initiated by ICDDR, B in Mirzapur, Tangail, in partnership with the Johns Hopkins University, Oxford University, Kumudini Hospital, and Dhaka Shisu Hospital, and is funded by the Wellcome Trust. In addition to evaluating a package of obstetric and newborn care interventions, this study has a specific focus on identifying aetiology of neonatal infections in the community.

Saving Newborn Lives (SNL) Initiatives

In Bangladesh, SNL is implementing cost-effective, sustainable essential newborn care packages at community and household level through partnership with the government and leading NGOs like CARE, BRAC, BPHC.

An extensive formative research on household level practices in pregnancy, childbirth and newborn was undertaken in 14 upazilla in six administrative divisions in the country (Al-Sabir et. al 2003). The findings from the formative research along with findings of ICDDR, B 2003 helped formulating BCC strategies to promote newborn practice at all levels (household, community and family). It also helped to improve household practices through BCC strategies and influenced community to adopt Essential Newborn Care.

BRAC-SNL Project

BRAC, the largest national NGO in the country is implementing three distinct approaches in three separate project sites across the country. A project of Low birth weight is being carried out by BRAC in 187 villages of Nokla Upazilla of Sherpur District. The purpose of this project is to monitor all the low birth weight interventions currently in practice in this area as part of the BRAC's Nutrition facilitation program. The main aim is reduction of the birth of low birth weight babies, detect all LBW babies properly and assure that these babies get proper nutrition rehabilitation. The current activities of this project include

- Prenatal counseling on maternal nutrition on the premise that low birth weight can be markedly reduced if maternal nutrition is improved;
- Detection of low birth weight babies by taking their birth weight;
- Referral of low birth newborns to community nutrition centers;
- Nutrition rehabilitation of LBW babies at these centers;
- Education of mothers of low birth weight babies.

Another newborn care initiative is currently in action by BRAC in Chauddagram upazila of Comilla district. The project seeks to achieve its objective through counseling and education for families by way of extensive home visits. Three main objectives are to:

- Increase the number of safe deliveries;
- Increase the number of Antenatal care clinical visits;
- Decrease the number of problems related to lack of proper care during pregnancy and encouraging a healthy pregnancy. This subproject will focus on home visits to provide counseling and education to the family.

A third project of BRAC is at Dimla upazila of Nilphamari district. Essential newborn care practices and increased deliveries by skilled or trained birth attendants are the endpoint goals of this newborn care project. Ensuring clean home deliveries under skilled or trained health providers in all births, correct diagnosis, treatment and referral of sick newborns are the principal objective of the project.

CARE-SNL Project

CARE-SNL project will build on the community-managed approach towards improving newborn care. A key component of the project is capacity building of the Community Clinic (CC) management Committee (comprised of representatives of the five villages served by one Community Clinic) to ensure that community-based service providers like TBAs, Health Assistants (HAs) and Family Welfare Assistance (FWAs) are trained and motivated to provide essential newborn care. The project will be carried out in two upazilas (sub-districts) of Dinajpur District with a total population of approximately 200,000 in 160 villages. This will help to test different community based methods and approaches using existing Ministry of Health and Family Welfare (MoHFW) and community infrastructure to reduce neonatal mortality and morbidity.

BPHC-SNL:

Bangladesh Population Health Consortium (BPHC) and its affiliated NGOs are implementing activities to strengthen and improve in the essential newborn care in six upazilas. The Family Health Volunteer (FHV) is the focal point for the community-based essential newborn care that is comprised of counseling and education, community resource mobilization, and referrals of sick newborn. FHV coordinates the activities of TBA, paramedics, BCC Promoter, and community volunteers. The total population covered by the project is 224,649, with an estimated 12,577 pregnancies and 8000 live births.

SNL Initiatives, Nepal

SNL Nepal has identified two districts to implement cost-effective services for newborn health: Kailali and Siraha. In both areas, skilled attendance at birth is under 10 percent; prenatal care is low (under 45 percent); and newborn mortality rate is high (Kailali 64 and Siraha 51 per 1000 live births).

In Kailali, SNL's programs focus on behavior change – including the development of a BCC strategy, parenting education, and interaction sessions. Postnatal care is also being introduced through maternal and child health workers (MCHW), trained traditional birth attendants (TTBA), and maternal and newborn care caregivers (MNC).

In Siraha, SNL is working on BCC and operations research on the birth preparedness package developed by the Ministry of Health, Nepal, with the support of CEDPA. The package includes some essential newborn care elements and functions as family awareness-rising tool.

SNL will mobilize commitment and resources through advocacy at the political level, influencing policy through safe motherhood committee and network and lobby neonatal health causes amongst influential groups such as professional bodies, media and community leaders. It has been proposed to use set of global core indicators to monitor and evaluate neonatal health in the country (WHO 2002).

BASIC II Newborn Care Program:

BASIC II is providing community and household level care to the newborns through community mobilization, participation, behavior change and other appropriate community-based management strategies. It has been committed to advocating at all levels for neonatal health care issues. The technical strategies and intervention has been designed to provide health care to the following group of newborns

- All new babies need a fundamental level of services, especially preventive care, i.e. essential new born care
- Sick babies who required timely recognition of illness and access to the services for appropriate care and management
- Special vulnerable groups: provide additional preventive and curative care such as low birth weight babies.

BASIC in collaboration with WHO investigated steps to incorporate early neonatal period (1-6 days) in IMCI strategy. The technical focus area with MNH and WHO also produced training manuals on aspects of newborn care for health worker. The manuals addressed normal/essential newborn care as a routine part of care during pregnancy and childbirth and also the care of sick newborns (Basic 2000).

Community Newborn Care in West Bengal, India

In the state of West Bengal, a partnership has been established between government, UNICEF and National Neonatology forum and professionals. Complementary program supported by CARE, DFID, and GTZ are involved to strengthen essential newborn care. The strategies were to create an enabling environment where the well-being and survival of neonates were stressed. Selection of the most backward districts and provision of four resource persons in each district had achieved operationalization of neonatal care. Newborn corners in the neonatal wards in the hospital facilities have been established in 155 locations in the State. Medical doctors, nurses, supervisors and TBA had been trained. Simple and appropriate equipments and supplies at the community, health centers and hospitals were provided. The project has been taking small but definitive steps according to available capacity in state to improve and upgrade an essential neonatal care package everywhere (WHO 2002).

Conclusions and Recommendations

The review highlights a handful of proven, cost-effective solutions that can significantly help to reduce the number of children who die each year. It also shows simple and inexpensive technology or makeovers that can be helpful for the national health system.

Most of the strides were made to treat certain complications, such as asphyxia and infections in the newborn. The behavioral change aspects are still to be improved. However, community based or home based interventions showed positive results in changing the behavior of mothers or community.

The review draws attention to the need for a system of involving all parties in the community, including guidance on assessing the system, strengthening its capacity and improving the quality of its services. The review provides some inspiring examples to improve certain aspects of newborn care but prioritization is needed to identify which evidence based interventions are most effective and feasible in own setting.

Most of the approaches under review are not new, but it does require thorough examination and evaluation. One has to be very clear about what has worked in his or her environment and also there has to be opportunities to decide which interventions should be used. Of great importance is that there should have been opportunities to see rapid results.

Basic needs for any newborn care include breathing, warmth, cleanliness, feeding and love (Budin 1907; WHO 1996). Various studies show that good essential care of the newborn will prevent many newborn from health hazards. Some of the results of *Essential Newborn Care* interventions are shown in the table below. It shows that essential newborn care enhances normal growth and development and minimizes risk factors for complications.

Besides this, adoption of modern resuscitation method by TBAs demonstrates that after training they are likely to change their practices. By promoting clean delivery practices and educating women/families/

communities/skilled attendants on the importance of cleanliness is a major step towards reducing the risk of infection for the mother and the baby, especially neonatal sepsis and tetanus. Introducing a clean delivery kit through social marketing campaign helped untrained TBA or attendants to change their behavior. In Nepal TBAs were trained to take rectal temperatures and with that knowledge they demonstrated the stakeholders to wrap/warm up babies immediately after birth, postpone bathing and keep babies' heads covered.

Table 7: Effect of essential newborn care

Essential Care	Effectiveness	Reference/Source
Standardized resuscitation protocols	Highly effective in reducing neonatal mortality	Zhu et al. 1997
Tetanus	Preventable by immunization	WHO
Simple clean cord care: The umbilical cord is major source of infection in the early neonatal period, accounting for the majority of neonatal tetanus infections and many cases of neonatal sepsis (WHO 1991)	Prevent many cases of neonatal sepsis and tetanus	WHO 1998
Early initiation of Breastfeeding, exclusive breastfeeding	Reduce vitamin K deficiency	Puckett, 2000
Congenital abnormalities: Neural tube defects	Preventable by preconception folic acid	Lancet, 1991, Save the children 2000
Congenital abnormalities: Cretinism	Preventable by adequate maternal iodine intake	Lancet, 1991, Save the children 2000
Congenital rubella syndrome disabilities	Preventable by rubella immunization	Lancet, 1991

It appeared from the present review that the following **Institutions** have been successfully implementing newborn health programs in South Asia:

- The Integrated Management of Childhood Illness (IMCI) program in Bangladesh and Pakistan;
- Institutional deliveries and integrated maternal and child health care program in Sri Lanka;
- Dinajpur Safe Mother Initiative in Bangladesh [implemented by GOB, CARE and UNICEF];
- Community-based Interventions in the care of Low Birth Weight (LBW) babies carried out in Haryana, India;
- Bangladesh Integrated Nutrition Program (BINP) [implemented by GOB, the World Bank, UNICEF and other organizations];
- Home-based Newborn Care Package program in Maharastra, India [by SEARCH, an NGO];
- Newborn care practices in the home and pre-testing of alternative behaviours in Sylhet, Bangladesh [implemented by ICDDR,B, Johns Hopkins University and Shemantik];
- Saving Newborn live Initiatives, Save the Children, USA [by SNL-Dhaka)
- Clinic and Community approach to Maternal and Child Health in Calcutta, India [by the Child in Need Institute (CINI)];
- National Newborn Resuscitation Training Program in Pakistan [by the neonatal group of the Pakistan Pediatrics Association];
- Social Marketing of Clean Delivery Kits in Nepal [by PATH, UNICEF, and Save The Children (USA)];
- TBA Training in Nepal with a view to keep the newborn warm;
- Training on Essential Newborn Care [by the College of Physicians and Surgeons of Pakistan and the Aga Khan University Medical Center, Pakistan; the Institute of Mother and Child Health, Bangladesh].

In addition to the above findings, the present review identified the following gaps in knowledge and understanding:

There is a need to focus on both the mother and the baby

Newborn health cannot be separated from the health and health care of women of reproductive age (Belsey 1992). Although the immediate medical causes of maternal and perinatal deaths differ, the underlying causes of these deaths are very similar. Many of the conditions that result in complications for the mother during pregnancy, delivery, and after delivery also result in complications for the baby. So the health of newborns must be considered with that of their mothers, who also face significant risks during and in the days following delivery (PRB 2003).

Need for a systematic community-based approach for the newborn

Since most newborns die at home during the first week of life without any contact with a skilled birth attendant, a systematic approach in the community is critical. One of the community approaches on safe mother initiative (Hossain and Ross 2001) show positive results but others are in the process of implementation. For effective programming, a systematic approach is critical. ICDDR,B is testing integrated approach to improving newborn care by adapting to local needs. In India, a home-based approach to care has resulted in a dramatic reduction in newborn deaths.

Steps need to be taken to reduce the birth of LBW babies

In Bangladesh community based nutrition program component shows improvements in knowledge on some health and nutrition related behavior but little effect on the practice of exclusive breast-feeding, or on the nutritional status of pregnant and lactating women. A small clinic in India organized women groups and provided support to poverty-stricken families to improve their income and functional literacy. The project reduced LBW by one-third, more women have been identified early in their pregnancy and have been registered at the clinic and attended deliveries have increased.

Presence of skilled/ trained birth attendants need to be ensured for all deliveries

The presence of a skilled birth attendant at delivery is associated with lower maternal deaths and newborn deaths (WHO 1996, DeBrouwere et al. 1998). Its maximal influence is in reduction of deaths during the first 24 hours after birth, which represents about 40 percent of all neonatal deaths. Unfortunately except Sri Lanka, the goal of providing skilled birth attendants for all deliveries in South Asia region remains years, even decades away. In Sri Lanka, a high proportion of skilled birth attendance could only be achieved over a 75-year period. Many women in the region continue to follow traditional practices during pregnancy and childbirth, often seeking care from traditional birth attendants (TBAs). Although their role in maternal and newborn care is controversial, it is apparent that TBAs remain a critical link for community-based efforts to improve newborn health in South Asia region. Efforts are needed to find ways to make available a skilled birth attendant in the community or to improve the potential role of TBAs in improving maternal and newborn health and in reducing neonatal mortality.

There is a strong need for advocacy policies to address newborn care

Although most of the countries have Safe Motherhood and Child survival policies, very few have specific policies addressing newborn care. Many policy maker and program managers are unaware or misinformed about newborn care. It is important to build constituencies that support neonatal effort at various levels. For example, in Bangladesh 'the strategy of mainstreaming and partnerships' helped the stakeholder to understand the magnitude of the problem. Government has included neonatal care as an integral component of essential service delivery.

There are many interventions that are effective for reducing both maternal and neonatal mortality but these cannot all be implemented at once. Some interventions produced 'clear evidence' and some are still under trial. While the final goal is to establish a complete system with all of the key services and interventions working well, this must be achieved gradually. It is important to start with the interventions that will have the greatest effect on newborn (and maternal) survival locally, but they should also be the most feasible.

The priorities may vary from one setting to another. It is also necessary to select the key interventions that will have the greatest impact on the problem in the local setting. It should be cost-effective, feasible and sustainable, and acceptable to the community.

Maternal and fetal neonatal health problems are complex. They arise from a combination of social, cultural, environmental, and medical conditions that perpetuate the situation. The responsibility for solving this problem lies with local health professionals, communities, households, and mothers themselves. Thus creating partnership will be a key strategy for implementation of interventions.

Based on the best practices for essential newborn care, the following intervention strategy may be undertaken as a package (broadly comprising community empowerment, promotion of healthy behavior, and strengthening professional/ institutional capabilities):

Community may be empowered

- To increase the status of the newborn (including LBW newborn) in the community
- To carry out essential newborn care for normal babies
- To reduce delays in access to emergency care for mothers and newborns
- Introduce social marketing of clean delivery
- Improve transport options for emergency care

May promote healthy behaviors

- Promote early, exclusive breastfeeding
- Increase knowledge of danger signs for the newborn
- Address harmful practices
- Increase knowledge to identify the LBW baby and associated danger sign

- Address harmful practices that affect the newborn

Building capable professional/institution

- Access to skilled attendant at birth
- Ensure home care of mother and newborn
- Skilled attendant with neonatal resuscitation
- Skilled attendant with capability to take rectal temperature
- Provide routine immunization
- Access to emergency newborn care
- Provide logistic support for supply of drugs and basic equipment for emergency newborn care

Limitations

The present review study had some obvious limitations:

- Given the limited time for review, it could not conduct an exhaustive review of all relevant documents; and,
- Lack of access to the original documents of projects/ programs in countries outside Bangladesh.

In view of the above limitations, the conclusions and recommendations of the review study should be taken with caution. Such limitations could be avoided if the study duration was longer and if there was provision to undertake field trips to the newborn care programs/ projects in different Asian countries. A future study in this direction might overcome these limitations.

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United Nations Children's Fund
Regional Office for South Asia
P. O. Box 5815
Lekhnath Marg
Kathmandu, Nepal

Telephone: 977-1-4417082
Facsimile 977-1-4418466 / 4419479
www.unicef.org