NATIONAL NEONATAL HEALTH STRATEGY AND GUIDELINES FOR BANGLADESH

March 2009

Ministry of Health and Family Welfare
Government of the Peoples' Republic of Bangladesh

National Neonatal Health Strategy and Guidelines for Bangladesh

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National Neonatal Health Strategy & Guidelines

Advisory Board
National Core Committee for Neonatal Health (NCC-NH)
Ministry of Health & Family Welfare

Published by
Ministry of Health & Family Welfare

Technical Contribution
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Supported by
UNICEF, WHO, SNL- Save The Children USA, ICDDR,B

This publication was printed with technical and financial support from UNICEF, Bangladesh

Foreword

Advisor
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Bangladesh has made sustained and remarkable progress in many areas of child as well as maternal health. During the last decade, under-five mortality has decreased more than we expected and Bangladesh is currently one of the few developing countries which are on track to achieve MDG 4 by 2015.

Over the last few years, there have been very rapid reductions in mortality, especially among children aged over one month, however very slow pace of reduction in neonatal deaths may hinder our progress to achieve MDG 4.

The present government is committed to ensuring basic health care services to all population, particularly to the women and children. One of the major objectives of the Health, Nutrition & Population Sector Programme (HNPSP, 2006-11) is to reduce maternal and under-five mortality with provision of essential services for the mother and child. However, there still exists gross disparity in terms of equity for maternal, neonatal and child health services which need broader and continued attention.

To that end, I am delighted to know that Ministry of Health & Family welfare has formulated this National Neonatal Health Strategy & Guidelines, which will guide our policy makers, planners and programme people to take appropriate interventions that need to be scaled up rapidly with high coverage to address high burden of neonatal morbidity and mortality in our country.

I congratulate everyone who was involved directly or indirectly in developing this very important strategy document, and highly appreciate their commitment and engagement in this endeavour. I also thank all our development partners for their continued support in this initiative of MOH&FW.

I assure our government's commitment to implement this strategy within the shortest possible time. I believe that with our collective efforts we will be able to sustain our achievements and reach our goal of achieving MDG targets.

Foreword

Minister
Ministry of health and Family Welfare
Government of the people's Republic of Bangladesh

Bangladesh has made significant progress in reducing under-five mortality in recent years and is currently on track to achieve Millennium Development Goal-4 even before 2015. The country has been able to maintain it's success in several child survival indicators, for example, immunization, use of ORT for diarrhoea, Vitamin A supplementation, iodized salt consumption etc. Notwithstanding these successes, a very slow pace of reduction in neonatal mortality rate still posses the greatest threat in maintaining the progress towards achieving MDG 4 targets as neonatal deaths now contribute nearly two-thirds of infant & more than half of under-five deaths in Bangladesh.

Despite various efforts being under taken within the framework of the Health Nutrition and Population Sector Programme (2006-11), we could not yet ensure essential life saving services to all the population in need, particularly for mothers and children. It is now imperative to take the dyad of essential maternal & newborn health care to the population in a manner that ensures good quality and promotes high population coverage

The present government has placed maternal and child health at the top of its public and political agenda and is firmly committed to reducing both maternal and under-five child mortality with a clear set of targets and timeline. We are revitalizing community clinics as well as taking affirmative actions to ensure essential services to every mother and newborn in way that all those who need these services are able and do use these services. I am, therefore, delighted to learn that the Ministry of Health and Family Welfare has formulated the National Neonatal Health Strategy and Technical Guidelines for Bangladesh. I congratulate the numerous national and international experts who worked for more than a year with all their wisdom and expertise, taking account of all available evidence and lessons from Bangladesh and other countries, and developed this very important document for us, which encompasses both strategic directions and guidelines for implementation. I strongly believe that this document will steer our policy makers, planners and managers in shaping the programme for maternal and neonatal health for the next few years. I am convinced that this will provide us with the capacity and guidance to reach each and every pregnant mother, her newborn and her family at home with essential services.

I am pleased to observe that our development partners have come forward as they have always done, in supporting the government's endeavour to improve the lives of the mothers and children of Bangladesh. We strongly feel that the full implementation of the recommendations as envisaged in the national neonatal heath strategy and technical guidelines will need strong partnerships between the government, development partners, national and international agencies to translate this strategy in to actions. On behalf of the Ministry of Health & Family Welfare I affirm our commitment towards the implementation of this strategy.

Prof. Dr. Ruhul Haque

August 2009

Foreword

State Minister
Ministry of health and Family Welfare
Government of the people's Republic of Bangladesh

Bangladesh has made great stride in child survival over the last few decades. Under-five mortality rate declined from…?. to 65 per 1000 live births while neonatal deaths reduced to 37 per 1000 live births in 2007. Globally the country is one of the seven countries on track to achieve Millennium Development Goal (MDG) 4 for a reduction in child mortality by two-thirds by 2015.

Despite this remarkable progress in reducing child mortality, slow pace of reduction in neonatal mortality may hinder achieving MDG target within the stipulated time. About 57% of all under-five child deaths occur during the first 4 weeks of life, and a further 23% between one and twelve months of age. If the current trend continues, it will be a challenge for Bangladesh to achieve MDG 4.

Newborn health is inextricably linked to maternal health condition, thus any intervention for improving neonatal health should be designed along the continuum of care approach of addressing equally the healthcare & well being of pregnant women, mother, newborn and child. There also exists gross disparity in terms of service utilization between the poorest and richest population.

MOH&FW have been implementing various programme for improving the maternal, neonatal and child health within the overall framework of HNPSP. The present democratic government has put much impetus on improving the maternal and neonatal health by extending the availability of essential services to the doorsteps of every population, particularly the poorest and under-privileged. To that end, the MOH&FW has reopened community clinic for every 6000 people in order to make them functional with provision of basic & essential maternal, neonatal health services at the vicinity of the community.

I am pleased to know that Ministry of Health & Family welfare is going to publish the National Neonatal Health Strategy & Guidelines, which was developed through a very consultative process involving different stakeholders. I congratulate everyone including the development partners and other partner agencies for their contribution to develop this strategy document, which will guide our policy makers and programme people in implementing appropriate interventions for maternal and neonatal health in this country.

Let us work together to translate this strategy document into action which will enable us to achieve our desired objectives of achieving MDG 4 & 5 targets by 2015.

sm

August 2009

Foreword

Secretary
Ministry of Health and Family Welfare
Govt. of the People's republic of Bangladesh

Bangladesh has made noteworthy progress in child survival during the last decade with under-five mortality rate declining to 65 per 1000 live births in 2004 from 133 deaths per 1000 live births in 1991. Bangladesh is thus well on track to achieve the Millennium Development Goal-4.

The one discouraging note in this success story is the slow progress in improving neonatal survival in Bangladesh which still remains unacceptably high at 37 per 1000 live births. Despite various programmes being undertaken by both DGHS and DGFP as part of the Health, Nutrition and Population Sector Plan, 2006-11, essential newborn care did not receive much attention and effort in the package of services under essential service delivery. Almost two-thirds of the newborns who die do so within 7 days of birth, more than 50% within 24 hours and almost all of them at home. This requires that we focus on strengthening community-based essential maternal and neonatal care services. We now have in-country evidence of high impact and cost-effective community-based neonatal care services which can reduce neonatal morbidity and mortality from common causes.

To this end, the Ministry of Health and Family Welfare stewarded the formulation of the National Neonatal Health Strategy and Technical Guidelines for Bangladesh. This strategy is comprehensive and unique as it identifies both strategic approaches as well as intervention packages, and also provides standard technical guidelines for their implementation. I believe this strategy document will offer the much needed direction and guidance for improved service provision for the newborns.

I understand that the strategy and guidelines has been developed through a very consultative process involving experts, academicians, professionals, programme managers, service providers from both the public and private sector, as well as civil society and beneficiaries. I congratulate and express my heartfelt thanks to all of them who worked relentlessly and made this strategy happen. I also extend my gratitude to all our development partners and other agencies who supported this initiative of the government in an exceptional way.

I am confident that the neonatal health strategy and technical guidelines will guide us in the planning and implementing appropriate interventions to reduce neonatal morbidity and mortality in our country which will go a long way in sustaining our progress towards achieving MDG 4.

Acknowledgement

Joint secretary (WHO and PH)
Ministry of Health and Family Welfare
Govt. of the People's republic of Bangladesh
And Chairmen, National Core Committee for Neonatal Health

Interventions being delivered by the Child Health and IMCI Programmes of the Government mainly target children beyond the first month of life These interventions have contributed considerably to rapid improvements in child survival in recent years. However, since more than half of child deaths now occur in the first month of life, I suspect that it will maintain this pace of mortality reduction with only existing interventions that mostly target older children. It is now imperative that increase our focus on neonatal health and address health care needs that are usually over-looked in current maternal and child health programmes.

Under the guidance of National Core Committee for Neonatal Health of the Ministry of Health and Family Welfare, six Technical Sub-committees comprising more than 70 professionals, academicians, programme managers, national and international experts from partner agencies have relentlessly worked for more than one year to develop the National Neonatal Health Strategy and Technical Guidelines. This was reviewed in several consultative workshops at divisional and national levels involving different stakeholders including civil society and beneficiaries. The strategy was finalized after seeking public opinion through our website. I congratulate everyone who has been part of this endeavour.

I express my gratitude to our development partners, particularly UNICEF, WHO, UNFPA, Saving Newborn Lives (SNL) Initiative of Save the Children-USA, and ICDDR,B, as well as other national and international institutions and agencies who supported the development of the strategy and helped made it happen. I believe that this document would be recognized as a milestone in our efforts to improve neonatal health in the country, and hope it will lead as well as guide the government and non-governmental partners in harmonizing efforts for improving neonatal health in Bangladesh. Our special thanks to UNICEF Bangladesh for their technical and financial support in publishing this strategy document.

Now we need to develop a national action plan so that this strategy does not just remain a document but is translated into plans and actions that can be monitored. I believe that our collective efforts and shared responsibility will help us to achieve our desired objectives.

Dr. Anwar Hossain Munshi August 2009

Message

Director General
Directorate General of Health Services
Ministry of Health and Family Welfare
Govt. of the People's Republic of Bangladesh

Bangladesh has made remarkable gains in ensuring that all Bangladeshi children can survive and grow to their full potential. Recent national surveys show that under-five mortality has declined by more than 25% over just a span of 3 years, and by over 50% in 14 years. Very few countries in world have demonstrated more rapid progress than Bangladesh.

A consequence of this impressive progress is that currently deaths in the first month of life, i.e., neonatal mortality, now comprise almost 60% of total under-5 child deaths and more than 70% of infant deaths. The implications of this is that if we are to sustain the rapid progress towards MDG4 goals, we have to accelerate reductions in neonatal mortality. This will be a challenge as our existing programmes have not managed to significantly reduce neonatal mortality. Thus, there is a need to adopt feasible strategic approaches, as envisaged in this strategy document, to incorporate and/or strengthen neonatal components in existing programmes and to mainstream neonatal health in the health sector plan.

I thank the Ministry of Health and Family Welfare, particularly Honourable Minister, Ministry of Health and Family Welfare, for approving the National Neonatal Health Strategy and Technical Guidelines. I acknowledge the contribution of the large numbers of experts, policy makers, programme managers and stakeholders in formulating this strategy in a very consultative process. I congratulate the members of Technical Sub-committees and the National Core Committee for successfully guiding the entire process for over a year. Those who participated and provided valuable input into the strategy through the divisional and national stakeholder's consultation workshops and through our website deserve special appreciatiation as their valuable suggestions and feedback enriched the strategy and the technical guidelines.

I hope our collective efforts will enable us to translate the recommendations of this strategy in to reality in reducing neonatal morbidity and mortality.

Professor Dr. Shah Monir Hossain

August 2009

Message

Director General
Directorate General of Family Planning
Ministry of Health and Family Welfare
Govt. of the People's Republic of Bangladesh

The Directorate General of Family Planning have been at the forefront of implementating programmes that provide care for the new mother, during and after pregnancy and during delivery. I am, therefore, delighted that the Ministry of Health and Family Welfare has formulated this National Neonatal Strategy and Technical Guidelines since the neonate is part of a truly inseparable duo of mother and neonate, and the strategy and guidelines will help us provide even better and more comprehensive care to the mother and her newborn.

In the global context where more than 500,000 women die from pregnancy-related causes and 4 million newborns die before their first month of life each year, this strategy will allow us to build on experiences and evidences to strengthen efforts for implementing essential maternal and newborn health interventions at scale. The Ministry of Health and Family Welfare, in conjunction with partners, has been continuously strived to advocate for integrated and collaborative efforts for improving the health of women and newborns. This document also assembles essential technical guidelines for maternal and neonatal actions which will assist us in providing care and services during pregnancy, child birth and after delivery care for the improvement of neonatal health. Our directorate and staffs affirm our commitment to the successful implementation of this strategy.

I will be remiss in my duty if I did not acknowledge the effort of all experts, researchers, clinicians and policy makers and programme managers in developing this strategy and guidelines. I congratulate the team for their sincere contribution and hope that this document will help everyone in planning and implementing appropriate interventions directed towards the improvement of maternal and neonatal health in Bangladesh.

At the end I wish its successful implementation across the country in all sectors including non-governmental and private, and help Bangladesh on its road towards the UN Millennium Development Goals 4 and 5. I am confident that the government, along with its development partners, will be able to bring a meaningful change in neonatal survival in the coming days.

List of Acronyms

ACCESS	Access to Clinical & Community Maternal, Neonatal & Women's Health Services
AHI	Assistant Health Inspector
AMTSL	Active Management of Third Stage of Labour
ANC	Antenatal Care
APR	Annual Programme Review
ARI	Acute Respiratory Infection
BCC	Behavior Change Communication
BDHS	Bangladesh Demographic and Health Survey
BEmONC	Basic Emergency Obstetric & Newborn Care
BNEP	Birth, Neonatal and Emergency Preparedness
BP	Blood Pressure
BPP	Birth Preparedness Package
BRAC	Bangladesh Rural Advancement Committee
CBO	Community-based Organization
CDNK	Clean Delivery & Neonatal Kit
CEmONC	Comprehensive Emergency Obstetric & Newborn Care
CHW	Community Health Worker
C-IMCI	Community Based Integrated Management of Childhood Illness
C-IMNCI	Community Based Integrated Management of Neonatal and Childhood Illness
CME	Continued Medical Education
CNO	Community Nutrition Organizer
CNP	Community Nutrition Promoter
CSBA	Community-based Skilled Birth Attendant
DALY	Disability Adjusted Life Year
DGFP	Director General of Family Planning
DGHS	Director General of Health Services
DH	District Hospital
DSF	Demand Side Financing
EmOC	Emergency Obstetric Care

ENC	Essential Newborn Care
EPI	Expanded Program for Immunization
FPI	Family Planning Inspector
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
FWVTI	Family Welfare Visitor Training Institute
GoB	Government of Bangladesh
GYN	Gynaecology
HA	Health Assistant
HEB	Health Education Bureau
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HNPSP	Health, Nutrition, and Population Sector Programme
IEM	Information Education and Motivation
IMCI	Integrated Management of Childhood Illness
IMR	Infant Mortality Rate
INGO	International Non-government Organization
ITN	Insecticide Treated Net
IUGR	Intrauterine Growth Retardation
IYCF	Infant and Young Child Feeding
JiVitA	A Health & Nutrition Research Project of the JHU
KMC	Kangaroo Mother Care
LBW	Low Birth Weight
MA	Medical Assistant
MCH	Maternal and Child Health
MCWC	Maternal and Child Welfare Center
MDG	Millennium Development Goal
MHV	Maternal Health Voucher
MICU	Maternal Intensive Care Unit
MIS	Management Information System
MMR	Maternal Mortality Ratio
MNH	Maternal and Neonatal Health
MOHFW	Ministry of Health and Family Welfare
NB	Newborn
NCC-NH	National Core Committee for Neonatal Health
NGO	Non-government Organization
NICU	Neonatal Intensive Care Unit
NMR	Neonatal Mortality Rate
NNP	National Nutrition Program
NPO	Nothing Per Oral
OGSB	Obstetrical and Gynecological Society of Bangladesh
PNC	Postnatal Care
PO	Project Officer
PPTCT	Prevention of Parent to Child transmission
PRSP	Poverty Reduction Strategy Paper
PSBI	Possible Severe Bacterial Infection
RR	Respiratory Rate
SACMO	Sub-Assistant Community Medical Officer
SCF	Save the Children Fund
SK	Shasthya Kormi (Health Worker)
SNL	Saving Newborn Lives
SOP	Standard Operating Procedure
SS	Shasthya Sebika
SSN	Senior Staff Nurse
STI	Sexually Transmitted Infection
TB	Tuberculosis
TBA	Traditional Birth Attendant
TT	Tetanus Toxoid
TTBA	Trained Traditional Birth Attendant
UH&FWC	Union Health and Family Welfare Center
UHC	Upazila Health Complex
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

Introduction

BANGLADESH, a country of more than 140 million people, has made considerable progress in the health sector, particularly in child health, in recent decades. Since 2003, the Ministry of Health and Family Welfare (MOHFW), with support of development partners, has been implementing a sector-wide Health, Nutrition, and Population Sector Programme (HNPSP). The HNPSP 2003-2011 is designed to strengthen the country's health sector and accelerate progress towards reaching the National Strategy for Poverty Reduction (PRSP) goals and health related Millennium Development Goals (MDGs). The recent (March, 2008) Midterm Review of HNPSP mentions that "MDG targets seem well on track, but areas of concern remain particularly with regards to maternal and neonatal care, where progress is too slow".

Two major independent evaluations[1,2] of HNPSP, including MTR, identified critical gaps in maternal, neonatal and child health and suggested strengthening relevant services to accelerate progress towards achieving the MDGs. The evaluations recommended that special attention be given to informing mothers and ensuring availability of skilled workers during pregnancy, childbirth and postnatal period, with special emphasis on neonatal outcomes. Given the fact that a National Maternal Health Strategy with very limited focus on neonatal health exists, the Government and its partners crucially need strategy and guidelines for neonatal health to help support its efforts to achieve the MDGs 4 and 5.

This strategy paper is the result of intensive discussions of five technical working groups, under the National Core Committee, of MOHFW, and consultations at sub national and national levels. It represents a synthesis based on situation analysis, review of documents, and selection of evidence based interventions. It further proposes strategic directions and priorities for the Government to consider for improving maternal and neonatal health at all levels of service delivery.

The document is organized into two main sections.

Section I: National Neonatal Health Strategy: provides overall context, goal and objectives and key issues to be addressed. It also includes descriptions of critical intervention areas following the continuum of care from pre-pregnancy through postpartum care.

Section II: Guidelines for National Neonatal Health Strategy: This section consists of a series of tables and flow charts that provide overview of interventions, summary by continuum of care, detail guidelines for the interventions, human resources for different service levels, information on logistics supply and details on supervision, monitoring and evaluation. It also includes some annexes that narrate information and tables related to the strategy. A broad based Action Plan for the Strategy is also included as annex.

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Section I

National Neonatal Health Strategy

1 Background

1.1 Global Context

The four million neonatal deaths that occur annually account for two-thirds of all infant deaths and two-fifths of all under-5 deaths.[3] Most neonatal deaths take place in developing countries, at home, and in the absence of skilled care. In many developing countries, neonatal mortality now accounts for over a third of all child deaths, with about three quarters occurring in the first week of life. It has been estimated that one quarter of these deaths could be saved with universal coverage of initiation of breastfeeding within 1st hour.[4]

The Lancet series on neonatal health reported that "the distribution of direct causes of death indicate that preterm birth (28%), severe infections (36%, including sepsis/pneumonia [26%], tetanus [7%], and diarrhoea [3%]), and complications of asphyxia (23%) account for most neonatal deaths.[5] Globally about 14% of all live births are of low birth weight (LBW), of which (28%) are preterm. LBW is an important indirect cause of neonatal death and accounts for 60% to 80% of neonatal deaths. According to the WHO estimates,[6] birth asphyxia accounts for 29% of global neonatal deaths. Almost the same number develops severe neuro-developmental consequences.[7]

As with any health problem, there is a societal cost for high maternal and neonatal morbidity and mortality. This cost is often compared using 'disability adjusted life years' (DALY) lost, and estimating the cost for avoiding this loss. The Lancet series provides an analysis of the costs for a variety of maternal and neonatal interventions based on DALY averted. An integrated package of interventions is shown to be very cost-effective, costing an estimated $15-47 per DALY averted.[5] Most of these deaths and related disabilities are thought to be preventable through wider implementation of proven effective and affordable interventions, which may be able to prevent up to 72% of these deaths.[3] Hence the for countries to formulate a clear strategy to improve neonatal health.

1.2 Maternal and Neonatal Health Situation in Bangladesh

1.2.1 Trends in Infant and Neonatal Mortality

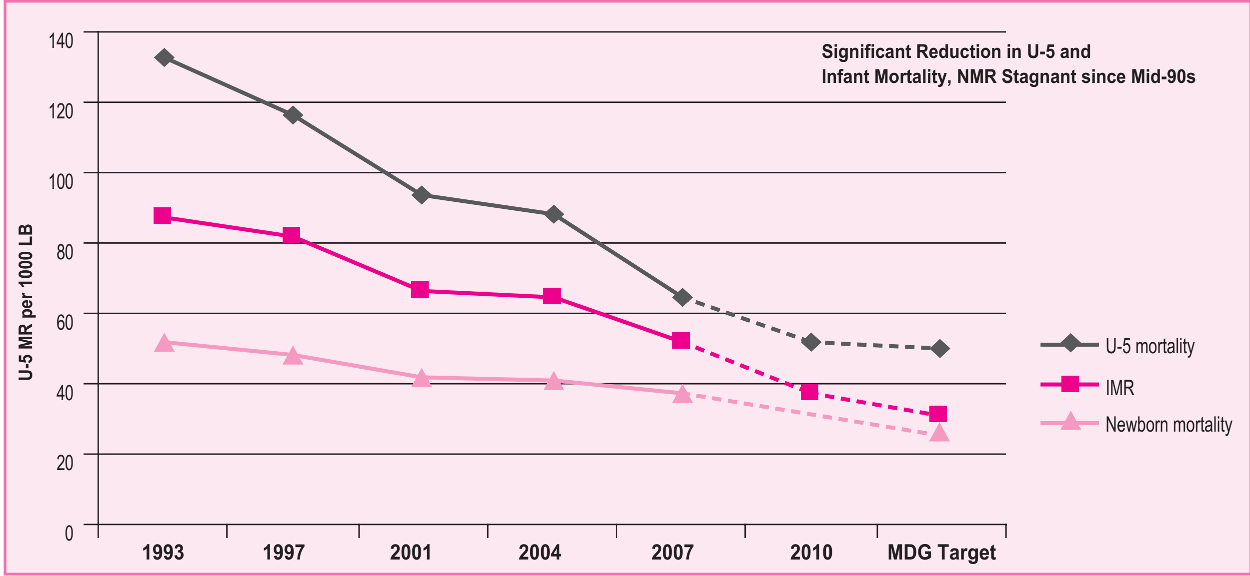
From 1994 to 2007, Bangladesh experienced a dramatic decline in infant and under-5 mortality. Under-5 mortality decreased from 133 to 65, and infant mortality decreased from 87 to 52 deaths per 1000 live births. During the same period, neonatal deaths declined from 52 to 37 deaths per 1000 live births.[8] The slower decrease in neonatal mortality has meant that neonatal deaths represent a higher proportion of overall deaths.

The average annual rate of reduction of mortality was 9.4% per year for death rates in the age-group 1-4 years, 5.8% among 1-11 month old infants and only 2.6% in neonates. The overall rate of reduction of under-5 mortality in this period was 4.9%. It is clear that while reductions in death rates in older children have been rapid the decrease in neonatal mortality has been minimal in recent years. Thus, more than half (57%) of under-five deaths in Bangladesh occur in the neonatal period. Moreover, neonatal mortality contributes 70% of infant or 57% of under five mortality in Bangladesh.

According to the BDHS 2004 report, the main causes of neonatal death in Bangladesh were birth asphyxia (21%), low birth weight (11%) and possible severe infection (34%), and acute respiratory infection (10%)[9] as shown below:

Figure 1: Trend in Under-5, Infant and Neonatal Mortality in Bangladesh

(Source: BDHS 1993-2007)

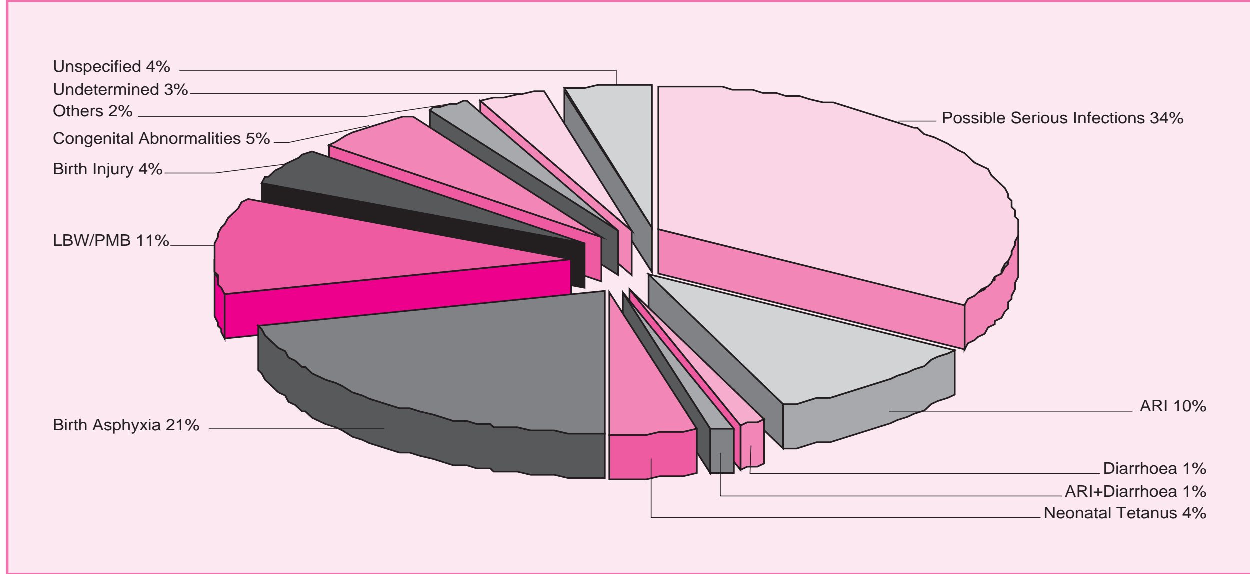


In Bangladesh, data on incidence or prevalence of birth asphyxia are limited. Considering birth asphyxia to cause 21 percent of total neonatal deaths (BDHS 2004), birth asphyxia specific mortality rate can be estimated to be 8.7 deaths per 1000 live births.

The extent of LBW in the country has not been well documented either as most (85%)[6] women deliver at home. Also neonates are not commonly weighed due to lack of established practices for measuring birth weight at home or at the community level. The BBS/UNICEF 2004 countrywide survey[10] revealed that 36% of neonates are LBW.

Infections cause high proportion of neonatal deaths with severe infections contributing to more than a third (34%) of deaths. A number of maternal and early post-natal factors contribute to the risk of neonatal infection.

Figure 2: Causes of Neonatal Deaths (BDHS 2004)



1.2.2 Breastfeeding and Neonatal Mortality

Evidences show that early initiation and exclusive breast feeding for six months have positive impact on neonatal health and survival. A study in Bangladesh found that poor breastfeeding practice contributes significantly to neonatal deaths.[11] Though, over 90% of Bangladeshi mothers continue breastfeeding their infants at 20-23 months of life, exclusive breastfeeding less than 6 months of age is only 43% while initiation in the1st hour of life is only 36% (MICS 2007).

Breastfeeding - the Cornerstone for Newborn Survival and Health

Evidence shows,[15,16] universal initiation of breastfeeding within first hour of life reduces neonatal mortality by 31% and also there is causal association between early breastfeeding and reduced infection-specific neonatal mortality[17]. Early breastfeeding initiation is an effective, feasible, low-cost intervention that can reduce early infant mortality in LBW infants in developing countries.[18]

Universal initiation of breastfeeding within an hour of birth has been estimated[19] to save 37,000 newborn lives and 52,000 under-5 lives and thus reduce under-5 mortality rate by over 20%.

A newborn's pre-breastfeeding behaviour such as sucking and licking have been documented[20] to increase maternal oxytocin release with subsequent early milk let down, uterine contraction and placenta expulsion and improved maternal-newborn bonding. A recent Cochrane review[21] found skin-to-skin contact (SSC) of newborns with their mothers to benefit breastfeeding outcomes, early mother-infant attachment, infant crying and cardio-respiratory stability, and no apparent short or long-term negative effects.

1.2.3 Maternal Health Linked to Neonatal Outcomes

In Bangladesh, Maternal Mortality Ratio (MMR) is high (290/100,000 live births) with two women dieing every hour due to pregnancy and childbirth related complications.[12] It is estimated that for each maternal death, fourteen perinatal deaths occur while three fourths of the babies born to women who die, also die within the first year of life.[13]

The 2007 BDHS showed that 52 % of pregnant women received at least one antenatal care (ANC) from a medically trained provider while only 18% of births were attended by medically trained providers and less than 15% took place at health facilities. However only 21% of mothers and 22% of neonates received postnatal care (PNC) from a medically trained provider within 42 days after birth.[14]

Equity in maternal care is a significant issue that deserves special attention and has serious implications for newborn health. The BDHS 2007 data on antenatal care, skilled attendance at birth, and postnatal care strongly indicates gross disparity in service coverage for different economic quintiles.

These figures suggest significant gaps in care to mothers with serious implications for neonatal outcomes. To further reduce child mortality and achieve the Bangladesh Millennium Development Goal-4 for child survival, a strengthened and integrated approach is needed for maternal and neonatal health.

1.3 Policy and Strategy Background

The constitutional commitment of the Government of Bangladesh is to provide basic health services to all people in the society. The Constitution states that "health is the basic right of every citizen of the Republic," as health is fundamental to human development.

The cornerstone of national health sector program policy, the Health, Nutrition and Population Sector Program (HNPSP) was formulated in 2003. HNPSP prioritized ensuring universal accessibility and equity in healthcare with

particular attention to the rural population. MCH and reproductive health have already been emphasized in the HNPSP and neonatal health has recently become a priority concern. The package of essential services has been strengthened for delivering from static service points as well as domiciliary visits by community health workers.

HNPSP is implemented under the strong stewardship of MOHFW with its major directorates- DGHS, DGFP, and NNP. Functionally, health and family planning personnel work closely at upazila, union and outreach levels but their line management remains separate at all levels. Educational support to national health programs is provided by the Bureau of Health Education (HEB) and Information Education and Motivation (IEM) unit. UN organizations especially WHO, UNICEF and UNFPA provide financial and technical support to the Government for implementing various key programs, including maternal, neonatal & Child Health initiatives. Saving Newborn Lives (SNL) of Save the Children Fund (SCF), ICDDR,B and other NGOs have made contributions by creating awareness and generating evidence in support of neonatal programs. In recent years emphasis has been given to partnership, collaboration and coordination with development partners and NGOs for wider coverage.

1.3.1 HNPSP and PRSP Priorities

HNPSP has particular focus on services geared towards the achievement of the four PRSP social development goals and targets that are within the mandate of the MOHFW and contribute directly to Millennium Development Goals (MDGs). These are:

- Reducing infant and under-five mortality rates by 65%, and eliminating gender disparity in child mortality
- Reducing the proportion of malnourished children under five by 50% and eliminating the gender disparity in child malnutrition
- Reducing the maternal mortality rate by 75%, and ensuring access to reproductive health services to all (PRSP March 2003)

HNPSP is also committed to reduction of TB and Malaria burden and prevention and control of HIV/AIDS as these also contribute to reducing child mortality and achieving the relevant MDG by 2015. .

1.3.2 Maternal and Neonatal Health Services

Current Government service delivery includes comprehensive emergency obstetric services at most district hospitals and some upazila facilities, and obstetric first aid at the union level. The Government is keen to expand emergency obstetric care (EmOC), community-based SBA training, IMCI and other programs to improve maternal and neonatal health services at all levels. Community services are provided through planned outreach activities and home visits. Community Clinics have been established in parts of the country, as one-stop service center. MOHFW is also piloting demand-side financing in the form of maternal health voucher scheme in 33 upazilas to increase poor women's' utilization of quality MNH services. The IYCF and Baby Friendly Hospital Initiative (BFHI) of the govt. will also contribute significantly in improving maternal and neonatal health.

The National Nutrition Program has extensive community-based activities in selected upazilas. Services like breastfeeding promotion, nutrition education and growth monitoring and selected maternal care services are provided by CNPs through household visits and area based community nutrition centers. However room for improvement remain in terms of quality of counselling on breastfeeding techniques.

NGOs and private sector have their own service delivery systems for maternal and neonatal care through facility and community based services. The NGO static clinics located at union, upazila and district levels throughout the country, deliver primary health care and limited outpatient services. Some also provide safe delivery and emergency obstetric services and other community services. The number of clinics and service delivery points are increasing rapidly in the private sector, utilizing both allopathic and alternative medicines. This calls for strengthening regulatory mechanisms by the government.

There are significant limitations both in staffing and availability of maternal and neonatal service providers, particularly at the community level. Moreover the current voucher scheme does not cover full range of neonatal services.

1.3.3 Health Care Providers for Maternal and Neonatal care

There are different categories of health care providers under the Directorate General of Health Services (DGHS) and Directorate General of Family Planning (DGFP) who provide maternal and neonatal care services. Doctors, Specialists, Medical Assistants (MA), Sub-Assistant Community Medical Officers (SACMO), Senior Staff Nurse (SSN), and Family Welfare Visitors (FWVs) provide facility[2] based curative maternal and neonatal health services at various levels. Scope and quality of services vary with the level and capacity of different facilities.

At the community level, trained Community-based Skilled Birth Attendants (CSBA) provide ANC, safe delivery, PNC, newborn care, breastfeeding and referral services. Community level GoB workforce includes Health Assistants (under DGHS) and Family Welfare Assistants and Family Welfare Visitors (under DGFP). They provide a variety of maternal, neonatal and child health services through household visits, satellite clinics and EPI outreach centers. In NNP areas Community Nutrition Promoters (CNPs) maintain contacts with pregnant and breastfeeding women and women with children under 2 years old, and adolescent girls at the community level. Most of these services are educational, and to date, there has not been a comprehensive and continuum of care approach to deliver maternal and neonatal interventions at this level.

NGO health workers and volunteers also visit households to provide health education, preventive and curative health services related to neonates. In addition, many village practitioners, private doctors, and a large number of non-formal providers exist at community level who provide care for most of the poor, rural women and their children.

1.4 Need for National Neonatal Health Strategy

At present the HNPSP (2003-2010), Poverty Reduction Strategy Paper (PRSP), National Maternal Health Strategy 2001, Community IMCI strategy 2004, Adolescent Reproductive Health Strategy 2006, Anemia Strategy 2007, IYCF strategy 2007, and the HIV/AIDS strategy 2006-10 are the main guiding policy documents for the government and non-government agencies and institutions to provide services to mother and child. However none provide a comprehensive approach to neonatal health. This was also clearly identified by the annual performance review (APR 2007) and midterm review of HNPSP. Therefore this Strategy document has been developed to provide policy guidance to address this gap.

The Government will use this Strategy as the framework for strengthening neonatal services to reduce neonatal mortality and morbidity. The Strategy provides an overarching framework through which to integrate improvements in maternal and neonatal interventions. The MOHFW will call on multilateral agencies, bilateral donors and other partners to work together in the implementation of this Strategy to ensure efficient resource use to prevent fragmentation and duplication.

There are good opportunities to improve services in facilities, particularly district hospitals and upazila health complexes and expand their services and coverage for neonates. Similarly, outreach services (EPI and satellite clinics) can include services for neonates. The Neonatal Strategy will play central role in guiding this process.

In the context of Bangladesh, community services are critical and must be expanded to cover neonatal health. Skilled care at birth is central to the maternal health strategy and has significant implications for neonatal outcomes. The facts that currently 85% births take place at home, there are insufficient skilled birth attendants in the country and that majority of neonatal deaths occur within first 24 hours, justify the need to identify and train a separate cadre of caregivers for neonates to address this critical gap. The Strategy provides guidance for addressing these community needs.

Therefore, this Neonatal Health Strategy is a well-timed initiative of the MOHFW and will fulfill the acute needs to:

- Define strategies and interventions that should be followed in all public and private sectors for improving neonatal health
- Outline essential services for neonates including maternal care and services during pregnancy, childbirth and after delivery, at all service levels
- Integrate neonatal health services with maternal health strategies and interventions to increase service delivery by skilled providers
- Outline human resource development needs and develop a management plan for improving neonatal health services, integrating this into the national Human Resource policy and strategy
- Provide guidance for mobilization and capacity building at the community level to act as part of health delivery system for mother and neonate
- Define critical issues such as logistics, supervision, monitoring, and evaluation and provide guidelines.

1.5 Strategy and Guideline Development Process

This document has been developed through a process of consensus building at multiple levels. It involved engagement of technical experts from the Government, UN Agencies, INGO and NGO community, institutions, professional bodies, and the private sector. The following table provides major events in the process of developing the Strategy:

Table 1: Milestones in the Strategy Development Process

Time Period	Event
Apr 2007	Formation of National Core Committee for Neonatal Health (NCC-NH)
May 2007	Formation of 5 Technical Subcommittees: Healthy Newborn Care, Maternal Care, Birth Asphyxia, Neonatal Sepsis, Low Birth Weight
Jul 2007	Orientation of Subcommittee Members
Aug 07-Jan 08	Meeting of Technical Subcommittees
Feb 2008	Submission of Recommendations from Technical Sub-committees
May 2008	Formation of Cross-cutting Subcommittee
May-Aug 2008	Meeting of Cross-cutting Subcommittee
Jul 2008	Compilation of Subcommittee Recommendations into Preliminary Draft
Jul 2008	Development of Draft 1 and Dissemination Back to Working Groups for Comments
July-Aug 2008	Incorporation of Comments and Development of Draft 2
Aug 2008	Convening of Consensus-building Sub-national Consultations Workshops at Division Level (Chittagong & Rajshahi)
Sep 2008	Convening of National Consultation Workshop at Dhaka
Oct 2008	Incorporation of Comments and Development of Final Draft
Nov-Dec 2008	Submission for Endorsement of the Strategy by National Core Committee for Neonatal Health (NCC-NH)
Feb 2009	Posted in Website of DGHS for Public Opinion Finalization & Endorsement by the National Core Committee
Mar 2009	Approval by the MOH&FW

2 Vision, Goal and Objectives

The Ministry of Health and Family Welfare is committed to accelerate the progress in achieving MDG 4 and 5 through evidence-based interventions and improve neonatal health in the shortest possible time with the following vision, goal and objectives.

2.1 Vision and Guiding Principles

The vision of this strategy is to guide development of an effective, country driven response to reduce neonatal morbidity and mortality through inter-sectoral coordination, strengthened health systems, scaled-up health interventions and empowered communities.

This Strategy is underpinned by a set of principles that include:

- Health, with access to quality and affordable health care, is a basic human right
- Equity in health care is a foundation for all health systems
- Effectiveness and efficiency is central to realizing optimum benefits from available resources
- Neonatal health is an integral part of the continuum of care from adolescence through pregnancy, childbirth and on to childhood and of continuum of services from home to community to facility.
- Neonatal health is a developmental concern requiring multi-sectoral response
- Sound public health policy and practice should be based on evidence

The National Neonatal Health Strategy also recognizes broader issues that undermine neonatal health, including poverty, marginalization, displacement, other emergency situations, poor governance, socio-political instability, economic underdevelopment, lack of infrastructure (water and sanitation), low educational levels and gender inequality.

2.2 Goal and Objectives

The goal of the National Neonatal Health Strategy 2009 is to contribute to the country's development and progress by reducing neonatal morbidity and mortality through improved policies, services and use of services by mothers before, during, and after pregnancy and at childbirth with special attention to care of neonates. This strategy has been developed for the period 2009-2015 with provision of review after three years.

The objectives are to provide guidance and recommendations to:

- Strengthen service delivery at all levels to improve newborn health, using evidence-based interventions
- Build capacity of health service providers at all levels to deliver quality services to address the major contributors to neonatal death, including birth asphyxia, neonatal sepsis and low birth weight
- Increase awareness among mothers and their families of newborn health issues, to bring about behavior changes that reduce risks to the newborn through coordinated BCC efforts
- Sustain an enabling political and policy environment that integrates maternal, neonatal, and child health interventions across different health programs to ensure consistency and optimal coverage

- Improve overall management of human, physical, financial and information resources appropriately to ensure efficient delivery of neonatal interventions
- Involve communities and civil society to own, oversee and ensure delivery of interventions for improving neonatal health

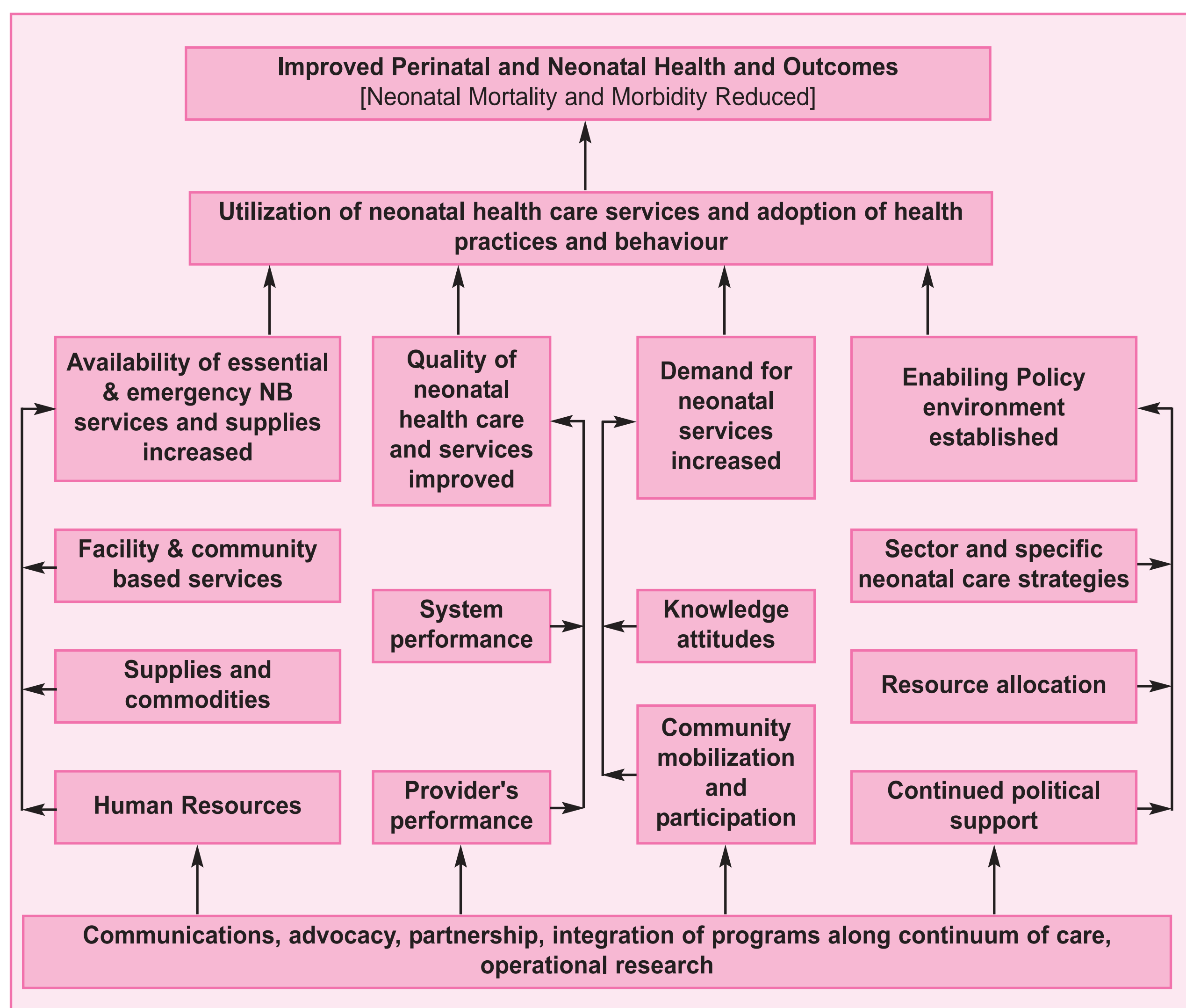
Section I

2.3 Program Theory for the Strategy

The approach of the strategy is based on a program theory that organizes the different activities envisioned to improve maternal and neonatal outcomes and emphasizes need to strengthen the following areas:

- Enabling policy environment with strong political commitment
- Increasing availability of neonatal health services at all levels
- Improving quality of neonatal health services
- Increasing demand for neonatal health services

Diagram 1: Neonatal Strategy Program Theory



3 Strategic Directions

Current demographic and socio-economic changes are likely to increase future demand for quality health care, including a shift towards increased facility use for deliveries and newborn care. Rapid and unplanned urbanization also presents a challenge, with health needs of the urban and peri-urban poor requiring especial attention. The Government services that focus largely on rural care, require to be aligned with the emerging needs.

Within this context, the Strategy will use several approaches to improve maternal and neonatal service delivery and use. The Strategy recognizes the importance of reaching every new mother in the country with adequate information and counseling on appropriate home care and practices for neonatal care. The following sections describe the general directions of this Strategy.

3.1 Prioritize and Improve Home and Community Practices

The Strategy describes activities at the community level to increase awareness of neonatal risks and improve behaviors and service delivery, including:

- Introducing and sustaining best practices for neonatal care by family members (e.g. tetanus immunization, immediate breastfeeding, good hygiene practices, essential newborn care, awareness on neonatal and maternal danger signs, appropriate care-seeking
- Implementing communication strategies to raise awareness among women, family members and community leaders on danger signs and risk factors for neonates, promoting healthy practices, early care seeking and self referral
- Ensuring availability and capacity of community-based workers to increase contact with mothers in the pre- and postnatal periods, including educating mothers and providing essential newborn care
- Strenghten community clinic based maternal & neonatal health services for quality & coverage.
- Scaling up CSBA training under both government and non government sectors to increase coverage for skilled birth attendance, and to improve services to women and neonates during pregnancy, childbirth and the postnatal period
- Introducing community case management for sick neonates including sepsis (e.g. injectable antibiotics for sepsis, mouth to mouth resuscitation).
- Establishing a birth and death registration system

3.2 Strengthen Facility-Based Health Care

The Strategy narrates activities to improve facility-based care, building on the current Maternal Health Strategy and includes:

- Strengthening capacity of managers, service providers and support staff and improving human resource availability at all facilities for provision of care to both pregnant women and neonates; use 'skills and values' based training approach
- Expanding capacity for provision of twenty-four hour MNH services (including manpower and supplies)

- Strengthening referral systems from communities to facilities and between facilities to improve neonatal care; improve facility reception of referred patient
- Increasing coverage of skilled care for every birth including utilization of nurse midwives; initiating pre-service midwifery education, ensuring appropriate attention to neonates, including emergency neonatal care
- Strengthening supervision, monitoring and evaluation of quality of maternal and neonatal care offered by all levels of health workers using a standardized guidelines and evidence based care-practices
- Strengthening capacity of academic institutions to meet specialization and sub-specialization needs in feto-maternal and neonatal care

3.3 Improve Resources, Logistics and Supplies

Neonatal service delivery cannot be improved without attention to logistics supply. The strategy incorporates activities to improve logistics and are:

- Developing detailed procurement lists and equipment specifications for supplies needed for ensuring critical maternal and neonatal services
- Assessing resource needs and improving mobilization of adequate resources for maternal and neonatal health activities
- Improving efficiency of resource utilization for both public and non public sectors to improve coverage and quality of neonatal services
- Strengthening overall logistics supply systems for community and facility service delivery to ensure continuous availability of critical supplies

3.4 Integrate Services for Neonates

Multiple programs and partners have interest in maternal and neonatal health. Integration and coordination between these elements is critical for successful implementation of Neonatal Health Strategy. The following activities are recommended:

- Establishing functional linkages for overall maternal and neonatal services between different programs, including family planning, maternal and child health (including IMCI) and nutrition
- Integrating services under DGHS, DGFP and NNP for essential maternal and neonatal care at home and community levels and in facilities
- Strengthening partnerships, collaboration and integration with NGOs and private sectors to improve coverage and ensure consistent standards of care among skilled and unskilled health workers providing services to mothers and neonates
- Including strong links between community and facility for all new community-based interventions (e.g. management of neonatal sepsis)
- Coordinating policies and technical standards between different related programs, including Maternal Health, EmOC, HIV/AIDS, PPTCT, IYCF, IMCI, CSBA, and other programs that involve services to mothers and neonates

3.5 Innovative Approaches for Neonatal Care

The Strategy envisions new interventions and quality service delivery to contribute to improved neonatal health. Some of these relate to provision of community services, while others reflect new interventions for which research is ongoing. The Strategy accommodates these innovative approaches by:

- Establishing mechanisms for exploring improvement of health systems and adjustments in job responsibilities of different categories of providers to improve coverage and quality of neonatal services
- Including community-based operations research or feasibility studies to improve management of neonatal infections, compliance of KMC at home, low birth weight management, birth asphyxia management at community level etc.
- Allowing for operational testing of interventions as efficacy evidence becomes available (e.g. chlorhexadine for reducing infection; calcium for preventing pre-eclampsia; misoprostol for reducing postpartum hemorrhage)

4 Major Areas of Interest for Neonatal Health

The Strategy addresses five critical areas pertaining to maternal and neonatal health services that need strengthening. For each of these, a set of integrated services need to be provided at each level, as part of continuum of care for mothers and neonates.

The five technical working groups reviewed the current situation for each area and made recommendations for strengthening existing services that were further reviewed by a wider audience during consultation workshops. The selected interventions and approaches for each area are outlined below.

4.1 Maternal Care

Maternal care is critical both for the mother and health and survival of the neonate. Currently maternal mortality is unacceptably high with poor access and low utilization of services. Although ANC rates are improving there are significant limitations in provision of skilled attendance at birth and immediately thereafter i.e during early postnatal period.

The government is committed to improving maternal and neonatal health and supporting the National Maternal Health strategy (2001) within the framework of the HNPSP. The Maternal Health Strategy has a strong focus on antenatal care, safe delivery by skilled birth attendants, and management of complications (EmOC). This Strategy is in line with the Maternal Health Strategy and includes interventions most critical for improving neonatal health. The following maternal interventions are included:

- Strengthening birth, emergency and postnatal care preparedness package
- Improving ANC services and coverage including counseling on breast feeding & full TT immunization
- Increasing use of facilities for normal deliveries and improving EmOC at all levels

- Expanding CSBA training program and establishing a functional system for increasing access and use of CSBAs
- Strengthening postnatal care for both mother and neonates
- Increasing awareness and participation of women, families and communities in improving maternal and neonatal health
- Increasing prevention and management of high-risk diseases including Malaria, TB, STIs and HIV/AIDS

In addition, a number of studies suggest significant improvement in maternal health through new interventions like use of calcium for preventing pre-eclampsia at the community level and use of misoprostol for management of postpartum hemorrhage. As with some new neonatal interventions, the Strategy mentions these as options for further operational research.

4.2 Healthy Newborn Care and Breastfeeding

The neonate undergoes major adjustments at birth to adapt to its new environment, including initiating breathing, regulating body temperature, initiating breastfeeding, establishing digestion and developing the immune system to protect against infection. The prenatal, peri-natal and immediate postnatal periods are thus critical for reducing risks to the neonate undergoing these adjustments. Several interventions have been designed to reduce the risks during these periods.

The Essential Newborn Care Package outlines a series of evidence based preventive interventions proven to reduce neonatal risk and thus improve survival. The package consists of general education on neonatal issues and eight specific interventions:

- Education for clean and safe delivery
- Prevention and management of hypothermia
- Assessment of breathing status (management of birth asphyxia)
- Initiation of breastfeeding immediately after birth (no later than 1 hour) and continuation of exclusive breastfeeding for 6 months
- Appropriate cord care
- Appropriate eye care
- Provision of special care for pre-term and LBW neonates
- Identification, management and referral for complication (including sepsis)

In addition, a recent study in Bangladesh suggests that single dose of oral vitamin A (50,000 IU) given to the neonate shortly after delivery, can reduce infant mortality by 15%.[14] The evidence is pending further guidance from WHO.

A second intervention, use of chlorhexadine for cord care though promising for reducing neonatal infections, is also awaiting final results. The Strategy considers such new evidences as likely interventions pending further operation research or feasibility test.

4.3 Birth Asphyxia

Birth asphyxia, defined[22] as 'failure to initiate and sustain breathing at birth' is associated with various conditions including placental abruption, cord compression, poor placental function from any cause, prematurity, severe meconium aspiration, congenital cardiac or pulmonary anomalies and birth trauma. Twenty-one percent of neonatal deaths in Bangladesh are attributed to birth asphyxia[9]. Seventy percent of neonates with birth asphyxia do not need any resuscitation beyond essential newborn care (ENC).[23]

Given the high numbers of home deliveries, with most still not attended by skilled health workers, interventions for birth asphyxia must include education of mothers and relevant family members as well as improving awareness and skills of all levels of health workers involved with maternal and neonatal care. The Strategy includes the following interventions for reducing the effects of birth asphyxia and its complications:

- Increasing capacity for identification of birth asphyxia among mothers and all levels of health workers
- Strengthening awareness of risk factors and preventive measures to reduce birth asphyxia and its consequences
- increased coverage and quality of antenatal care and identification of high risk cases
- Increasing capacity for early management of birth asphyxia among all levels of health workers present at delivery
- Improving post-resuscitation referral and management

Identification and management of birth asphyxia can be complex depending on the level of service delivery. The Strategy calls for ensuring all health workers to have the capacity for identification and appropriate management of asphyxia as per level of care.

Establishing appropriate management of asphyxia at all levels of health care will require time with measures to be implemented immediately, and at medium and long terms.

4.4 Low Birth Weight

Infants born with low birth weight (less than 2500 gm) are disadvantaged from the very beginning of their lives and have poor survival rates. Since most (85%) deliveries occur at home, the exact prevalence of LBW in Bangladesh is not known. In 2004, the National Low Birth Weight Survey estimated a prevalence of 36%.[10] Prematurity (<37 weeks gestation at birth) and/or intra uterine growth retardation (IUGR) are the two main causes of LBW especially in developing countries.

Major determinants of LBW in developing countries are maternal under nutrition, adolescent pregnancy, acute or chronic infections and malaria during pregnancy in endemic zones.

IUGR and preterm babies have to survive against a spectrum of risk conditions like birth asphyxia/respiratory distress syndrome, hypothermia, hypoglycaemia, septicaemia, hyperbilirubinaemia etc. As such the LBW neonate deserves special attention to prevent and manage the potential complications.

The Strategy provides a series of interventions to improve identification and management of LBW neonates:

- Weighing all neonates at facility and community levels and identifying LBW neonates
- Managing LBW neonates at all levels as per approved guidelines

- Expanding education services for adolescent girls and mothers to reduce risks related to LBW
- Strengthening interventions that directly relate to risk factors for LBW throughout childhood, adolescence and reproductive life of a woman. These include nutrition supplements for high risk mothers, iron and/or folate for adolescent girls and mothers, and screening and management of bacteriuria
- Expanding focused nutritional interventions for vulnerable groups, especially in food insecure areas

4.5 Neonatal Sepsis

Neonatal infections, including 34% of possible serious infections, are a major (about 50%) contributor to neonatal mortality. Since infections in neonates progress rapidly, it is of particular concern in situations where facility delivery is low.

A recent randomized controlled trial in Bangladesh[24] demonstrated one third reduction in neonatal mortality compared to control areas, by introducing home-based identification and management of possible severe neonatal infection by trained CHW. The study provides strong evidence in favour of a series of interventions for averting deaths due to sepsis, which the Strategy has adopted and includes:

- Home visits to increase awareness and promote Essential Newborn Care
- Establishment of birth and death registration system
- Expansion of Community-based IMCI to include the entire neonatal period
- Evaluation of role of all levels of health workers in providing improved maternal and neonatal care-including sepsis management
- Strengthening link between maternal health and neonatal health programs
- Initiation of operations research to improve community-based management of neonatal infections
- Strengthening community mobilization for management of sepsis

(Section II provides specific guidelines for each of these broader interventions)

5 Essential Interventions

The interest areas noted above must be addressed specifically along the continuum of care. Thus neonatal health depends on adequate maternal care before and during pregnancy, childbirth, and following delivery. Ideally, many of these services would be provided at health facilities, however, the current situation, including the high proportion of deliveries occurring at home and the limitations in skilled providers, mandates short-term measures to bring services to the community, using a variety of methods. This section describes these critical interventions following a continuum of care for neonates.

5.1 Before Pregnancy

Families should be made aware of the risks of adolescent pregnancy, including early pregnancy, short birth intervals, lack of birth preparedness etc that effect health of mother and neonate. Pre-pregnancy screening for

anemia, provision of iron/folate, antihelminthic drugs and promotion of healthy-balanced diet and iodized salt contribute to good maternal nutritional status to ensure better neonatal outcome while provision of folic acid reduce the risk of neural tube defects and cleft lip. Screening for rubella in all adolescent girls along with measles/mumps/rubella vaccination should be promoted and scaled up under the national program

5.2 During Pregnancy

The effect of antenatal care (ANC) on perinatal and neonatal outcomes mostly depends on nature of interventions actually given during the contacts. In low resource settings, ANC should be focused on risk identification or detection of danger signs at the community level and providing interventions that are most critical in promoting a safe pregnancy and healthy outcome.

Key components of ANC are listed (page 54)

5.2.1 Nutrition and Health Education

Additional nutrition is essential for all women during pregnancy especially for those who are already underweight with insufficient weight gain during pregnancy. These women are at high risk of having low birth weight (LBW) babies who are more vulnerable and at greater risk of morbidity and mortality. Mothers should be counseled on good dietary habits including use of iodized salt, screened for anemia, provided iron/folate and antihelminthic drugs as necessary.

5.2.2 Education for Birth, Neonatal and Emergency Preparedness

All women and neonates need timely access to skilled care when complications arise during pregnancy, delivery and the postnatal period. This is often hampered by three delays: delay in deciding to seek care, delay in reaching care and delay in receiving care.

The strategy recommends developing a Birth, Neonate and Emergency Preparedness (BNEP) plan working with families and communities to prepare for eventualities and to overcome these delays and ensure essential care for mother and her neonate.

The key elements of BNEP are listed (page 55)

5.2.3 Education on Danger Signs and Referral

All women and family members should be made aware of maternal and neonatal danger signs. Early recognition and self-referral for specific danger signs can greatly reduce both maternal and neonatal mortality.

5.2.4 Management of High Risk Diseases

Malaria dramatically increases risk in pregnant women and jeopardizes survival of their neonates. In malaria endemic areas, use of insecticide treated bed nets (ITNs) reduces maternal risk and should be promoted through health education and advocacy.

Other diseases such as Hepatitis B infection, TB, Syphilis and HIV/AIDS also carry great risk for mothers and neonates. Health workers at all levels should appropriately counsel mothers. Risk of HIV/AIDs transmission is particularly high during pregnancy and childbirth and with initiation of breastfeeding. The GoB policy on HIV/AIDS outlines specific information for prevention of parent to child transmission (PPTCT), while establishment of VCT centre in the public health facilities are crucial in this regard.

5.3 During Childbirth

Childbirth poses risks to both mother and neonate and should ideally take place in a facility with capacity to manage emergencies. The Strategy in the current context, outlines interim feasible measures designed to reduce maternal and neonatal risk.

5.3.1 Presence of Skilled Birth Attendants at all Births

Since 85% of deliveries in Bangladesh occur at home attended mostly by relatives, traditional birth attendants and others, national efforts to train community-based skilled birth attendants (CSBA) should be accelerated. Current coverage is low (approximately 3882 CSBAs) compared to an estimated need of 13,500 to cover all wards of the 4500 unions of the country. The responsibilities of the CSBAs should be expanded to cover newborn issues through continuous support, supervision and adequate supply of drug/ logistics. Plans should incorporate innovative approaches to increase coverage, availability and use of CSBAs during delivery.

5.3.2 Presence of Trained Newborn Caregiver at Delivery

The first few minutes after delivery are crucial for the newborn and require special attention. A newborn must be dried immediately, observed for breathing, assisted for early initiation of breastfeeding, assessed for other problems and managed for any complication. Therefore it is essential to have trained newborn caregiver besides the birth attendant during delivery.

5.3.3 Essential Newborn Care

Clean and Safe Delivery

Cleanliness during delivery reduces risk of infection for both mother and baby, especially neonatal sepsis and tetanus. A Clean Delivery & Neonatal Kit (CDNK) is recommended and should be distributed through health centers, community groups, or through social marketing. It is also recommended to follow Six Principles of Clean Delivery *(page 55)*.

Prevention and Management of Hypothermia

The normal temperature range for a neonate is 97.5 - 99.50 F (36.5 - 37.50 C) . The neonate is most sensitive to hypothermia during the first 6 -12 hours of life, particularly in situations with low environmental temperature and inadequate thermal protection and therefore, immediate care to prevent and manage hypothermia is crucial.

(See interventions to prevent hypothermia in page 61)

Assessment of Breathing Status

Most neonates will start breathing spontaneously within the first minute of birth. If a neonate is not breathing after drying, it needs immediate assistance.

(See management of non breathing baby/birth asphyxia in page 63)

Breastfeeding Immediately and No Later than 1 Hour of Birth

All birth attendants and providers must know about the benefits of breastfeeding and should be trained on breastfeeding counseling and techniques. They should promote initiation of breastfeeding immediately and no

later than 1 hour, counsel for exclusive breast feeding for six months and encourage compliance to breastfeeding through advocacy and health education of family and mothers. All facilities should provide environment conducive for breastfeeding. Additional efforts to raise motivation and practice for immediate initiation and continuation of breastfeeding for mothers with caesarean sections should be in place. Feeding should be as frequent as the baby demands, without any prelacteals (plain water, sugar water, and honey etc.)

Appropriate Umbilical Cord Care

The cord stump is a major entry point for infections after birth. As such umbilical cord care should start immediately after birth following steps described in page 62.

Appropriate Eye Care

A health care provider should be immediately contacted by the family if eyes of the neonate become swollen, sticky or if there is pus draining from eyes.

Special Ccare of the Preterm and/or Low Birth Weight Neonate

Preterm or LBW neonates require special attention since they are at greater risk of mortality. Management of LBW neonates is described in page 69.

Identification, Management and Referral for Complications

A trained birth attendant should be able to identify danger signs during delivery and immediately after birth and must take swift action to manage problems and transfer the mother and neonate to a facility that offers emergency obstetric and neonatal care. All health workers must be trained in recognizing maternal and neonatal danger signs.

5.3.4 Provision of Vitamin A for Neonate and Mothers

As noted in Section 4.2, neonatal vitamin A supplementation has been shown to reduce neonatal mortality. However GoB recommends further operational research to review its efficacy & feasibility prior to scaling up.

5.3.5 Other Interventions at Facility

At facility level the health workers should also provide a number of additional interventions that include:

- Emergency obstetric and neonatal care for complications
- Management of neonatal complications
- Prevention of mother-to-child transmission of HIV
- Screening for congenital conditions

While screening for multiple conditions is yet to be considered by GoB, screening for congenital hypothyroidism is recommended. The Strategy proposes further operational research on screening for other priority congenital disorders.

5.4 After Delivery

The immediate postnatal period is particularly important for both family and providers as majority of the neonatal deaths occur during the early neonatal period. Early identification of neonatal danger signs by family members helps timely referral to trained providers or appropriate facilities to reduce neonatal morbidity and mortality.

5.4.1 Postnatal visit

There is now greater consensus on PNC interventions,[10,11] but questions remain about the best timing and place for postnatal visits, and who can deliver this package. Majority of the components of postnatal care can be carried out at the community level by a trained health worker while some skilled services need facility arrangements or a skilled health provider *(see page 57*).

The strategy recommends four post natal visits: within 24 hrs, 2-3 days, 7-14 days and within 42 days. The first three visits are particularly important for neonatal survival and health.

5.4.2 Birth Registration

Registering a neonate is the first step to establishing his or her right to a name, a nationality, health services etc. Birth registration can be done during the (1st or 2nd) postnatal visit.

5.4.3 Breast Feeding

Most healthy neonates do not need assistance with feeding if proper counseling on breast feeding and techniques are provided. Health workers (including community level health workers) who pay postnatal visits, should be trained on providing counseling for breastfeeding and proper techniques. They should help mothers establish proper breastfeeding, counsel on general breast feeding problems and refer as necessary. Every neonate should be followed during postnatal visits for exclusive breast feeding until six months.

5.4.4 Weighing, Temperature Management and Cord Care

Every neonate should be weighed at birth and weight recorded by birth attendant whether in the community or at facility. However, there might be delay in reaching the neonate at community level and thus a trained health worker may record the weight, temperature and condition of the cord at first postnatal visit.

5.4.5 Assessment and Management of Sepsis

Early identification of infection or sepsis and initiation of immediate treatment or referral for treatment are crucial to saving neonatal lives. Clean and safe newborn care prevent neonatal infections that can otherwise become life threatening. Caregivers must be able to recognize signs of neonatal sepsis and when they appear, promptly seek appropriate medical assistance

(Sepsis management: see Section 4.5 above, and page 73)

5.4.6 Assessment and Management of LBW

The baby should be weighed shortly after birth, or within 24 hours, during the first postnatal visit. A standard spring balance (e.g. Salter scale) is recommended for use at community level by community level health

workers (HA, FWA, CSBA, CNP, CHW) while at facility other standard types (Floor scales for mother and neonate) may be used. LBW neonates must be considered as special cases and managed as per guidelines *(see page 75*).

5.4.7 Counseling for Neonatal Care

First few days after delivery are very important for the mother and neonate. Support during this time can help establish exclusive breastfeeding, prevent infection by regular hand washing and maintaining general hygiene, ensure thermal protection and provide education on maternal and neonatal danger signs that could warrant medical attention. Educational program on home care, danger signs and referral is very important.

5.4.8 Referral for Immunization

A trained worker visiting the neonate can inform the family on the importance of timely vaccination and sites where vaccination is provided such as EPI outreach or facilities according to GoB immunization policy.

(Guidelines for assisted feeding for LBW neonates: see page 69)

6 Implementation

Bangladesh has a unique health infrastructure extending down to the household level that is being utilized for all sections of health including neonatal health. The Strategy depends on this infrastructure for implementation and considers a number of crosscutting issues as follows for proper implementation.

6.1 Governance

Government of Bangladesh is committed to provide health care to all the citizens in an equitable manner with transparent and efficient governance, using resources accountably through provision of stewardship, including vision and direction. The Government goes beyond the scope of MOHFW (stewardship in health) and strategic management of health system to address the inter-sectoral and socio-political environment within which the health system operates.

The HNPSP and PRSP frameworks guide the Government efforts towards supporting one national plan, and its monitoring and evaluation system. The Strategy fits within this governance system and includes guidance to strengthen environment with respect to newborn care.

6.1.1 Policies and legislation

This Strategy builds on existing policies related to maternal and neonatal care and to health infrastructure providing services. Most of the interventions in the Strategy are already approved in relevant policies. A few proposed and yet to be formalized, interventions are recommended for further operational research or feasibility test. The Strategy thus provides a permissive environment and allows further necessary exploration of promising interventions and innovations.

This Strategy promotes a coherent framework that enhances efficiency and effectiveness through:

- Adopting a home to facility health care approach for newborn services
- Reducing bureaucracy and strengthening management of these services

- Increasing cost-effectiveness and evidence-based decision making
- Improving efficiency through integration and reorganizing of newborn services
- Including quality improvement programmes
- Allocating resources effectively to address newborn health needs equitably
- Ensuring universal access to the package of newborn health care interventions
- Decentralizing operational management of the health system
- Integrating programs to improve cost-effectiveness of newborn interventions and convenience to consumers, overcoming problems of a vertical and fragmented approach.

6.1.2 Performance

The Government is committed to enhancing performance of the health system to achieve best value for available resources for neonatal health. The Government will develop and cost an operational plan for neonatal health, following a gap analysis between existing programs and plans, and implement the interventions and approaches outlined in this Strategy. This work plan will complement the work plan being developed to accelerate progress toward the relevant MDGs.

6.1.3 Financing and resource allocation

Various approaches will be considered to increase the overall fund availability for implementation of the neonatal health strategy. These include increasing efficiency of implementation through integration with other programs, advocating for greater support from development partners and alternative sources and mobilizing alternating sources through Public-Private Partnership (PPP). While most of the interventions do not require dramatic changes in resource allocation, some additional funds will be necessary to implement the Strategy in full.

MOHFW has made neonatal health a priority. To provide evidence-based interventions at 90% coverage and appropriate quality, a health worker to population ratio of 1: 4,000 for neonatal care is recommended.[24] This implies that additional 10,000 health workers should be engaged to provide community level services.

6.1.4 Human Resources

Given the context of Bangladesh with high home delivery rates, low coverage by skilled attendants and need for maternal and neonatal home visits, the Strategy requires urgent attention to improving the human resources available for service delivery.

Currently, a wide variety of health workers, from obstetricians to community skilled birth attendants, provide maternal and neonatal services. In the public system the workers are divided under the DGHS and DGFP and provide facility-based and community outreach services. At household and community level, HAs (under DGHS) and FWA & FWVs (under DGFP) are the main providers. Selected FWA/female HA or NGO equivalent health workers (3882 in 2008) have been trained in skills to conduct delivery and PNC/newborn care at home & community level.

The National Nutrition Program (NNP) supports a community level cadre of Community Nutrition Promoters (CNPs) in 172 upazilas currently, with another 100 expected by 2010. They also provide limited maternal and neonatal health services through household visits. CNPs offer an opportunity to increase coverage of appropriate neonatal interventions in NNP areas.

Beside these government cadres, NGOs and the private sector have extensive health provider networks throughout the country particularly at community level.

The APR 2007, 2009 and mid-term review 2008 of HNPSP has depicted the critical gaps in human resources for maternal and neonatal health care in the country. The National Maternal Health Strategy (2001) has comparatively a limited focus on human resource needs for neonatal services, and the Human Resource Strategy (2003) only provides general guidance. This Strategy elaborates the human resource needs for maternal and neonatal health care across the continuum of care.

Core Human Resources to Deliver Essential Service to Mothers and Neonates

The strategy equally emphasizes maternal and neonatal care as integral part of maternal and child health programming. Health providers, especially at the community level must have overlapping roles and responsibilities, which need to be synchronized for effective implementation and increased coverage.

It is therefore crucial to complete workforce planning by relevant directorates to analyze existing cadres and make recommendations for recruiting and capacity building for appropriate work force at all levels.

At home and community levels, essential neonatal care will be provided by the following:

- A 'birth attendant': a skilled or unskilled worker, representing whoever usually attends childbirth (e.g. CSBA, FWA, CHW, or others)
- A separate 'newborn caregiver': one family member or volunteer from the community, oriented to take care of the neonate. Community health workers can do the orientation during antenatal home or facility visits.
- Additional neonatal services (e.g. routine postnatal checks, counseling reinforce newborn care by family, selected oral and injectable medication for neonatal sepsis) will be provided by trained FWAs, HAs, CNPs or equivalent CHWs in the non public sector per GoB protocols

[Annex 1 (page 80) outlines the major human resources for maternal and neonatal health services by interventions]

Training, Orientation and Supervision

Training and capacity building is crucial for implementation of the interventions outlined in the strategy with upgrading of knowledge and skills at all levels. The specifics of the training curricula modifications, based on current and upcoming needs, will be defined through further discussion at the national level. The major national and sub-national institutes will play a vital role in training through integrated maternal and neonatal health human resource planning. Specialized training programs, including pre-service academic programs will be undertaken as part of short-term and long-term human resource development in order to meet the needs. The training package by level and categories of provider is listed in *Annex 2 page 82*.

Orientation

Besides health workers, someone from family or community preferably the non-formal providers like village doctors, drug sellers, TBAs could be orientated on neonatal danger signs, importance of safe and clean delivery, maternal danger signs, or selected neonatal care as per national guidelines. Their services will be useful in immediate neonatal care and referral of complications in absence of skilled providers.

Supervision

The human resource development must be accompanied by a clear supportive strategy for supervision, based on existing supervisory structure. Supervision will be most critical during the initial implementation of the neonatal strategy to monitor quality of implementation. Strengthening and revitalizing Union health committees for supportive supervision and accountability at local level using local level data for decision making, will add further value.

Issues for Further Discussion

Further discussion is needed on a number of activities that will be undertaken to strengthen the human resource capacity for neonatal service delivery and include:

- Reviewing job descriptions of providers at all levels and integrating skills supporting delivery of essential services to neonates
- Identifying additional human resources outside the health system (including facility aids, other providers, family members or community volunteers) for orientation on providing immediate supportive care for neonates
- Establishing linkages within the health system for expanding supportive supervision to cover neonatal services
- Continuing technical working group discussions on addressing gaps in service provision through alternative providers (e.g. non-formal providers such as CHWs, and village doctors etc.) for provision of selected neonatal services
- Human resource IW - training & utillization

6.1.5 Logistics and Supply Systems

HNPSP defines objectives to make the current logistics system more effective and efficient through reducing distribution times, minimizing system losses, establishing management control, installing greater accountability and generating regular and reliable inventory transaction data. An improved and better coordinated procurement and distribution system should improve service quality, minimize stock outs, motivate employees and improve client confidence in facility care. Supplies for maternal and neonatal services will be integrated into this improved logistics supply system, with special attention to needs at the community level.

(A list of supplies and logistics is presented in Annex 3 page 82, 83)

6.2 Communication, Participation and Partnerships

This Strategy depends in part on improving awareness and changing behaviors of mothers and families related to neonatal care, and thus requires a strong BCC program. This section provides an overview of the basic elements of such a program, which will be developed in detail as part of the implementation plan for the Strategy.

6.2.1 Behavior Change Communication for Neonatal Health

The BCC program will primarily aim at adopting healthy home care practices and timely care seeking among mothers, family members and other newborn attendants, and increasing quality of care at the health facility

level. Overall awareness for preventing neonatal health problems, recognizing newborn illness and seeking appropriate and timely care are very low among mothers, mothers in law, husbands and other attendants.

At facility level, the BCC program will strengthen provider awareness and skills, and will also address issues of weak inter-personal communication skills, insufficient communication materials, and low-motivation.

Target Groups for Advocacy and Behaviour Change

- Primary participants: Pregnant mothers, nursing mothers, husbands, mothers-in law and other family members
- Secondary participants: Service providers at all levels, NGO field workers, community support group members, community volunteers, community leaders, and village practitioners
- Tertiary participants:
  - National level- policy makers, members of national implementing and professional bodies, development partners, civil society members, representatives from private and relevant corporate sector representatives
  - Local level- decision makers and members of implementing bodies, representatives from the public and private sectors and civil society at the district, upazila, and union levels.

Opportunities for Communication for Neonatal Health

The communication strategy for neonatal health will build on existing experiences and gathered evidence. Several factors provide opportunities for the BCC program:

- Data is available on neonatal mortality and morbidity
- IMCI is being implemented by the Government throughout the country as priority program, and the Neonatal Strategy can be integrated with this effort
- Community-based maternal and neonatal interventions like Projahnmo, ACCESS, JivitA and others provide in-country evidence for best practices
- Community-based skilled birth attendant training includes some elements of the neonatal health strategy, and is being accelerated
- The Women Friendly Hospital Initiative and Baby Friendly Hospital Initiative are being implemented
- Training of providers on ENC has been initiated using WHO -ENC course

Communication Approach

In order to achieve the BCC objectives, a multi-level, multi-media communication approach will be adopted. The approach will include mutually supporting steps of advocacy, social mobilization, community participation and BCC in a continuous process.

A media strategy will be included as part of the overall BCC program. In Bangladesh media has emerged as a powerful channel for communication and influencing behavior. Thus different forms of media - print, electronic, interactive and outdoor media will be considered, based on proven effectiveness to reach different target groups.

A detailed BCC program implementation plan based on existing experiences will be developed in consultation with all stakeholders after finalization of the Strategy. The plan will be implemented in phases, using different

communication methods in different timeframes. The draft plan will be shared with all concerned to solicit comments and to avoid duplication with other communications strategies.

6.2.2 Strengthening Partnerships

A systematic and coordinated partnership between the Government and development partners is critical for implementation of this Strategy. The partnership needs to provide an organisational structure that ensures a single point for engaging with development partners. The Ministry of Health and Family Welfare must facilitate development of a partnership based on Government stewardship and mutual respect between the Government and its partners, to ensure coordinated action aimed at strengthening maternal and neonatal health.

Partnerships with researchers and program experts from within and outside the countries should be maintained and promoted. In addition, the Government should encourage more partnerships with multilaterals, development partners and Global Health Initiatives that support maternal, neonatal and child health. The predominantly in the United Nations system, play an important normative, developmental and technical role and their expert views should continue to inform the process of implementation.

6.2.3 Involvement of Professional Bodies

Active participation of the Government, private practitioners and professional bodies has potential for strong influence over professional practice and behavior. The professional societies in the country: the Bangladesh Paediatric Association, Bangladesh Neonatal Forum, Bangladesh Perinatal Society, Bangladesh Breastfeeding Foundation and Obstetrical and Gynecological Society of Bangladesh (OGSB) have been playing a vital pivotal role as professional bodies to assist the Ministry of Health and Family Welfare and GoB partners in making progress with neonatal survival. The technical expertise based on the experience of these bodies is invaluable in developing and implementing this Strategy.

Neonatologists, pediatricians and their societies have been working on neonatal health, for a long time and promoting improvement of neonatal health over the recent years. In addition to neonatal care, pediatricians are taking leading role in supporting ENC training, the breastfeeding movement, IMCI, and other child health programs. OGSB, the professional body of obstetricians and gynaecologists, has a long history of implementing maternal health care in the country through experts within institutions and in the private sector. OGSB also initiated and is still supporting EOC and CSBA training. Besides maternal care, immediate care of the neonate during childbirth and neonatal period also largely lies with obstetricians.

Continued support and contribution of these professionals during policy dialogue, program monitoring, pre-service (medical college, university) and in-service education and training will be sought for finalization and implementation of this Strategy, under Government stewardship.

6.3 Integration of Services for Neonates

Successful implementation of neonatal health interventions depends on integrating them within existing child and maternal health programs.

Both the directorates (DGHS & DGFP) under MOHFW have countrywide access to pregnant woman and neonates through household visits, EPI, outreach/satellite clinics, community clinic and union level facility (U&FWC/sub-centre) services. This huge field workforce and infrastructure should be utilized through enhanced collaboration and integration for related programs and activities, to accelerate progress towards MDGS 4 & 5. All community workers should be trained to have a basic understanding of maternal and neonatal care.

Operation research should be completed to define the exact roles and responsibilities for different cadres of workers with respect to specific interventions. All neonatal issues should be included under the national health and family planning campaigns in addition to initiating a special neonatal health campaign in the country.

The following programs can easily integrate many elements of this Strategy.

6.3.1 Integrated Management of Childhood Illness (IMCI and C-IMCI) and Neonatal Health

Neonatal health can be integrated with both facility and community IMCI. Integrating 'Zero' day within the national "IMCI protocol" which now covers care from day 1 to 59 months is critical. Moreover, Essential Newborn Care (ENC) should be an integral part of all educational efforts for mothers. Workers at the community level (GoB & NGO) and volunteers responsible for community IMCI can thus help in neonatal survival.

This Strategy calls for integrating all relevant neonatal interventions into the training and implementation of C-IMCI, transforming it into C-IMNCI (community Integrated Management of Neonatal & Childhood Illness). In addition, as part of facility strengthening, the Strategy will integrate appropriate care for neonates delivered in facilities, and referred from the community, into relevant IMCI protocols.

6.3.2 National Nutrition Program (NNP)

The NNP (covering 172 upazilas by 2008) has proved its efficiency in supplementary feeding for malnourished pregnant women, which contributes to preventing LBW. The unique status of CNPs as service providers living in the communities they serve makes them ideal for provision of early care to mothers and neonates. The existing house-to-house services provided by CNPs offer a unique opportunity for integration of other key maternal and neonatal interventions.

This Strategy will expand the services provided by CNPs, by including maternal and neonatal health messages. In addition, following human resources review, further operational research will be considered regarding use of CNPs for other community-based interventions.

6.3.3 Emergency Obstetric Care (EmOC)

All related health facility service providers and hospital support staff should be trained on Essential Newborn Care, neonatal danger signs, emergency newborn care and the interventions and approaches outlined in this Strategy. This can transform the EmOC program into an EmONC (N for neonatal) program.

6.3.4 Community-based Skilled Birth Attendants (CSBA)

The CSBA program includes household visits for ANC, skilled care at birth, PNC, neonatal care and referral. The program should be scaled up rapidly to expand coverage. There should be a special focus on ENC, danger signs for referral, resuscitation for birth asphyxia and management of sepsis and LBW.

The period immediately after birth is critical for the neonate, and thus attendance at birth by a trained worker is critical for the health of mother and neonate. The GoB is expanding services for deliveries through expansion of a facility-based nurse-midwife program, and expanding training for CSBAs. Realistically, this will take a number of years. This Strategy provides for additional support during this critical period through use of a neonatal attendant, using existing community workers, as noted earlier.

6.3.5 Health education

DGHS and DGFP through HEB and IEM channels will promote ENC messages, neonatal danger signs, and other educational elements of the Strategy, for nation wide information dissemination.

7 Supervision, Monitoring and Evaluation

Monitoring and evaluation of performance of the health system depends on the generation and use of sound data on health system inputs, processes, outputs and outcomes. Health programmes must be responsive to health problems, and address gaps in service provision-identified through careful monitoring. Countries must ensure that the health system data collected are accurate, so they reflect both the performance of the system as well as the relevance of the programmes to health problems. The adequacy of a monitoring and evaluation system may be assessed by the regularity, completeness and quality of reports.

This Strategy will use existing monitoring systems, but will require some adaptation to ensure that there is adequate information available for specific neonatal interventions. While it is beyond the scope of this Strategy document to outline a full monitoring and evaluation plan, a technical working group should review existing monitoring information, and recommend changes related to neonatal interventions.

Periodic reviews should be done to identify best practices, more effectively address obstacles, strengthen the partnership approach and accelerate progress in the implementation of this Strategy. Quality assurance should be an integral part of the implementation of the Strategy at all levels.

(Guidelines on supervision, monitoring and evaluation in page 77)

8 Operation Research and Future Direction

As noted earlier, the Strategy provides policy guidance for strengthening neonatal health based on existing evidence for the effectiveness of a variety of interventions. As with all health programs, new interventions are being tested, and new recommendations will be made from global partners based on the results of new research. Many neonatal interventions and implementation approaches are relatively new, and others have not yet been fully tested. For these reasons, this Strategy includes operational research as a means of providing a permissive environment in which to further explore new interventions, and innovations in service delivery.

Several interventions and approaches currently fall into this category, including:

- Neonatal vitamin A supplementation
- Screening for neonatal conditions
- Maternal interventions to reduce impact of eclampsia (calcium) and postpartum hemorrhage (misoprostol)
- Neonatal interventions to reduce risk of infection (chlorhexadine), or strengthen management of sepsis (community-based classification and treatment)

- Comparative studies of different cadres of workers for effective implementation of neonatal interventions
- Incentive mechanisms to improve skilled birth attendance and use of facilities for deliveries
- Coverage and innovations on PNC with special focus to neonates at community
- Operation research on first hour breastfeeding, exclusive breastfeeding and continued breastfeeding for 2 years especially at community level

Future promising interventions have been recommended for operatiol research once reviewed by a Government appointed technical working group convened to review preliminary evidence.

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Section II

Guidelines for National Neonatal Health Strategy

Summary Newborn Interventions Packages

Pre-pregnancy

- Education for risk factors
- Screening for risk conditions
- Preventive measures

During Pregnancy

- Antenatal Care
  - At least 4 visits preferably completed at facility.
  - Basic ANC at home and facility (ref. table 1.2.3, page 54)
  - Comprehensive and complete ANC at facility
- ANC components would vary based on the risk of mother and fetus and level of services: home, outreach, facility.

Note: At community level, FWV, CSBA, FWA, Female HA and similar NGO workers may provide part of ANC components (section II, table 1.2.3, page 54), however, to complete all components, they should refer all pregnant women to facility.

During Childbirth (Delivery and Newborn Care)

Community/home delivery care and ENC

- Presence of skilled birth attendant at all births
- Presence of trained newborn attendant at delivery to assess newborn
- Essential Newborn Care (Box 1.3.4, page 58)

Facility level delivery care and ENC

- All of the above plus
- Emergency obstetric and neonatal care
- Antibiotics for premature rupture of membranes
- Management of neonatal complications
- Prevention of mother-to-child transmission of HIV
- Screening for congenital diseases

After delivery

- 4 postnatal visits: within 24 hours, on 3rd day, between 7-14 days, and within 42 days

Community/home PNC (table 1.4, page 58)

- Birth registration
- Postnatal Care for mother and neonate

Facility level delivery care and PNC (table 1.4, page 58)

- All above plus
- Screening for congenital hypothyroidism
- Management of maternal complications
- Follow up of neonates in need of special care

1. Guidelines for Maternal Care

1.1. Broad Strategic Actions by Level of Care

Level	Strategies
▶ At all levels	▶ Increase availability of skilled birth attendant at birth at home and facility, including CSBAs, nurse-midwives, midwife cadre ▶ Increase coverage of skilled attendence at birth both at community & facility ▶ Strengthen the linkage between communities and facilities to improve referral services ▶ Establish GoB-NGO partnership/collaboration to improve community and union level maternal and neonatal services ▶ Develop and implement a comprehensive and integrated BCC plan to improve awareness and behaviors related to ENC, including maternal and neonatal danger signs (see below).
▶ At household and community levels	▶ Ensure awareness among adolescent girls, pregnant women and mothers about the maternal and neonatal danger signs with promotion of healthy practices that can improve maternal and neonatal health ▶ Strengthen capacity of CHWs, CSBA, FWA and HA working at the community level to educate mothers and provide basic maternal and neonatal services
▶ Union levels	▶ Ensure and expand services through satellite, outreach, and community clinics ▶ Strengthen and optimize use of union level facilities e.g. community clinics, UH&FWC and union sub-centers) for providing essential maternal and neonatal care including Obstetric first aid, basic EmOC and ENC
▶ Upazila levels	▶ Build capacity of all health workers engaged in improving awareness on maternal and neonatal health needs, and in provision of essential and critical maternal and neonatal care and services ▶ Strengthen all upazila facilities for ANC, normal deliveries, PNC, and neonatal care and referral management ▶ Expand and ensure 24 hours/7 days EmOC and ENC services in all upazila facilities
▶ District level and above	**District Level** ▶ Build capacity of all district facilities in provision of quality maternal and neonatal care including management of complications with special maternal and neonatal care units ▶ Strengthen district level training capacity in maternal and neonatal health through functional coordination and participation between DH, MCWC, FWVTI and Nursing Institutes **Tertiary Level** ▶ Ensuring adequate backup support through neonatal and maternal intensive care units (NICU & MICU) at Medical College Hospitals and tertiary level institutes ▶ Plan phased strengthening of medical colleges and institutes by increasing specialty services in feto-maternal medicine and neonatology, building faculty capacity to meet future needs ▶ Strengthen and optimize use of union level facilities e.g. community clinics, UH&FWC and union sub-centers) for providing essential maternal and neonatal care including Obstetric first aid, basic EmOC and ENC

1.2. Guidelines for Interventions During Pre-pregnancy, Pregnancy, Childbirth and Postnatal Period

1.2.1. Guidelines for Pre-pregnancy Interventions

Intervention	Guideline
► Education for risk factors	► Education on risk factors includes explaining the risk of: young age at first pregnancy, short birth intervals, lack of pregnancy and delivery planning, poor nutrition
► Screening for risk conditions	► Screening is recommended for anemia and rubella and vaccination for rubella
► Preventive measures	► Iron/folate should be provided, and use of iodized salt should be promoted for all women anticipating pregnancy ► Vaccination for Rubella is to considered as per national guidelines

1.2.2. Guidelines for Interventions During Delivery

Broad Strategic Actions at Community and Home level	
Intervention	**Guidelines and Activities**
► Registration of pregnant women	► All pregnant women should be registered and reported
► Counseling for birth, neonate and emergency preparedness (BNEP)	► Mothers/families should be counseled on BNEP (table 1.2.4) at first home visit and should be updated through subsequent visits.
► Nutrition and health education	► Mothers should be counseled on adequate nutrition which includes: ▬ Eating an extra serving of a staple food and eating foods rich in vitamins and minerals; avoiding a low calorie diet (designed keep a small baby) ▬ Avoiding becoming overworked, in order to preserve caloric energy ▬ Taking recommended iron/folate tablets to reduce maternal anaemia ▬ Using iodized salt to protect themselves and their new babies from mental or physical problems caused by iodine deficiency ▬ Taking medication for deworming after the first trimester, especially in helminthes endemic areas ▬ Considering protein-energy supplementation provided by a specialist at referral centers, if extremely undernourished

Intervention	Guidelines and Activities
▶ Education on Essential Newborn Care (ENC)	▶ All pregnant women should be counseled on ENC (1.3.4)
▶ Education on maternal and neonatal danger signs (table 2.3) and referral	▶ All mothers should be educated to recognize both maternal and neonatal danger signs, and seeking care from health providers for those conditions. These messages should be reinforced at all ANC visits
▶ Management and referral for other risk diseases	▶ All pregnant women should be referred to appropriate facility for screening and management for syphilis, asymptomatic bacteruria, diabetes or any high risk condition as per national guidelines. ▶ All pregnant women should use ITN in malaria endemic area
Broad Strategic Actions at Facility Level	
▶ All the above plus	
▶ Examination and assessment for obstetric risk	▶ Examination should include BP, abdominal exam ▶ Assessment includes review of danger signs (see table below)
▶ Immunization	▶ Immunizations should be provided per GoB EPI protocols, and should include tetanus toxoid, pentavalent vaccine
▶ Screening and treatment for risk diseases	▶ Screening should be done for bacteriuria, urinary protein and sugar, STIs, including syphilis, TB and other risk diseases
▶ Voluntary counseling and testing for HIV	▶ Counseling should be provided per GoB HIV/AIDs policy
▶ Preventive measures	▶ Early diagnosis and prompt treatment for malaria in endemic area ▶ Calcium supplement (as per national guidelines)

1.2.3 Basic ANC[a]: Components by Visits

Antenatal visits Basic components	**First visit (~16 wks)**		**Second visit (26 wks)**		**Third visit (32 wks)**		**Fourth visit (38 wks)**	
Level of care	Home	Facility	Home	Facility	Home	Facility	Home	Facility
Complete antenatal card	+	+	+	+	+	+	+	+
Clinical examination	+	+	+	+	+	+	+	+
Clinically severe anaemia? Hb test	+	+	+	+	+	+	+	+
Ob. Exam: gestational age estimation, uterine height and *fetal heart rate during 2nd, 3rd, 4th visit*	+	+	+	+	+	+	+	+
Gyn. Exam (can be postponed until second visit)	+	+	+	+	+	+	+	+
Blood pressure taken	+	+	+	+	+	+	+	+
Maternal weight / (height at 1st visit)	+	+	+	+	+	+	+	+
* Rapid syphilis test performed, detection of symptomatic STIs	-	+						
Urine test (multiple dipstick) performed	+	+	+	+	+	+	+	+
* Blood type and Rh requested	-	+						
* Tetanus toxoid given	-	+	-	+	-	+	-	+
Fe / Folic acid supplementation provided	+	+	+	+	+	+	+	+
Recommendation for emergencies-counsel woman & family for BNEP	+	+	+	+	+	+	+	+
Instructions for delivery/plan for birth					+	+	+	+
Recommendations for Breast feeding / contraception					+	+	+	+
Detection of breech presentation and referral							+	+

Notes:

1. Antenatal care will be provided by skilled providers: at community by CSBA and at facilities by other skilled providers like FWV, Nurse-Midwife, MA/SACMO, doctors, and specialists.
2. + : to be accomplished at mentioned level and
3. '-' : to be referred to facility for the activity
4. FIRST VISIT for all women will be her first contact either by the skilled health worker at community level or in clinics, regardless of gestational age. If first visit is later than recommended, its needed to carry out all activities up to that time
5. ANC at home level will be provided by CSBA or similar work force as per protocol, and will refer all to facility/outreach/satellite clinic for selected component items of ANC package marked with * in the above table. They shall refer all pregnancies with risk or danger signs to facility for full ANC or management as applicable.

a To standardize ANC at all level, Basic ANC recommended by WHO has been proposed under this strategy. Reference: WHO Antenatal Care Randomized Trial: Manual for the Implementation of the New Model: WHO publication in www.who.int/reproductive-health/publications/RHR_01_30/RHR_01_30_chap4.en.html

1.2.4 Components[b] of Birth, Neonate and Emergency Preparedness (BNEP)

Major Components of BNEP Package
▶ Selecting a birth location (preferably health centre or hospital. In case of home births, select a suitable part of house)
▶ Identifying the location of the closest appropriate care facility, in case of emergency
▶ Identifying a skilled attendant
▶ Identifying a trained neonatal attendant (newborn caregiver) to exclusively support the neonate at birth place
▶ Identifying a companion to be present at birth and in case of emergency
▶ Identifying support for taking care of home and children during birth and emergency
▶ Arranging transport for facility-based birth and in case of emergency
▶ Planning for funds for birth-related and emergency expenses
▶ Having adequate supplies for birth (depending if at home, in a health centre or hospital): a clean delivery kit (1.3.2) and food and water for mother and companion
▶ Identifying a compatible blood donor in case of haemorrhage

Section II

1.2.5 Danger Signs in Mother and Neonate

Maternal Danger Signs
▶ **Bleeding**: bleeding during pregnancy, excessive bleeding during birth, postpartum or retention of placenta
▶ **High Fever**: high fever for more than 3 days during pregnancy or postpartum, or foul smelling vaginal discharge
▶ **Prolonged labour**: labour more than 12 hours or any part of foetus other than the head coming out per vagina during birth
▶ **Convulsion**: convulsion during pregnancy, birth, postpartum
▶ **Headache and Blurring of vision**: Swelling of body, excessive headache and /or blurring of vision during pregnancy, birth, postpartum
Neonatal Danger Signs
1. Not feeding well
2. Low body temperature (less than 35.5ºC or 95.5ºF) or Fever (37.5ºC or more than 99.5ºF)
3. Fast breathing (60/min or above)
4. Severe chest in-drawing present
5. Movement only when stimulated or no movement at all
6. History of convulsion
7. Umbilical redness extend to skin

b The package has been adopted from the WHO - Birth Preparedness Package (BPP) and the components focuses on both maternal and neoantal preparedness to improve maternal and neonatal survival.

1.3 Guidelines for Interventions During Childbirth

Broad Strategic Actions at Community and Home Level	
Intervention	**Guidelines and Activities**
► Presence of skilled birth attendant at all births	► All deliveries should be attended by a skilled provider (including CSBA)
► Presence of trained neonatal attendant at all births	► Neonatal caregivers will be oriented/ trained on ENC, as appropriate, to ensure neonatal care
► Promote Clean delivery	► Follow the six principles of clean delivery ► Use of clean delivery kit
► Essential Newborn Care [ENC]	► Follow recommended standard package for ENC as applicable ► Follow guidelines for birth asphyxia, mouth to mouth resuscitation as appropriate
Broad Strategic Actions at Facility Level	
All above plus	
► Essential Newborn Care [ENC]	All providers should be trained on bag and mask resuscitation in addition to "mouth to mouth resuscitation"
► Emergency obstetric care for complications	Mothers should be assessed for danger signs or following conditions: ► Vaginal bleeding ► Prolonged /Obstructed labour ► Hand/Cord prolapse ► Premature Rupture of Membrane ► Convulsions ► Fever ► Fast and difficult breathing ► Severe abdominal pain
► Antibiotics for premature rupture of membranes	Women with clear evidence for premature rupture of membranes should be considered for antibiotic treatment
► Management of neonatal complications	All facilities should be prepared to manage neonates referred for complications, with an upward referral mechanism in place
► Prevention of mother-to-child transmission of HIV	Mothers (of high risk group) should be counseled in accordance to GoB policy on PMTCT and VCT
► Screening for congenital diseases	All neonates should be examined for physical congenital anomalies, and for congenital hypothyroidism

1.3.1 Six Principles of Clean Delivery

Six Principles of Clean Delivery

- Clean attendants' hands
- Clean perineum
- Nothing unclean introduced into the vagina
- Clean delivery surface
- Clean cord-cutting (new/sterile razor blade or surgical blade),
- Clean cord care (clean/sterile thread /cord clamp)

1.3.2 Proposed Elements of Clean Delivery and Neonatal Kit

Elements of a Clean Delivery and Neonatal Kit (CDNK)

- Soap
- Plastic sheet
- New/sterile blade or surgical blade for cutting cord
- Sterile thread for tying cord
- Two pieces of gauze or similar cloth
- Two pieces of cloth for drying and wrapping of neonate

1.3.3 Neonatal Caregiver at Community Level

Neonatal Caregiver : An opportunity

- Essential Newborn Care services [1.3.4] will be provided by:
  - Attendants during child birth: e.g. CSBA, FWA, CNP, CHW or similar NGO workers
  - A family member/relatives/volunteer oriented on ENC to take care of the neonate. The orientation may take place during antenatal visits by health workers
- Drugs and injectables for neonate, as per protocol, will be provided by:
  - CSBA, FWA, HA or
  - Other equivalent trained community level health workers (CHW) within non-public sector

1.3.4 Essential Newborn Care

The standard package of Essential Newborn Care consists of the following:

1. **Clean and safe delivery**
   i. Clean cord cutting and tying
2. **Prevention and management of hypothermia (see table 2.2, page 61)**
   i. Drying and wrapping
   ii. Skin-to-skin
   iii. Delayed bathing
3. **Assessment of breathing status (management of birth asphyxia)**
   i. Tactile stimulation
   ii. mouth-to-mouth resuscitation, bag and mask resuscitation
4. **Initiation of breast-feeding immediately after birth and no later than 1 hour of birth**
5. **Appropriate cord care**
   i. Apply nothing to cord
6. **Appropriate eye care**
7. **Provision of special care for LBW neonates**
   i. 2 extra home visits
   ii. Assisted feeding if needed
8. **Identification, management and referral for complications**

1.4 Guidelines for Interventions after Delivery

Intervention	Guidelines and activities
At Home and Community level	
► Birth registration	► All neonates should be registered, and all care providers should support local govt. for full coverage of birth registration
► Breast Feeding	► Mothers/families should be counseled on early (within 1 hour) and exclusive breastfeeding, ► Mothers should be coached on appropriate breastfeeding techniques ► Family/community members should support Breast feeding
► Weighing, temperature management and cord care	► Weighing should be done using a Salter or equivalent scale at birth or within 72 hours of birth ► Management of hypothermia and cord care by mother or family should be reviewed at postnatal visits as per guidelines

Intervention	Guidelines and activities
At Home and Community Level	
► Assessment and management of LBW	► Neonates identified as LBW (<2500 gms) should be managed according to LBW guidelines (See table 5 Annex 5) ► Neonates < 1800 gms should be immediately referred
► Counseling for newborn care, including neonatal danger signs	► All neonates should be assessed for danger signs, and mothers should again be counseled about neonatal danger signs
► Assessment and initiation of care for sepsis, and referral	► All neonates should be assessed for signs of sepsis ► Manage and refer neonates with sepsis as per neonatal sepsis guidelines (See also table 6)
► Referral for immunization	► Mothers with her neonate should be referred for immunization, according to EPI guidelines
► Postnatal care for mother	Postnatal care for mother includes: ► Counseling on rest and nutrition ► Counseling on birth spacing/post partum contraception ► Prevention of mother-to-child transmission of HIV ► Awareness of maternal danger signs (bleeding, foul vaginal discharge, fever and breast problems), and referral ► Preventive measures including iron folate for anaemia, vit A supplementation 2 lac IU single dose immediately after childbirth
At Facility Level	
All the above plus	
► Screening for congenital hypothyroidism	All neonates should be screened for congenital hypothyroidism and physical congenital defects, and managed/referred as needed
► Follow up of neonates in need of special care	Special care includes: ► Assisted feeding ► Management of complications ► Management of serious infections ► Treatment of severe jaundice ► Management of very low-birth-weight babies (<1800 gms)
► Management of maternal complications	► All mothers should be assessed for complications, and managed /treated as applicable

1.4.1 Ten Steps to Successful Breastfeeding at Facility[c]

MOHFW promotes, protects, and supports breastfeeding through the "Ten Steps to Successful Breastfeeding" in maternity service facilities. These steps are:

1. Maintain a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
6. Give infants no food or drink other than breastmilk, unless medically indicated.
7. Practice "rooming in"-- allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand (unrestricted breastfeeding
9. Give no pacifiers or artificial nipples to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic

2 Guidelines for Healthy Newborn Care

2.1 Broad Strategic Actions by Level of Care

Level	Strategies
► At all levels	► Increase availability of trained health personnel at birth, including CSBAs, nurse midwives, midwife cadres and increase their coverage of home and facility deliveries ► Strengthen the linkage between communities and facilities to improve referral services ► Establish GoB-NGO partnership/collaboration to improve community and union level maternal and neonatal services ► Develop and implement a comprehensive and integrated BCC plan to improve awareness and behaviors related to ENC, including maternal and neonatal danger signs (see below)
► At household and community levels:	► Raise families' and communities' awareness on healthy newborn care, danger signs, and avoidance of harmful traditional practices through BCC messages and tools ► Develop capacity of skilled attendants to mobilize assistance of non-formal caregivers for neonatal care. ► Develop non-formal care providers from the community with capacity to provide basic neonatal care at birth, identify dangers signs and manage some immediate needs and early refer to appropriate facility

c As outlined in the national BFHI program jointly implemented by Govt and UNICEF/WHO.

Level	Strategies
▶ Outreach level & Union level	▶ Counseling & education on ANC, TT, Iron-folate, birth preparedness, clean & safe delivery, ENC and PNC ▶ Strengthen activities through outreach, satellite clinic and community clinics for ANC, PNC, counseling and awareness program ▶ Strengthen and optimize use of union level facilities (UH&FWC and union sub-centers) for providing essential maternal and neonatal care including Obstetric first aid, basic EmOC and ENC
▶ Upazila level	▶ Develop and strengthen facilities for maternal and newborn care, ▶ Ensure basic and emergency health care services for mother and newborn ▶ Counseling & education on ANC, TT, Iron-folate, birth preparedness, clean & safe delivery, ENC and PNC ▶ Provision of immediate newborn care*, newborn resuscitation, and identification & management or upward referral of sick newborns according to guidelines
▶ District level and above	▶ Provide essential newborn care services with proper diagnosis and management of sick newborns and their mothers

* Immediate newborn care = drying, wrapping, tactile stimulation and early initiation of breast feeding

2.2 Guidelines for Healthy Newborn Interventions

Intervention	Guidelines and Activities
Provide clean & safe delivery and health education for neonatal health	▶ All birth attendants counsel and provide for clean and safe delivery as per guidelines.
Prevent and manage hypothermia	▶ **Dry and wrap the baby immediately after birth:** Quickly wipe the baby dry from head to toe to stimulate the baby. Remove the wet cloth and wrap the baby with another dry and warm cloth. ▶ **Delay the first bath for at least three days:** Bathing the newborn soon after birth causes a drop in the baby's body temperature. Though some of the vernix may remain after drying it need not be removed as it is harmless, and may reduce heat loss. ▶ **Promote breastfeeding:** Early initiation (not later than 1 hour)and frequent breastfeeding reduces possibility of hypoglycemia, risks of hypothermia and improves immunity. ▶ **Promote early skin-to-skin contact:** Skin-to-skin contact is an effective method of preventing heat loss in newborns full term or preterm. Early skin-to-skin contact involves placing the naked baby prone on the mother's bare chest or abdomen at birth or soon afterwards (< 24 hours) as it has just the right temperature for the newborn. The mother and infant should be covered with a clean, warm cloth. ▶ **Clothe baby and encourage sharing bed with the mother:** A neonate should be covered from head to toe with a warm cloth as much as possible. If needed, a cap to cover the head. In the first few days after birth, the newborn should be protected using clothing appropriate for the environmental temperature. Babies should be kept with their mothers as much as possible throughout the day. Keeping the baby in the same bed with mother helps to keep baby warm and breastfeed on demand.

Intervention	Guidelines and Activities
Promote initiation of breathing (prevention and management of birth asphyxia)	► All health workers should provide immediate attention to initiation of breathing. Most newborns will start breathing spontaneously within the first minute of birth. ► If a newborn is not breathing after drying and stimulation, manage according to birth asphyxia guidelines (algorithm 4.4)
Promote initiation of breastfeeding immediately after birth and continuation of exclusive breastfeeding for 6 months	► Breastfeeding should be initiated immediately but no later than 1 hour after birth, and exclusive breastfeeding should continue for 6 months. Feeding should be as frequent as the baby demands, without any prelacteals (e.g. plain water, sugar water, honey and mastered oil). ► Counseling on the importance of breastfeeding and other time-appropriate topics regarding feeding should be provided for families and communities by health workers and managers as proposed by National Strategy on Infant and Young Child Feeding.
Ensure appropriate cord care	Appropriate cord care is an integral part of ENC and includes: ► **Hand washing:** The birth-attendant/neonatal caregiver must wash hands with soap before cutting the cord. ► **Tying the cord:** Before cutting, the cord should be tied in at least three places using a clean/sterile thread: the first thread at about two finger widths from the abdominal wall, the second thread one finger width away from the first one, and the third should be tied four finger widths away from the second. ► **Cutting instrument:** The cord must be cut with a sterile surgical blade or a new razor blade. ► **Cutting technique:** The cord should be cut in the space between the last two ties, and about one finger width away from the second one. ► **Applications to the cord:** The cord should be kept clean and dry after cutting. Nothing should be applied to the cord. However, if the cord is very soiled after cutting, then it may be gently cleansed with clean preferably boiled water.
Provide early eye care	► The family should contact a health care provider if eyes become swollen, sticky or if there is pus draining from eyes.
Complete thorough examination of newborn	► Rapid assessment of the baby should be done soon after birth for: identification of sex, assessing vital signs, and checking for major anomalies. ► The neonate should be examined for any congenital anomalies demanding surgical attention including imperforate anus, cleft lip or palate ► Finally, the birth attendant should assess the newborn's respiration pattern, colour, posture, spontaneous activity, and breast-feeding.
Prevent and manage neonatal sepsis	► Build awareness among mothers, family on neonatal danger signs and prevention of neonatal sepsis ► Assess and manage per sepsis guidelines (table 5.3)
Provide additional attention to pre-term or LBW newborns	► Follow guidelines for identification and management of LBW neonates as provided in table 4.3.
Counsel parents and family on Danger signs	► Counsel parents on neonatal danger signs so that they can seek care immediately from a health care provider or health facility if the newborn has any danger signs.
Ensure specialized care support	► Upazila and district facilities should provide more specialized services including phototherapy, assisted feeding/IV infusion, and intensive care services.

3. Guidelines for Birth Asphyxia

Birth asphyxia is defined[F] as a 'failure to initiate and sustain breathing at birth' is associated with various conditions including prolonged labor, inappropriate use of oxytocin, poor placental function of any cause, prematurity, cord prolapse or compression, placental abruption, severe meconium aspiration, congenital cardiac or pulmonary anomalies, and birth trauma. In Bangladesh Context, Birth asphyxia can be recognized by following symptoms/signs if one or more is present as:

- **Community-level:** No respiration, no cry; gasping respirations with long pauses in between
- **Facility-level:** No respiration, no cry; gasping respirations with long pauses in between; blue or pale color; heart rate absent or < 100 beats/min.; flaccid or reduced muscle tone; low APGAR score

Section II

3.1 Broad Strategic Actions by Level of Care

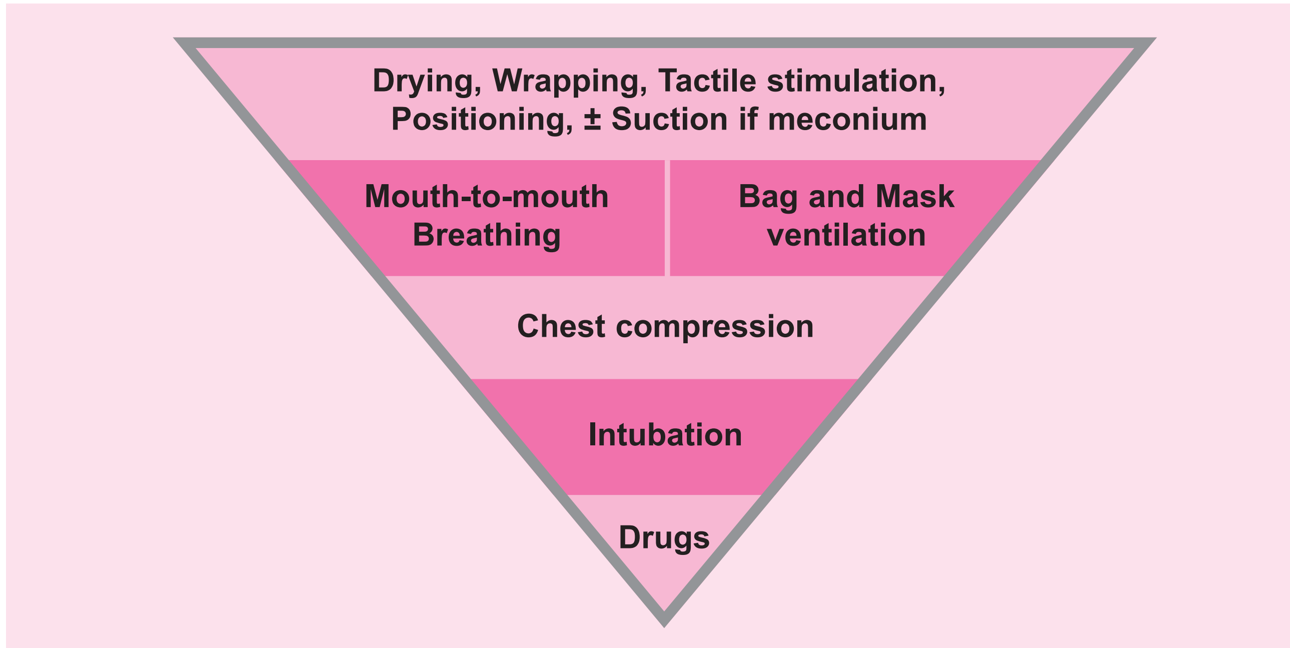
Level	Strategies and Guidelines
► At all levels	► Increase availability of trained health personnel at birth, including CSBAs, nurse midwives, midwife cadres and increase their coverage of home and facility deliveries ► Strengthen the linkage between communities and facilities to improve referral services ► Establish GoB-NGO partnership/collaboration to improve community and union level maternal and neonatal services ► Develop and implement a comprehensive and integrated BCC plan to improve awareness and behaviors related to ENC, including maternal and neonatal danger signs (see below).
► Home and community level	► Raise awareness about risk factors and harmful practices those contributing to birth asphyxia, ► Orient family members in early recognition of birth asphyxia ► Train FWA, Female HA, CSBA and CHWs on recognition, first line management and appropriate referral of neonates following birth asphyxia ► In case of eclampsia 1st dose of magnesium sulfate can be given by CSBA at community level and patient referred to EmOC facility
► Union and Upazilla levels	► The strategic aims and guidelines for management of birth asphyxia are designed to reduce the impact of birth asphyxia on overall neonatal mortality, by reducing risk factors and ensuring adequate initial management of neonates with difficulty initiating breathing. ► Increase capacity for provision of expanded interventions for maternal conditions increasing risk of birth asphyxia (e.g. identification and treatment of bacteriuria, management of preterm deliveries, management of eclampsia, screening and management of risk diseases, presumptive treatment for malaria)
► District level and above	► Increase capacity for management of obstetric complications contributing to birth asphyxia ► Increase capacity for management of neonates with post-asphyxia complications

3.2 Guidelines for Birth Asphyxia Interventions

Interventions	Guidelines and Activities
Increase awareness of risk factors and preventive measures to reduce birth asphyxia and its consequences	► Promote ENC at all levels ► Promote delayed age at first pregnancy, increased birth spacing, use of antenatal iron/folate, avoidance of harmful practices such as inappropriate oxytocin use ► Promote complete ANC, birth preparedness and awareness of maternal and neonatal danger signs. ► Depending on level of care, include the following: – Use partograph during labor at upazila and above level – Use of corticosteriods for pre-term birth – Magnesium sulfate for management of eclampsia – Appropriate management of breech delivery (external cephalic version after 37 weeks, possible C-section) – Consider labor induction after 41 weeks – Calcium supplementation for prevention of pre-eclampsia to be explored
Increase capacity for identification of birth asphyxia at all levels	► All health workers and birth attendants should be able to recognize signs of birth asphyxia
Increase capacity for immediate management of asphyxia	► The following should be done to help initiate breathing: – Drying and wrapping, tactile stimulation – Ensuring open airway: position baby in neutral position (the neck should be neither flexed nor extended) by placing a rolled piece of cloth about 2cm (1 inch) thick beneath the shoulder so that the face is in line with the body – If secretions, blood or meconium are present, use gentle suction (routine suction not required) ► Resuscitation should be performed as follows: – Community level resuscitation: Mouth-to-mouth – Facility level resuscitation: • Bag and mask • Chest Compression • Drugs ► Parents should receive counseling if their child had difficulty with initiating breathing or needs resuscitation
Improve post-resuscitation referral and management	► All community level resuscitated neonates should be referred for facility-based care ► Facility care includes close follow-up ► All district facilities should have improved maternal and neonatal care with special neonatal care units at district hospitals; with an adequate backup support through neonatal and maternal intensive care units (NICU & MICU) at Medical College Hospitals and tertiary level institutes

3.3 Management of Birth Asphyxia

3.3.1 Invertogram for Neonatal Resuscitation



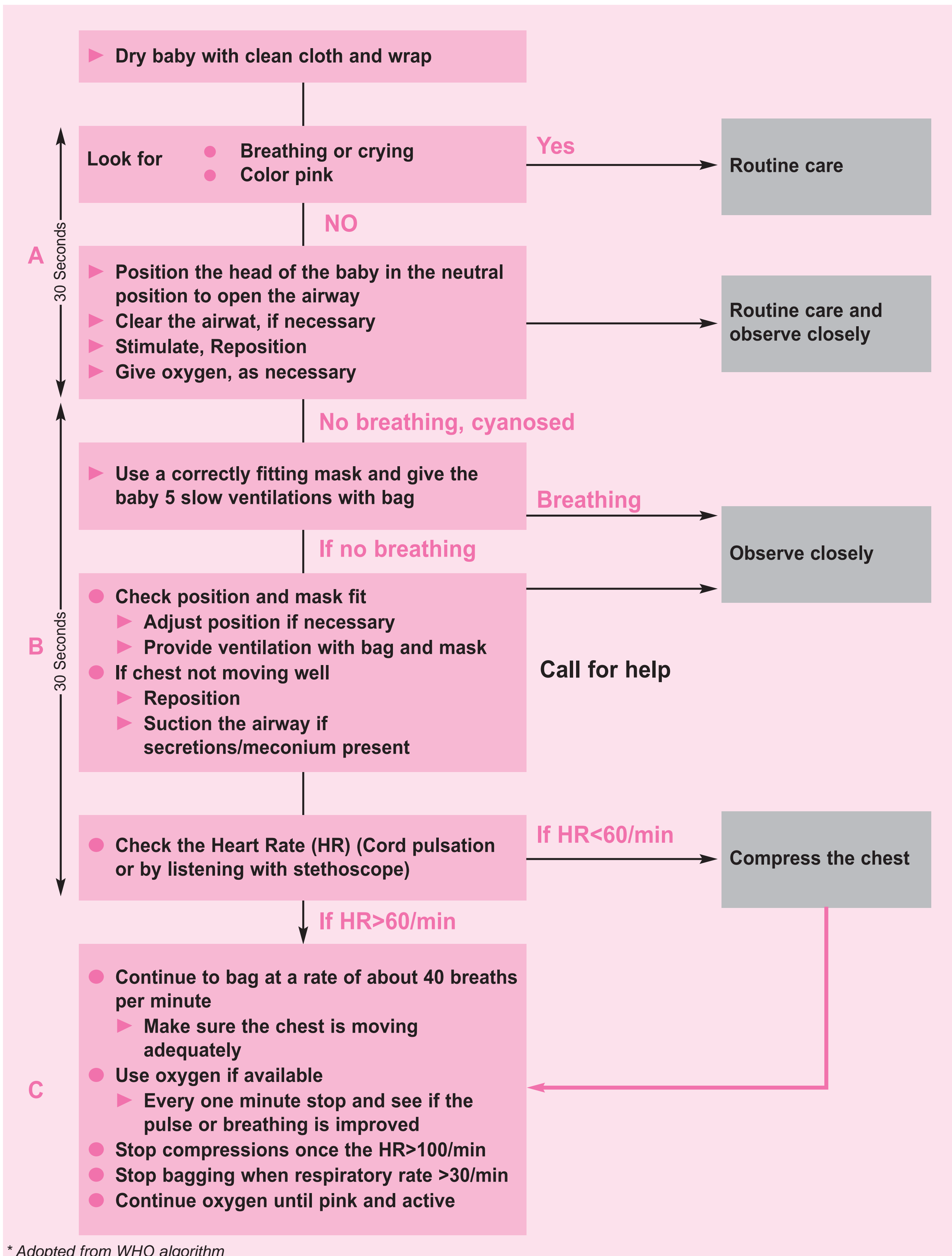
Section II

3.3.2 Management of Birth Asphyxia

Intervention	Guidelines and Activities
► Preparation for Managing Birth Asphyxia	► Warm, well lighted and draught-free room ► Clean flat surface to place the baby on ► Soap, water for hand washing ► Two clean, warm and dry cloths for cleaning and wrapping the baby; one piece of smaller cloth rolled up to 1" thick, to place under the shoulder (often provided by family) ► Pieces of clean gauze ► Sterile blade or scissors, Sterile cord ties, ► Clock with second
► Immediate care: should not take more than 60 seconds	**All these process should not take more than 60 seconds** ► Drying and wrapping ► Tactile stimulation is given, if no response (Tactile stimulation is given by rubbing the back gently) ► Position baby in neutral position to ensure open airway (the neck should be neither flexed nor extended) ► Bag & Mask/Mouth to mouth resuscitation If by this time, the baby has started to breathe normally- no further action needs to be taken.

Intervention	Guidelines and Activities
► Principles of resuscitation	**Follow ABCD principles:** A- Patent airway B- Initiate breathing C- Maintain circulation D- Drugs **Additional components are** E- Environment (keep baby warm) F- Family (counseling)
► Mouth-to-mouth resuscitation	► Clean the baby's mouth with gauze piece ► Open the mouth ► Place a dry gauze over mouth ► Block the nose ► Blow air into mouth (Nose can also be included in this procedure in which case the nose is not blocked) ► Assess chest movement - If chest moves: Continue mouth to mouth breathing - If chest does not move: Reposition and wipe out mouth with gauze, again blow air into mouth
► Bag and mask resuscitation	► To be carried out at facility level following the Algorithm for Birth Asphyxia
► Chest Compression	► Grip the baby's chest with both hands placing the thumbs on the sternum or by index and middle fingers just below an imaginary line between the two nipples ► Compress the chest ½ - ¾inchs & rapidly release: - Provide- 3 compression - 1 breath (1 CPR cycle), provided 3 CPR cycles ► Assess heart rate: - If 100 beats/min or more, stop cardiac massage and continue bagging at about 40 breaths/minute until breathing is regular and spontaneous - If heart rate is less than 60 beats/min, give another three cycles of chest compression and check each step again

3.4 Algorithm for Birth Asphyxia Management*



Adopted from WHO algorithm

3.4.1 Drugs Used in Neonatal Resuscitation

Before initiating drug treatment, check the following

- Whether the airway is open?
- Whether the chest inflates with inflation breaths?
- Whether cardiac massage is given properly?

If the newborn does not respond even after the airway is open, the chest moves easily with inflation breaths, and effective cardiac massage has been given, then drugs may help.

- **Injectable adrenaline 1:1000**: 1ml mixed with 9 ml of distilled water to make a 1:10,000 dilution. Give 0.1-0.3 ml/kg IV

Additional Drugs:

- **Injectable dextrose 10%**: Give 2-4 ml/kg IV
- **Injectable naloxone 0.4mg/ml**: Give 0.5ml/kg- if labouring mother received opiate within 4 hours of delivery

3.4.2 Harmful Resuscitation Practices

Avoid following Harmful resuscitation practices

- Slapping the baby on the back
- Hanging upside down by the feet
- Milking the cord
- Routine suction of baby's mouth and nose
- Throwing cold water on the baby's face & body
- Giving injections of respiratory stimulus
- Blowing into the ears and nose
- Stimulating the anus
- Squeezing the rib cage
- Heating the placenta
- Dipping the baby's cord alternatively in hot and cold water
- Bending the legs on the abdomen
- Keeping the placenta & cord attached for long time, till baby cries

4. Guidelines for Low Birth Weight Neonates

The strategic aims and guidelines for management of low birth weight are designed to improve the outcomes for LBW infants, by providing guidance for limiting risk factors for LBW, increasing attention to these higher risk infants, and improving management of conditions that disproportionately affect LBW infants.

4.1 Broad Strategic Actions by Level of Care

Level	Strategies
▶ At all levels	▶ All newborn attendants should be trained on ENC including special care of LBW
▶ Home and community level	▶ Weighing all neonates within 2-3 days ▶ Raise awareness of risks for LBW, by expanding educational efforts for adolescent girls and pregnant women ▶ Increase attendance at birth of a trained newborn care giver. Increase home visits by trained provider following delivery
▶ Union and Upazilla levels	▶ Expand services provided to mothers that directly reduce risk of having a LBW infant ▶ Increase community outreach and facility services designed to provide special care to LBW infants designed to reduce the risk of mortality
▶ District level and above	▶ Support lower level workers by providing supervision to improve service delivery for LBW infants ▶ Strengthen capacity for management of very LBW infants through improved facility care

4.2. Guidelines for Low Birth Weight interventions

Intervention	Guidelines and activities
▶ Weighing all neonates	▶ Include weighing of neonates for all early (within 72 hours) visits by CHWs and other health workers[5] ▶ All CHWs record birth weight, and age at which weight is taken ▶ Salter or equivalent standard spring scale can be used
▶ Identification and management of LBW neonates at all levels	▶ Increase the frequency of visits to identified LBW infants to 3 visits within 1st week of life (Day 1,3,7), followed by visits at approximately 10, 15 and 28 days old ▶ Management by level of care and severity of LBW (see below)
▶ Expanding education services for adolescents and mothers to reduce the risks related to LBW	▶ Pre-pregnancy messages outlined in table 1.2.1 provided by all levels of health workers ▶ Education messages (and health curricula) for adolescent girls include information on the neonatal consequences of early or late pregnancy, high parity, short birth interval and other risk factors for LBW ▶ Nutrition services to reduce maternal undernutrition expanded ▶ Inclusion of LBW and IUGR in anti-smoking messages
▶ Strengthening interventions for adolescents and mothers that directly relate to risk for LBW	▶ Focused ANC visits ▶ Iron/folate for adolescent girls and pregnant women, screening of pregnant women for bacteriuria and treatment of positive cases per ANC guidelines
▶ Expanding focused nutritional interventions for vulnerable groups, especially in food insecure areas	▶ Nutritional supplementation for selected high risk mothers

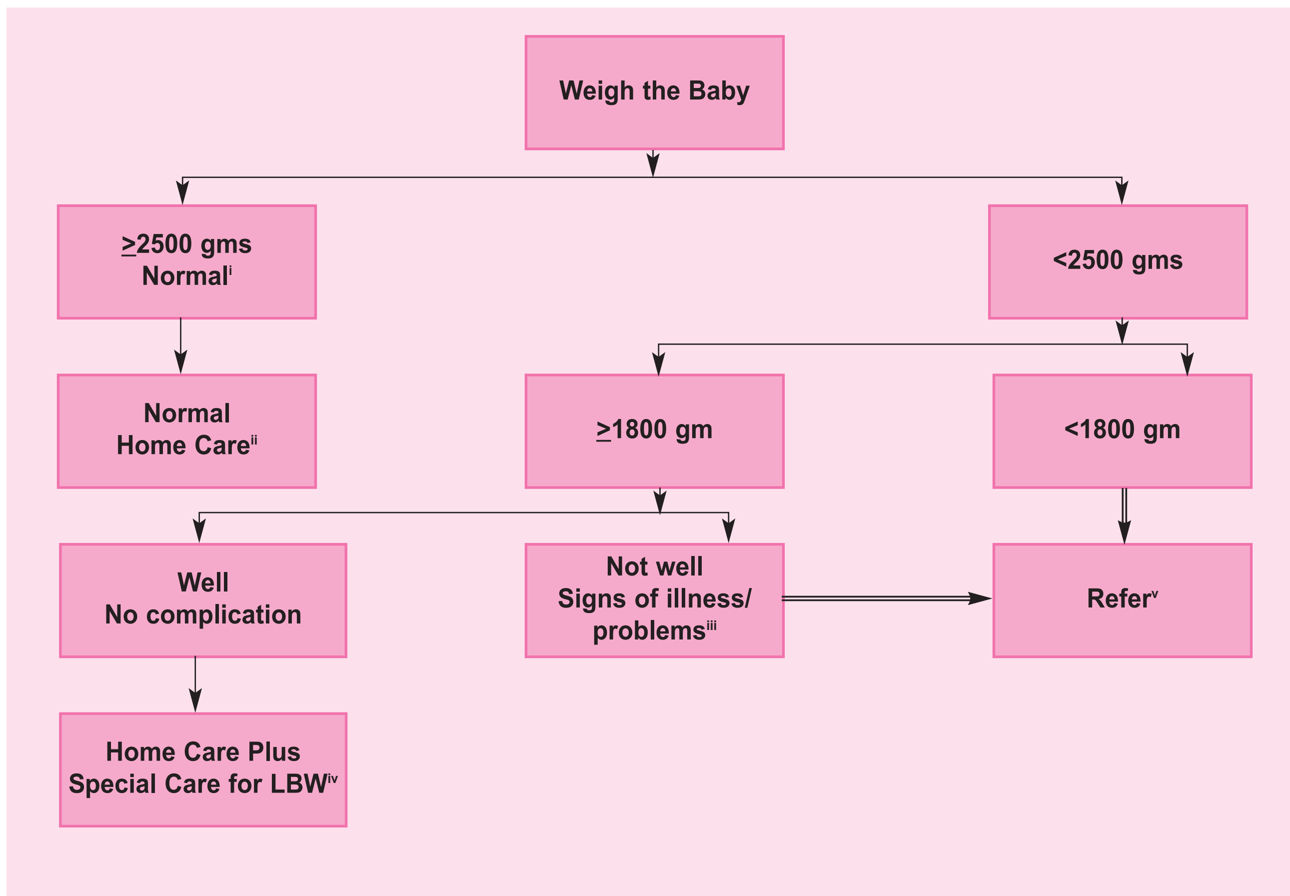
5 Note that mothers' assessment may be adequate to identify LBW in the absence of weighing

4.3. Guidelines by Level of care for Low Birth Weight Neonates

Level of care	Type of care guideline
▶ Home and Community level	**Prevention of hypothermia:** ▶ Keep baby clean, dry & warm ▶ Delay bathing ▶ Practice skin-to-skin care and proper wrapping **Feeding for stable LBW newborn** (wt >1800 gm, >34 week): ▶ Put baby on mother's breast immediately but not later than 1 hour of birth ▶ Feed on demand (at least 8 times in 24 hours, day & night) **Feeding for sick or smaller newborn:** ▶ Feeding expressed Breast milk by cup and spoon and if not possible refer ▶ Refer to a facility with newborn services **Prevention of infection:** ▶ Hand wash each time before touching the baby ▶ Do not overcrowd baby's room ▶ Minimum handling ▶ Ensure exclusive breast feeding ▶ Healthy skin, cord & eye care **Treatment of infection:** ▶ Minor infections (eye, skin, umbilicus) can be treated at home by local antiseptics / antibiotics ▶ Appropriate referral for possible severe bacterial infections
▶ Union level	**Same as home level**
▶ Upazilla level	**Prevention of hypothermia:** ▶ Baby should be dried and wrapped properly immediately after birth (for inborn babies) ▶ More stable babies can be dressed in clothes and caps and covered with blankets ▶ Keep the room warm with heater ▶ Warm cot can be used ▶ Skin-to-skin care **Feeding for stable LBW newborn** (wt >1800 gm, >34 week): ▶ Put to the breast immediately and no later than 1 hour after birth ▶ Feed on demand (at least 8 times in 24 hours, day & night) ▶ Feed breast milk by cup and spoon **Feeding for sick or smaller newborn:** ▶ Naso-gastric feeding with expressed breast milk. ▶ NPO with intravenous fluid if abdominal distension exists If above service is not available, refer to higher health facility

Level of care	Type of care guideline
	IV fluid infusion (day 1-2): ▶ Dextrose (5-10%) in aqua **IV fluid infusion (>day 2):** ▶ Dextrose (5-10%) in 0.225% saline Above if service available, otherwise refer to higher health facility
	Prevention of infection: ▶ Minimum handling ▶ Follow strict aseptic techniques, especially hand washing, before handling the baby ▶ Barrier nursing ▶ Meticulous skin care ▶ Early identification and treatment with antibiotic or refer to higher centre/facility if not improving
	Treatment of infection: ▶ Clinical monitoring and follow up ▶ Prompt treatment with injectable antibiotic if any one or more signs are detected, ▶ Refer to higher centre with first dose of antibiotic, if service is not available
▶ District and tertiary care level	**Prevention of hypothermia:** ▶ All measures of upazilla level plus ▶ Use incubator when available, kept at an appropriate temperature (Usually 32-35o C with humidity 50%)
	Feeding for stable LBW newborn (wt >1800 gm, >34 week): ▶ Put to the breast immediately and feed on demand ▶ Feed breastmilk by cup and spoon
	Feeding for sick or smaller newborn: ▶ Feeding with breast milk (gradually increasing the volume) ▶ Intravenous fluid (if needed keep neonate nothing per oral)
	IV fluid infusion (day 1-2): ▶ Dextrose (5-10%) in aqua **IV fluid infusion (day >day 2):** ▶ Dextrose (5-10%) in 0.225% saline
	Prevention of infection: All measures of upazilla level plus ▶ Early identification of infection and treatment of infection with antibiotic
	Treatment of infection: All measures of upazilla level plus ▶ Prompt treatment with injectable antibiotic if any one or more of signs are detected

4.4. Algorithm for Follow Up of LBW Babies at Home



i. A Normal, well and thriving baby is:

- Of good color (pink)
- Breathing calmly & quiet (no severe chest in drawing, RR <60/min)
- Suckling breast effectively
- Empties bladder normally
- Moves bowels normally (0-several times per day, soft, no blood)
- Not too hot, not too cold
- Active
- Looks happy and well

ii. Home care:

- Hand washing each time before touching baby / clean mother / clean, warm and dry baby
- Initiate breastfeeding immediately after birth and no later than 1 hour, ensure exclusive breastfeeding for 6 months
- Minimal handling
- Do not overcrowd baby's room
- Do not allow any infected/sick person in baby's room
- Watch for signs of sickness / illness

iii. Not well / signs of illness / problems:

- Color off, bluish, mottled, yellow, pale
- Lethargic
- Breathing fast or labored (severe chest indrawing & / or RR ?60/min)
- Reluctant to feed / no attachment at all / not suckling well
- Vomiting
- Urine not passed
- Eyes with pus or discharge
- Belly distended
- Red skin around umbilical stump / foul smelling discharge
- Many skin pustules, any large abscess
- Too hot / cold skin (fever or hypothermia)
- Obvious congenital anomaly present
- Premature rupture of membrane (prom) >18 hours
- Bad obstetric history (IUD, previous neonatal death, unexplained infant death)
- Rh negative mother
- Bleeding manifestation

iv. Special care for LBW:

- Home care, plus
- Start following supplements at 2 wks of age
  - Multivitamin pediatric drops
  - Folic acid
  - Iron pediatric drop
- Give mother vitamins and extra nutritious foods (baby gets it through breast milk)
- Help mother taking adequate rest, to take care of baby
- Weigh baby and plot on chart monthly to follow if gaining wt satisfactorily

v. Refer:

- Give first dose of antibiotic for suspected sepsis
- Contact the referral centre beforehand if possible
- Counsel parents / care giver how to keep baby warm and prevent low blood glucose on the way to referred centre

5. Guidelines and Interventions for Neonatal Sepsis

With sepsis contributing to a third of neonatal deaths, the Strategy aims to reduce risk factors associated with sepsis, increase early recognition of sepsis, and ensure quality care for potentially septic neonates.

5.1. Broad Strategic Actions by Level of Care

Level	Strategies
▶ At all levels	▶ Develop CHWs' capacity to classify and manage neonatal infections
▶ Home and community level	▶ Raise awareness of families and communities on risk of infections, and promote practices to reduce risk and promote timely care-seeking for illness ▶ Raise mother and community awareness of danger signs for infection, and improve self-referral for early infection management ▶ CHWs and lower level (non-physician) health workers will follow the sepsis algorithm to classify and manage neonatal sepsis
▶ Union and Upazilla levels	▶ Develop and strengthen facilities for management of newborn infections, including treatment and/or upward referral of sick newborns with danger signs ▶ Strengthen staff capacity to recognize sick newborns and treat appropriately according to protocols
▶ District level and above	▶ Offer comprehensive newborn care services with proper diagnosis and management of sick newborns ▶ Physician or skilled health worker judgment in conjunction with more complete examination and available laboratory assessment is needed to make a firm diagnosis of sepsis.

5.2. Guidelines for Neonatal Sepsis interventions

Intervention	Guidelines and Activities
▶ Home visit to increase awareness and promote Essential Newborn Care	▶ Use standardized messages and interventions included in ENC package ▶ Educate mothers on increased sepsis risk among LBW infants
▶ Establishment of a birth and death registration system	▶ All CHWs record births in register, and include 2 month follow-up visit, recording status of neonate at that time. ▶ All deaths < 28 days recorded in CHW register (either through home visit, or by family reporting death)

Section II

Intervention	Guidelines and Activities
► Expansion of Community-based IMCI to include the entire neonatal period	► Develop integrated package of services that can be included with the scaling up of C-IMCI ► Revise IMCI materials to include Neonatal Health Strategy interventions to scale up C-IMNCI program ► Health workers provide ANC and PNC as per guidelines
► Evaluation of the role of all levels of health workers in providing improved maternal and neonatal care-including sepsis management	► Review roles of existing cadres of workers in provision of maternal and neonatal interventions, with a focus on filling the gap in community-based service delivery, particularly for identification and management of sepsis ► At community level: – Apply results of operations research on community management of sepsis (see below) ► At facility (union level: UH&FWC and Union subcentre): – Link up with upazilla and district level facilities for referral of sick babies – Ensure safe and rapid transport with thermal protection, breathing stabilization, and continued supportive care on the way to a facility providing an appropriate level of neonatal care – Support CHWs in their home-based management of neonatal infections ► At Upazila level facility (UHC): – Manage newborn infections with appropriate antibiotics. – Link up with district and above Level facilities of care for referral of appropriate cases of sick newborns
► Strengthening the link between maternal health and neonatal health programs	► Evaluate models for linkage of postnatal newborn care, including sepsis management, with maternal health programs ► Develop a standard package of care for sepsis that can be provided through an integration of services delivered by different Ministry sectors
► Initiation of community-based operations research to improve the management of neonatal infections	► Initiate operations research on CHW classification of neonates as having possible severe bacterial infection (likely sepsis) based on an algorithm, and provide guidelines for initial treatment and referral: – CHW (HA and/or FWA and possibly NGO CHWs) management of sepsis, including use of oral drugs, home-based IM injections (penicillin or gentamicin), consistent with IMCI guidelines ► Assess optimal treatment regimens and antibiotic delivery mechanisms for different levels of care
► Strengthening community mobilization for management of sepsis	► Evaluate approaches to community mobilization for promotion of effective linkages between community and facilities to improve management of neonatal infections.

5.3. Management of Neonatal Sepsis

5.3.1 Algorithm for Management of Neonatal Sepsis for Home, Community and Union Level Facilities (Community Clinic/UH&FWC/union sub-centre)

Assess the baby for possible sepsis	Signs	Classify as	Treatment
ASK: ▶ Is the baby able to feed? ▶ History of convulsion **LOOK, LISTEN, FEEL: (Note: Newborn baby must be calm to assess breathing)** ▶ Look for convulsion ▶ Count the breaths in one minute Repeat the count if increased (i.e.60 /min or more) ▶ Look for severe chest in-drawing ▶ Measure axillary temperature (for 3 minutes) ▶ Look at the newborn baby's movements. If infant is sleeping, ask the mother to wake him/her. ▶ Does the infant move on his/her own? If the infant is not moving, gently stimulate him/her. ▶ Does the infant move only when stimulated but then stops? ▶ Does the infant not move at all?	**One of the following signs -** ▶ Not feeding well* ▶ Convulsions* ▶ Fast breathing (≥60 breath/min on second count) ▶ Severe chest indrawing ▶ Low body temperature (less than 35.5°C or 95.9°F) ▶ Fever (more than 37.5 °C or 99.5°F) ▶ Movement only when stimulated or no movement at all	**Possible sepsis**	**If there is one or more signs:** ▶ Give first dose of intramuscular antibiotics: injectable Gentamicin (5 mg/kg) AND ● oral Amoxicillin (50 mg/kg) OR ● oral Cotrimoxazole (5 mg/kg) ▶ Treat to prevent low blood sugar: Ensure proper feeding ▶ Refer urgently to a hospital ● If able to take feed continue feeding ● Advise to keep the baby warm by skin to skin contact on the way to the hospital. **If referral fails** ▶ follow up the baby and continue treatment at home: injection Gentamicin (5 mg/kg/day in single dose for total 7 days) AND oral Amoxicillin (50 mg/kg/dose twice daily for total 7 days) OR oral Cotrimoxazole (5 mg/kg/dose twice daily for total 7 days) ▶ counsel the mother for referral if sign persists ▶ inform the supervisor for the failed referral

* based on history and assessment,

5.3.2 Algorithm for Management of Neonatal Sepsis for facilities (UHC/DH/MCWC/MCHs)

Assess the baby for possible sepsis	Signs	Classify as	Treatment
ASK: ▶ Is the baby able to feed? ▶ History of convulsion **LOOK, LISTEN, FEEL: (Note: Newborn baby must be calm to assess breathing)** ▶ Look for convulsion ▶ Count the breaths in one minute Repeat the count if increased (i.e.60 /min or more) ▶ Look for severe chest in-drawing ▶ Measure axillary temperature (for 3 minutes) ▶ Look at the newborn baby's movements. If infant is sleeping, ask the mother to wake him/her. ▶ Does the infant move on his/her own? If the infant is not moving, gently stimulate him/her. ▶ Does the infant move only when stimulated but then stops? ▶ Does the infant not move at all?	▶ Not feeding well* ▶ Convulsions* ▶ Fast breathing (≥60 breath/min on second count) ▶ Severe chest indrawing ▶ Low body temperature (less than 35.5ºC or 95.9ºF) ▶ Fever (more than 37.5 ºC or 99.5ºF) ▶ Movement only when stimulated or no movement at all	**Possible sepsis**	**IF THERE IS ONE OR MORE SIGNS:** **First line treatment:** ▶ Inj. Gentamicin I/V or I/M (5 mg/kg/day in single dose for 7 days) plus: ● Inj. Ampicillin I/V or I/M (50 mg/kg/dose twice daily) for 7 days or ● Inj. Procaine penicillin I/M (50,000 unit/kg as single daily for 7 days) or ● Inj. Benzylpenicillin I/M (50,000 unit/kg/dose 6 hourly for 7 days) **Second line treatment:** ▶ Inj Ceftazidim / Cefotaxime I/V or I/M (50 mg/kg/dose twice daily for 7 days) plus: ▶ Inj. Amikacin I/V or I/M (7.5 mg/kg/dose twice daily for 7 days)

* based on history and assessment,

5.4 Identification of Neonatal Sepsis: Danger Signs[7]

Potentially sick neonates should be identified by mothers or family members based on the neonatal danger signs for sepsis (see below). These danger signs require no equipment, and are designed to increase the likelihood that mothers seek early care for sick neonates.

- Not feeding well
- Convulsions
- Fast breathing (≥60 breath/min on second count)
- Severe chest indrawing
- Low body temperature (less than 35.5ºC or 95.9ºF)
- Fever (more than 37.5 ºC or 99.5ºF)
- Movement only when stimulated or no movement at all

7 The Young infants Clinical Signs Study Group. Clinical signs that predict severe illness in children under age 2 months: a multicentre study. Lancet 2008;371(9607) 135-142.

6. Guidelines for Supervision, Monitoring and Evaluation of Neonatal Health Care

A comprehensive monitoring and evaluation plan, including indicators for measuring progress have to developed considering the existing information and monitoring systems for maternal and child health.

Appropriate systems need to be developed to ensure data quality, processing and optimum use for decision-making. Supervision is critical to support implementation, ensure that standards of care are met, and to build capacity at various levels. Operations research will provide information about new approaches, which will then be modified and incorporated into the overall Strategy.

6.1. Supervision by level of care

Level	Broad Strategies	Activities for Supervisory Consideration
▶ At all level	▶ Establish supportive supervision and continuous professional improvement process	▶ Establish supportive supervision and continuous professional improvement process
▶ At home and community level	▶ Early identification of pregnancies and tracking them until births and postnatal period ▶ Ensure presence of a skilled provider during labor and postnatal visits for newborn	▶ Identify standards for each of the service components by level ▶ Use of simple checklists may be a good bridging approach to synchronize actual practices with the set standards of quality. ▶ On-site observation by first line supervisors should be included. ▶ Perinatal death audits should be considered an on-going activity to review and understand preventable factors for newborn deaths.
▶ At facility	▶ Utilization of facilities to the confidence of the clientele. ▶ Ensure availability and quality of care especially human aspect of service delivery, regularly supervised. ▶ Supervision should focus neonatal service delivery with attention to sick newborn	▶ Standards for quality services should be an essential part of all training curriculums, ▶ Standards for services are displayed for clients attending any facility. ▶ Supervisory findings from field and facility need to be shared during the monthly meetings. ▶ Validation of assessment of a sample of the community-based workers at the out patient department should be an on-going activity

6.2. Monitoring Indicators

A comprehensive monitoring and evaluation plan with defined objectives and illustrative core indicators will be developed as a part of the action plan. The monitoring system for the Neonatal Health Strategy would ensure adequate information available to measure progress with all program components, help managers/supervisors tracking performance and progress and ultimately provide adequate evidence for achieving ultimate goal of the strategy.

Indicators

This strategy calls for regular tracking of progress using three types of measures:

- **Measures of service delivery:** including input and output indicators - for understanding how well activities are being implemented on the ground.
- **Measures of coverage:** to determine how well programs are reaching the population, including the most vulnerable
- **Measures of impact:** including indicators measuring morbidity (including low birth weight) and mortality - for periodic evaluation of progress toward MDG 4 targets

Indicators for monitoring the integrated maternal, neonatal and child health program need to be defined in a coordinated manner. A detailed list of indicators entailing impact, outcome and process levels will be developed as part of a comprehensive monitoring and evaluation plan. The following tables highlight general indicators for delivery of services (input and expected outcomes) and impact for neonatal interventions.

Table 1: Illustrative input indicators

<table>
<tr><th>Indicator</th><th>Level of Monitoring</th><th>Data Source/ Frequency</th></tr>
<tr><td colspan="3">Budget and finance</td></tr>
<tr><td>Costed national plan for ensuring universal access to newborn interventions available</td><td>National</td><td>MOH&FW</td></tr>
<tr><td colspan="3">Policies and standards</td></tr>
<tr><td>Proportion of key technical policies and guidelines adopted and being used. Key technical policies and guidelines include:
1. IMCI updated to include management of sick newborn
2. Standards for newborn care including newborn resuscitation and ENC that have been reviewed and updated in the previous 2 years
3. Essential newborn drugs list available
4. Community-based management of sick newborns
5. Financial protection of newborns and mothers</td><td>National</td><td>DGHS, DGFP</td></tr>
<tr><td colspan="3">Capacity building</td></tr>
<tr><td>Number & proportion of medical, nursing or other health worker training schools giving pre-service training in ENC</td><td rowspan="5">National, Divisional, District</td><td rowspan="5">MOH&FW, DGHS, DGFP</td></tr>
<tr><td>Number & proportion of planned ENC & IMCI trainings for facility-based health workers conducted in the previous year</td></tr>
<tr><td>Number & proportion of planned ENC trainings for community-based health workers conducted in the previous year</td></tr>
<tr><td>Number & proportion of planned staffs trained on ENC & IMCI training</td></tr>
<tr><td>Number & proportion of planned staffs trained on BEmONC/CEmONC</td></tr>
<tr><td colspan="3">Facility preparedness & functioning</td></tr>
<tr><td>Proportion of first level facilities OPDs equiped with essential supplies/medicine for management of sick newborn</td><td rowspan="2">National, Divisional, District, Upazilla</td><td rowspan="2">MOH&FW, DGHS, DGFP</td></tr>
<tr><td>Proportion of first level OPDs with with trained staffs for sick newborn management</td></tr>
</table>

Indicator	Level of Monitoring	Data Source/ Frequency
Proportion of facilities with in-patient services equiped with essential equipments & supplies/medicine for management of sick newborn	National, Divisional, District, Upazilla	MOH&FW, DGHS, DGFP
Proportion of facilities with in-patient services have functioning BEmONC/CEmONC		

These inputs should result in measurable outcomes at a variety of levels. Table 2 summarizes some of the potential output and outcome indicators by levels of monitoring.

Table 2: Output/outcome indicators

Indicator	Level of monitoring	Data source/ frequency
Pregnancy		
% of recently delivered women who received antenatal care (ANC) at least one from a qualified provider	Upazilla/Union	FWA/HA/CSBA register NGO MIS
% of recently delivered women who received antenatal care (ANC) at least four from a qualified provider		
% of recently delivered women who know at least their newborn danger signs		
Delivery		
% of recently delivered women who were assisted by a skilled birth attendant	Upazilla/Union	FWA/HA/CSBA register NGO MIS
% of recently delivered women who delivered in a facility		
Postpartum		
% of live born newborns weighted within 24 hours within 3 days of birth	Upazilla/Union	*FWA/HA/CSBA register NGO MIS
% of live born newborns wiped, wrapped immediately (within 5 minutes) of ten birth		
% of live born newborns whose bath were delayed by 3 days		
% of live born newborns received dry cord		
% of live born newborns who were fed colustrum		
% of live born newborns who were initiated on breastfeeding within 1 hour of birth		
% of live born newborns who received postpartum from a qualified provider within 1-3 days of birth		
% of sick newborns managed by a qualified provider		
% of sick newborns received appropriate antibiotic		

In order to monitor progress towards achieving MDGs, some impact indicators require population-based representative surveys like DHS. Efforts should be made to work with DHS to incorporate newborn indicators to monitor impact indicators. If data quality can be assured, the vital registration system and routine MIS figures may complement national survey findings.

Table 3: **Impact indicators**

Indicator	Level of monitoring	Data source/ frequency
Neonatal mortality rate	National, divisional, district and upazilla	DHS, MIS
Neonatal mortality as a proportion of infant and under-5 mortality		DHS, MIS
Proportional cause of newborn mortality		Verbal autopsy
Low birth weight rate		MIS

7. Annexes

Annex 1: Human Resources for Maternal and Neonatal Health Service Delivery (not exhaustive)

Intervention by continuum of care	Health worker
Pre-pregnancy	
▶ Education for risk factors	FWA, HA , CSBA, FWV, MA, SACMO, CNP & CNO and similar NGO workers
▶ Screening for risk conditions	
▶ Preventive measures	
ANC	
Community/home ANC	
▶ Registration of pregnant women	FWA, HA , CSBA, CNP, CNO, FWV, MA, SACMO and similar NGO workers
▶ Education for birth neonatal and emergency preparedness (BNEP)	
▶ Nutrition and health education	
▶ Education on maternal and neonatal danger signs and referral	
▶ Management and referral for other risk diseases	
▶ Preventive measures	
ANC at facility level	
All above plus	SSN, FWV, MA, SACMO, MO
▶ Examination and assessment for obstetric risk	
▶ Immunization	
▶ Screening and treatment for risk diseases	
▶ Voluntary counseling and testing for HIV	
▶ Preventive measures	

Intervention by continuum of care	Health worker
Delivery care and ENC	
Community/home delivery care and ENC	
▶ Presence of skilled birth attendant at all births ▶ Presence of trained newborn attendant at delivery to assess newborn ▶ ENC ▶ Maternal counseling	FWA, HA , CSBA, CNP, CNO, FWV, MA, SACMO and similar NGO workers
Facility level delivery care and ENC	
All above plus ▶ Emergency obstetric care for complications ▶ Antibiotics for premature rupture of membranes ▶ Management of neonatal complications ▶ Prevention of mother-to-child transmission of HIV	SSN, FWV, MA, SACMO, MO
PNC	
Community/home PNC	
▶ Birth registration ▶ Weighing, feeding, temperature management and cord care ▶ Assessment and initiation of care for sepsis, and referral ▶ Assessment and management of LBW ▶ Counseling for newborn care, including neonatal danger signs ▶ Referral for vaccination ▶ Postpartum care for mother	FWA, HA , CSBA, CNP, CNO, FWV, MA, SACMO and similar NGO workers
Facility level PNC	
All above plus ▶ Screening for congenital hypothyroidism ▶ Management of maternal complications ▶ Follow up of neonates in need of special care	SSN, FWV, MA, SACMO, MO

Annex 2: Training and orientation Packages based on level and categories

Level	Content	Providers
Orientation		
▶ Home and community levels	All must be trained in ENC,[8] management of sick newborns as per approved guideline	FWA, HA, CSBA, CNP and trained CHWs of NGO
▶ Outreach center, satellite clinic and community clinic level	All must be trained in ENC and management of complications/sick newborns	FWA, HA, CSBA and FWVs
▶ Union facility level	All must be trained in ENC and basic obstetric care and management of complications	MO, MAs, SACMO, FWVs
▶ Upazila level (UHC, NGO/private clinic)	Higher level of skills to manage incoming referral and emergency obstetric & newborn care	MO, SSN, MAs, specialists (obstetrics, paediatrics)
▶ District level (DH/MCWC/private clinic etc.)	Higher level of skills to manage obstetric and neonatal complications and perform emergency obstetric & newborn care	MO, SSN (NICU trained, midwifery trained), FWV (EmOC trained), specialists (obs/gynae, paediatrician, neonatologist)
▶ Tertiary level (medical college, institute)	Highest level of skills to manage incoming referral	MO, SSN (NICU trained, midwifery trained), specialists (obs/gynae, paediatrician, neonatologist)

Annex 3: Logistics and Drugs for Neonatal Management by Level

Table 1: Home and community level (supplies for CHW)

Item (quantity)	Specifications	Use	Rationale
Scale (1)	Salter scale up to 50 gm accuracy (colour coded) Or Birth weight indicator, Qualitative, color coded	To weigh newborn	Weighing newborn routinely and identify low birth weight babies for extra care
Tetracycline ointment (4 tubes)	Tetracycline eye ointment 1%	Prevention and treatment of eye infection	Tetracycline is recommended for treatment of bacterial conjunctivitis and prevention of secondary infection due to viral conjunctivitis
Thermometer (1)		Measures body temperature, identify fever and hypothermia	Timely recognition of changing of body temperature, both hyper and hypothermia is important to identify infection and other newborn complications

8 See Section 2.2 on ENC interventions

Item x quantity	Specifications	Use	Rationale
ARI timer (1)	Battery lasts for at least 2 years Water resistant	Count breathing rate to identify pneumonia	Early identification and management of pneumonia
BCC materials including leaflet on normal & LBW care and newborn danger signs (1)	Pictorial material to show major newborn danger signs, correct treatment and when to refer	To assist CHWs recognizing newborn danger signs	Serve as a reference to CHWs for timely and proper recognition, management, and referral
Towel (2)	Cotton, white, 100cm x 100cm	To dry newborns and keep warm	Newborn can lose body heat quickly if not dried immediately
Paediatric cotrimoxazole (tablets, 2 treatment courses)		To treat pneumonia, initial treatment for presumed sepsis	Need early initiation of treatment

Annex 4: Description of Neonatal Supplies for Health Facility

General supplies (quantity)	Resuscitation equipment
▶ Scale (1) ▶ Tetracycline ointment (20) ▶ Thermometer (2) ▶ ARI timer (1) ▶ Towel (10) ▶ Cups and spoons (5) ▶ Naso- gastric feeding tubes ▶ Stethoscope (infant size)	▶ Resuscitation Kit, Basic (1) ▶ Neonatal bag (250ml-500 ml) ▶ Masks (size 1 for normal weight and size 0 for small babies) ▶ Mucus extractor -DeLee suction device ▶ Feeding tube (5- 6 Fr) ▶ Endotracheal tube - 2, 2.5, 3.5, 4 ▶ Infant laryngoscope with blade (0-1) ▶ Oxygen (optional)
Other equipment	**Infusion/Injection equipment**
▶ Phototherapy machines ▶ Warmer cots ▶ Open warmer ▶ Room Heater ▶ Sterilizers	▶ I/V canulla ▶ Micropores ▶ Microburette and infusion sets ▶ Disposable syringes ▶ Butterfly needles ▶ Blood transfusion sets
Parenteral fluids	**Antibiotics**
▶ 0.225 % Normal saline +5% dextrose ▶ 0.45 % normal saline +5% dextrose ▶ 0.9 % normal saline ▶ 10% dextrose in aqua ▶ 5% dextrose in aqua ▶ Other Drugs (if necessary) – Adrenaline 1:1000 – Sodium bicarbonate 7.5% – Naloxone	▶ Tab. Paediatric Cotrimoxazole ▶ Inj. Procaine Penicillin ▶ Inj. Benzyl Penicillin ▶ Inj. Ampicillin ▶ Inj. Gentamicin ▶ Inj. Amikacin ▶ Inj. Flucloxacillin ▶ Inj. Chloramphenicol ▶ Inj. Ceftriaxone ▶ Inj. Ceftazidime

Annex 5: Broad Strategic Action Plan for Operationalzing Neonatal Health Strategy:

It is envisioned that a detail costed action plan would be developed based on the recommendations of the National Neonatal Health Strategy 2009 as a first step once the NNHS is endorsed by the MOHFW. However the following broad based action plan is being proposed which will guide in developing the detail costed action plan in a log frame manner with specific objectives & results for the period 2008-2015.

Activity/Actions/ Inputs	Year wise achievements				Responsibility	Potential partners
	2009	2010	2011	2012-15		
1. Policy & advocacy:						
Endorsement of NNHS by the MOH&FW	√				MOH&FP, DGHS, DGFP	UNICEF, WHO, UNFPA, USAID, SCF-USA, ICDDR,B, other National & International NGOs
Revision of maternal health strategy to incorporate neonatal health	√				MOH&FP, DGHS, DGFP, Professional Associations	
Policy advocacy	√				MOH&FP, DGSH, DGFP	
2. Expand Human Resources capacity:						
Modify job description of community health workers (both Public and Private)	√				MOH&FP, DGHS, DGFP	UNICEF, WHO, UNFPA, USAID, SCF-USA, ICDDR,B, other National & International NGOs
Review and Development/ revision of multi-level training materials and plan	√				MOH&FP, DGHS, DGFP, Professional Associations	
Expansion of CHW & Neonatal attendants (BHW/CSBA/CNP/ NGO workers etc.)	√	√	√		MOH&FP, DGHS, DGFP, NNP, NGOs	
TOT on ENC for the Master Trainers (National)	√				DGHS, DGFP, NNP, Professional Associations, ICMH	
TOT on ENC for the Facilitators	√				DGHS, DGFP, NNP, Professional Associations, ICMH	
ENC Training for the Doctors	√	√	√		DGHS, DGFP, NNP, Professional Associations, ICMH	
ENC Training for the Paramedics	√	√	√		DGHS, DGFP, NNP, Professional Associations, ICMH	
Orientation of Neonatal Attendants/Community Volunteers on ENC	√	√	√		DGHS, DGFP, NNP, Professional Associations, ICMH	

Activity/Actions/ Inputs	Year wise achievements				Responsibility	Potential partners
	2009	2010	2011	2012-15		
Sepsis management Training for the CHWs	√	√			DGHS, DGFP, UNICEF, SNL, ICDDR,B, BNF/BPS	UNICEF, WHO, UNFPA, USAID, SCF-USA, ICDDR,B, National & International NGOs
3. Service delivery:						
Integration of neonatal health care in to existing programme & services (EmONC, IMNCI etc.)	√	√			MOH&FW, DGHS, DGFP, NNP	UNICEF, WHO, UNFPA, SCF-USA, ICDDR,B, National & International NGOs
Upazila coverage with Neonatal Health Care package through facility, C-IMCI, NNP and other MNH programme	50	100	100	210	MOH&FW, DGHS, DGFP, NNP, NGOs	
4. Logistics supply and drugs:						
Procurement and supply of logistics as per guidelines of NNHS (CDNK, weighing scale, bag & mask etc.) to facilities and CHWs	√	√	√		MOH&FW, DGHS, DGFP, NNP, NGOs	UNICEF, WHO, UNFPA, USAID, SCF-USA, National & International NGOs
Procuement and supply of drugs (Bengyl penicillin/ Cotrimoxazole/ Amoxycillin etc. as per guidelines of NNHS) to facilities & CHWs	√	√	√		MOH&FW, DGHS, DGFP, NNP, NGOs	
5. Behaviour Change Communication:						
Formative study to identify key communication issues for neonates	√				DGHS (BHE), DGFP (IEM), UNICEF, SCF-USA	UNICEF, WHO, UNFPA, USAID, SCF-USA, ICDDR,B, National & International NGOs
Development of a comprehensive BCC plan for Neonatal Health Care	√				DGHS (BHE), DGFP (IEM), UNICEF, SCF-USA	
Review and Development of appropriate BCC advocacy/communication packages/materials	√	√			DGHS (BHE), DGFP (IEM), UNICEF, SCF-USA	
Development of comprehensive BCC plan	√				DGHS (BHE), DGFP (IEM), UNICEF, SCF-USA	
Mass media campaign on Neonatal Health Care (IPT, TV Skits, Video shows, Docu-drama etc)	√	√	√	√	DGHS (BHE), DGFP (IEM), UNICEF, SCF-USA, Media	
Development and imple-mentation of appropriate and feasible operational research on neonatal sepsis and subsequent scale -up	√	√	√		LD-ESD, LD-MCRH, UNICEF,SNL of SC-USA, ICDDR,B, BNF,BPS	

Activity/Actions/ Inputs	Year wise achievements				Responsibility	Potential partners
	2009	2010	2011	2012-15		
Operation research on innovations for scale-up essential neonatal care (Management of LBW, Birth Asphyxia etc.)	√	√	√		DGHS, DGFP, UNICEF,SNL of SC-USA, ICDDR,B, BNF,BPS	UNICEF, WHO, UNFPA, USAID, SCF-USA, ICDDR,B, National & International NGOs
Initiate and conduct planned Neonatal Vit-A feasibility model	√	√			DGHS, DGFP, UNICEF,SNL, ICDDR,B, Professional Associations	
Establish mechanism to review and plan for initiation of innovations related to neonatal care (misoprostol, chlorhexidine etc.)	√	√			DGHS, DGFP, UNICEF,SNL, ICDDR,B, Professional Associations	
6. Supervision, Monitoring and evaluation:						
Development of a comprehensive Monitoring & Evaluation Plan	√				DGHS, DGFP, UNICEF,SNL, ICDDR,B, BNF, BPS	UNICEF, WHO, UNFPA, USAID, SCF-USA, ICDDR,B, National & International NGOs
Development/re-visit MIS to incorporate neonatal component	√	√			DGHS, DGFP, UNICEF,SNL, ICDDR,B, BNF, BPS	
Forms and registers revisited/developed, printed/supplied	√	√	√	√	DGHS, DGFP, UNICEF,SNL, ICDDR,B, BNF/BPS	
Training of service providers and statisticians on MIS	√	√	√		DGHS, DGFP, UNICEF,SNL, ICDDR,B, BNF/BPS	
Review, evaluation and feedback	√	√	√	√	DGHS, DGFP, UNICEF,SNL, ICDDR,B, BNF/BPS	
7. Quality Assurance:						
SOP development for Neonatal Health care as per NNHS guidelines	√				DGHS, DGFP, UNICEF,SNL, ICDDR,B, Professional Associations	UNICEF, WHO, UNFPA, USAID, SCF-USA, ICDDR,B, National & International NGOs
Development, Printing and supply of Standard Management Protocols for Neonatal Care at facilities	√	√	√	√	DGHS, DGFP, UNICEF, SNL, ICDDR,B, Professional Associations	
Formation & training of QA Team, conduct QA Visit, Establish accreditation system of facilities providing quality neonatal care	√	√	√	√	DGHS, DGFP, UNICEF,SNL, ICDDR,B, Professional Associations	
Develop and institute Neonatal/Perinatal death audit system	√	√			DGHS, DGFP, UNICEF,SNL, ICDDR,B, Professional Associations	

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We Acknowledge the contribution of following Organizations in developing this National Neonatal Health strategy & Guidelines

Bangladesh Neonatal Forum
Bangladesh Perinatal Society
Bangladesh Paediatric Association
Obstetric & Gynaecological Society of Bangladesh
All the Members of IMCI National Working Team