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Developing, Piloting and Scaling-up of Nepal's Neonatal Care Program

Poudel DC,[1] Acharya B,[1] Pant S,[1] Paudel D,[2] Pradhan YV[3]

[1]JSI Research & Training Institute Inc., [2]United States Agency for International Development, [3]Ministry of Health and Poplation, Nepal.

ABSTRACT

The Community-based Newborn Care Package is a set of neonatal care interventions to be delivered through the existing government system of facility-based health workers and community based volunteers in Nepal. The package was developed by the government of Nepal in 2007 based on the evidence from Nepal and neighboring countries and designed to be implemented as a comprehensive package to improve newborn survival. This paper reviews the process, progress, and lessons learned from the program design, early-implementation and monitoring and provides future directives to improve upon this integrated package that uses a continuum of care approach from the pre-pregnancy to neonatal periods by involving the communities, health workers and the private sector.

Keywords: Community-Based Neonatal Care Package; integrated package; Female Community Health Volunteer; neonatal mortality; Nepal.

INTRODUCTION

Under-5 mortality is declining in many countries in Asia, and Nepal is no exception.[1] However, neonatal mortality is doing so at a much slower rate, and neonatal deaths as a proportion of infant mortality has been increasing over the years.[2] The fact that the neonatal mortality rate (NMR) has stagnated at 33 per 1,000 live births between 2006 and 2011 is of equal concern.[3] Reducing neonatal mortality remains a major challenge for Nepal, although the country is moving in the right direction to achieve Millennium Development Goal 4 based on the progress seen in the under-five mortality rate.[4] Greater attention and efforts are required to address the high rates of neonatal deaths, the major causes of which include infection, birth asphyxia, prematurity and hypothermia.[5] Newborn vulnerability is further exacerbated by the fact that 72% of deliveries occur at home, and only 36% of all births are assisted by skilled birth attendants (SBAs).[3]

The Government of Nepal has initiated different activities, including distribution of de-worming and iron tablets to pregnant women, promotion of antenatal care visits and counseling on nutrition, to try to address this situation. Maternal anemia, as a contributor to low birth weight and neonatal risk, has been addressed through an intensified iron supplementation programme in pregnancy with high levels of coverage (79%).[6,7] Attention has been given to better preparedness for delivery, stressing the need for planning logistics, finances, and assistance with the birth through a nation-wide birth-preparedness programme.[8,9] Exclusive breastfeeding and early initiation has been promoted, and other aspects of early essential neonatal care emphasized.[9,10] However, until recently, these approaches had not been organised in a comprehensive strategy that incorporates all preventive and curative interventions.

This article, fourth in the six article series will demonstrate that the development of a neonatal care package is a step toward the continuum of care model from the pre-pregnancy to neonatal periods by involving the communities, health workers and the private sector.

Correspondence: Dilip Chandra Poudel, Nepal Family Health Program II, Oasis Complex, Patan Dhoka, PO Box 1600, Kathmandu, Nepal. Email: dpoudel@nfhp.org.np, Phone: +977 1 5524313.

LITERATURE REVIEW

A secondary desk review was carried out for this article. Authors looked at published documents, reports, journal articles, as well as relevant websites. Programmatic/ monitoring data from CB-NCP-implementing agencies and the Neonatal Health Information System was also analysed.

Community Based Newborn Care Package (CB-NCP) Program

Given that neonatal deaths account for the majority of infant mortality and as a first step towards addressing neonatal health, the Ministry of Health (MOH) developed the National Neonatal Health Strategy in 2004 to improve the health and survival of newborn babies in Nepal by adopting healthy newborn practices, and strengthening the quality of promotive, preventive and curative neonatal health services at all levels of the health system".[5] The slow decline in neonatal mortality rates has not reflected the more steady decrease in infant and under-five mortality. The decline in the latter two can be attributed to the successful implementation of community-based child health programmes such as the Community-Based Integrated Management of Childhood Illness (CB-IMCI),[11] the Vitamin A Supplementation (VAS) programme,[12] and the Expanded Programme on Immunisation (EPI). The former two programmes' extensive mobilization of Female Community Health Volunteers (FCHVs) to expand essential child health services at the community level indicated that a community-based programme targeting neonates was also feasible and appropriate.[13] In addition, a rapid assessment of newborn health by the Department of Health Services (DOHS) in 2007, underscored that despite the existence of individual activities focusing on specific issues, "no single integrated package [existed] for community-based neonatal health programming".[14]

Based on the need and experience of the country, the Department of Health Services (DOHS) developed the Community-Based Newborn Care Package (CB-NCP) in 2007, through a collaborative effort between the Child Health Division (CHD), the Family Health Division (FHD), the National Health Training Center (NHTC), the National Health Information, Education and Communication Center (NHEICC) and external development partners. Based on the need to understand implementation issues, the package was piloted in 10 districts to test whether FCHVs could adequately execute their responsibilities and assess how well the seven programme components are implemented. It was envisioned as the foundation for addition of new interventions, ultimately addressing the full continuum of care.[15]

Adapting Existing Approaches into an Integrated Package for Neonates

A rapid assessment held in 2007 concluded that the most successful approach to target neonatal mortality in settings such as Nepal, with its limited resources and existing health system, would be through the implementation of existing or previously piloted outreach and community-level interventions into one integrated package.[14] Considering the evidence for impact of the interventions, the percent reduction in all-cause neonatal mortality or morbidity, suitability for Nepal if implemented at scale, cost of implementation and status of or experience with existing interventions in Nepal to date, seven interventions were identified to be delivered as a package, adapting the framework by Johnson-Masotti et al.[16]

CB-NCP's overarching goal is to reduce neonatal mortality through high coverage of effective community-based interventions and strengthen facility-based maternal and newborn services.[15] The package is essentially an amalgamation of successful interventions - from broader, cross-cutting approaches like behaviour change communication to specific interventions like management of sepsis. Together they form the seven components of the package which include:

1. Behaviour change and communications (BCC) for newborn health
2. Promotion of institutional delivery and clean delivery practices
3. Postnatal follow up of neonates
4. Community case management of neonatal infections
5. Management of low birth weight
6. Prevention and management of hypothermia
7. Recognition of asphyxia, initial stimulation and resuscitation of asphyxiated baby

CB-NCP is intended to be a dynamic package with new interventions being added, reflecting evolving global and national evidence and experience. Most but not all components of the CB-NCP were well tested and had a sound evidence base. Less was understood about how possible severe bacterial infection (PSBI) would be managed in hill or mountain districts, or about the management of birth asphyxia by FCHVs. Recognising the complexity of the overall package, a comprehensive assessment was envisioned to understand the quality of service delivery, coverage and utilisation of services delivered by the FCHVs and CHWs.[17]

Like for the CB-IMCI, FCHVs are the key players in the

CB-NCP program. However, considering the continuum-of-care approach adopted by CB-NCP, peripheral health workers and health facility workers, to whom FCHVs refer cases, are equally indispensable. This referral system was proven highly effective in the Morang Innovative Neonatal Intervention (MINI), a pilot project that tested whether FCHVs could effectively identify and treat neonates showing symptoms of possible severe bacterial infection (PSBI) with cotrimoxazole and subsequently refer them to health workers. MINI showed that, of the 80% of PSBI cases assessed by FCHVs and referred to health facilities, 94% received the 5-day cotrimoxazole treatment and 91% received a full course of seven doses of gentamicin injection from peripheral health workers.[18]

CB-NCP Interventions

The interventions of the CB-NCP can be grouped into four major headings based on the functions and impact as below.

Behaviour change communication, institutional delivery, and postnatal care

A major component of the package is the use of the birth preparedness package (BPP). It is an essential tool that is used to raise awareness and consequently change the health seeking behaviour of pregnant women and their families. BPP, known as *Jeevan Suraksha* in Nepali is a major part of the safe motherhood programme, initially piloted in 2002 and gradually expanded nationwide by 2009. The intervention promotes active preparation and decision-making for births, including pregnancy and postpartum periods, by pregnant women and their families.

CB-NCP has adapted the BPP to better fit the needs for newborn care. Adaptations were designed to raise awareness and advocate for institutional delivery, clean delivery practices in the case of home births, use of skilled birth attendants, quality antenatal, postnatal, essential newborn care, understanding of danger signs during pregnancy, and referral conditions during pregnancy, delivery and post-partum periods. In addition, the modified BPP is used to educate families about hypothermia in neonates, and preventive measures for home deliveries. Apart from face-to-face communication between FCHVs and the pregnant women, important BCC messages are transmitted through mass media (e.g. FM radio) and by social mobilisation campaigns in CB-NCP pilot districts.[9]

To emphasise the importance of safe deliveries, FCHVs are encouraged to either accompany pregnant women to a health facility for delivery or attend home deliveries along with a skilled birth attendant (SBA). FCHVs are similarly trained to provide home-based postnatal care (PNC), while SBAs and health facility staff are encouraged to carry out facility-based PNC. The idea is to ensure that both mothers and newborns are taken care of, jointly by SBAs focusing on mothers and FCHVs focusing on newborns.[15]

Community Case Management of Neonatal Infection

MINI, one of Nepal's successful pilot projects, determined that, by using a simple algorithm, FCHVs were able to identify and sustain high treatment coverage of PSBI by administering oral cotrimoxazole and referring the sick neonate to the next level of health workers for the administration of gentamicin injections. CB-NCP adapted the approach used by MINI, and incorporated this approach as one of the seven components of the programme.

Management of low birth weight and prevention of hypothermia

Given that the majority of women deliver at home, few are able to utilise the services offered at health facilities. To reach these women, the CB-NCP incorporated a community-based approach, whereby FCHVs are trained and equipped to identify and manage low birth weight (LBW) in newborns, using colour-coded weighing scales, while providing information and creating awareness about hypothermia and home-based essential newborn care (ENC) practices and ensuring effective referral to health workers and health facilities for very low weight newborns.

An important intervention to prevent and manage hypothermia among newborns is the Kangaroo Mother Care (KMC), widely referred to as *maya ko angalo* in Nepali, which involves early skin-to-skin contact between mother and baby. This approach has been successfully used globally as an alternative to conventional neonatal care, usually unavailable in low-resource settings.[19] FCHVs are given training to educate mothers to manage hypothermia in neonates and give referrals when higher level of care is required. In addition to KMC, FCHVs also advise and support mothers for immediate initiation and exclusive breastfeeding of their newborn.

Recognition and management of birth asphyxia

Management of birth asphyxia is routinely practiced at the health facility level and birthing centers by doctors and nurses. As few births take place at the health facility, it was deemed necessary to extend this function to the community and home setting through the CB-NCP programme and by using FCHVs as the medium. FCHVs are trained to recognize asphyxia, perform step-by-step approach of initial stimulation suctioning and

resuscitation using a bag-and-mask. Simple stimulation has been shown to address the majority of asphyxia cases,[20] and can be taught to CHWs and FCHVs with use of a simple algorithm. However, less is known about the community use of a DeLee suction or bag-and-mask by FCHVs, and the pilot is designed to inform about skill retention, practical feasibility and effectiveness of this element.

Referrals

Recognizing that all newborn problems cannot be assessed and managed at the community and peripheral health facility level, the programme aims to strengthen timely and proper referral mechanisms. FCHVs and CHWs are trained to refer complicated pregnancies, very low birth weight babies, sick newborns without improvements on follow-up visits despite treatment and asphyxiated babies with resuscitation support to a higher health facility level for further investigation and management.

Review and Assessment of Programme

Through the pilot, the MOHP intends to determine the effectiveness and scalability of the programme. Lessons learned and strategic review of the pilot will guide further expansion of the approach. The pilot is currently being assessed based on monitoring data, the comparison of baseline and endline data on key indicators and qualitative assessment focusing on mothers, their families, CHWs, district managers and national level stakeholders. However, preliminary data from selected districts and findings from midterm reviews have demonstrated mixed results.[21,22] Progress has been observed in expanding the coverage and utilisation of key newborn care services and practices, however, there are some concerns on the quality of the services and monitoring data. Some of these issues are generally expected in early stages of any programme implementation and will most likely subside as the programme matures, while others may require focused efforts to improve and adjust the programme.

The CB-NCP programme review for Bardia and final evaluation of the project for Doti reveals that the indicators have improved from the baseline survey (Table 1).

Based on the data, the programme is contributing to increased facility deliveries and having someone attend to the newborn for home deliveries. In addition, several critical practices (e.g. skin-to-skin contact, assessment of newborn's weight, initiation of breastfeeding) have improved likely reducing the risk for neonates and helping to identify and manage newborn infection at an early stage.

Table 1. CB-NCPprogramme indicators(22, 23)

Indicator	Bardia		Doti	
	2008	2011	2008	2011
Delivered at health facility	34%	81%	13%	39%
FCHV present at home delivery	16%	52%	N/A	N/A
Clean delivery kit used during home delivery	34%	70%	61%	79%
Skin-to-skin contact at birth	12%	39%	N/A	N/A
Breastfed within 1 hour of birth	64%	90%	56%	77%
Weighed within 3 days of home births	83%	89%	N/A	N/A

In addition to the results from Bardia and Doti, a Lot Quality Assurance Survey (LQAS) in Sunsari and Parsa by Plan Nepal[23] also showed improvements in care-seeking behaviours and care of newborns between "before" and "after" implementation. These improvements are likely to contribute to a reduction in newborn mortality.

Monitoring data, generated through a special information management system developed for the CB-NCP pilots is helpful but incomplete to draw conclusions from.[17] There are some concerns about data quality, some indicators are under-reported as the new system is not yet fully functional throughout the programme areas and others are over-reported as they are linked with the incentive component of the programme.[17] There is not adequate and strong evidence at this point to determine whether PSBI is being managed adequately, both with regard to identifying cases, and ensuring receipt of the full course of antibiotics.[17] These concerns will be addressed in the on-going comprehensive and joint assessment of CB-NCP being undertaken by an independent group.

Nonetheless, the findings from the surveys and regular monitoring data have encouraged the MOHP to expand the CB-NCP package rapidly, in a phase-wise manner throughout the country by 2015. By mid 2012, CB-NCP is expected to cover 35 districts or approximately 50% of the population. The MOHP has also endorsed the integration of new components that have proven to improve newborn survival into the package, such as use of chlorhexidine for umbilical cord care.[24] Furthermore, strategies are being reviewed and analysed to use the CB-NCP to establish a full continuum of care approach.

WAY FORWARD

The CB-NCP is a complex strategy that is attempting to introduce a full spectrum of activities to reduce maternal and neonatal risk. Capitalising on the network and experience of the FCHVs and CHWs, the CB-NCP

provides them with a new set of skills and responsibilities to improve maternal and neonatal care. The programme is designed not only to improve access and utilisation of services at the community level, but also increase utilisation of health facilities and skilled attendance at births.[15] Thus far, the programme experience in Nepal is encouraging, with improvement in the delivery of services by the health system as well as uptake of healthy behaviours by communities. Further evidence is needed on sustainability, since, implementation of such a complex package may have resulted in gaps in training or absorption of information among FCHVs and health workers. Furthermore, more careful analysis of information is needed for some critical components that contribute highly to neonatal mortality, PSBI and asphyxia.

Nepal is not alone in the need of a focused package on maternal and neonatal health. As part of an international effort to assess government efforts, the Futures Group facilitated the development of the Maternal and Neonatal Program Effort Index (MNPI), a standardized assessment instrument applied in 1999, 2002, and 2005 in a large number of countries. Among 13 component parts for this assessment, South Asia ranked below the overall average for all regions for most components except for family planning at district hospitals, resources, and information/education. Furthermore, South Asia ranked markedly lower in care at antenatal visits (50 vs. 64) and care for newborns (57 vs. 72).[25] In the 2005 MNPI assessments, among 14 components assessed, Nepal scored 53 compared to the mean of 56 for all countries.[26] Nepal's scores were lower for half of the components, and particularly low for antenatal care (54 vs. 63), delivery care (41 vs. 55) and newborn care (58 vs. 68).[26] The introduction of the CB-NCP in 2009 is likely to improve these scores considerably and the learning from the programme will be of equal importance to other neighbouring countries in South Asia.

Indeed, other countries in the region are moving forward with implementation of a set of critical maternal and neonatal interventions. The Indian Government, for instance, has implemented the integrated management of neonatal and childhood illness (IMNCI) programme, which uses outreach workers, auxiliary nurse midwives and *anganwadi* workers specifically, to visit neonates and provide home-based preventive care, health promotion and early detection of illnesses that require referrals.[27] In addition, Bangladesh and Pakistan have both demonstrated excellent results from trials conducted to evaluate the effectiveness of interventions targeting newborns.[20,28] Efforts to incorporate these sets of interventions within the existing public health system are underway.

The strategies for implementation of such interventions should be customized with the health care delivery system and socio-cultural and geographic challenges. Health managers and policy makers should continue to investigate issues, challenges and opportunities for further advancement of the package. Strong community-based monitoring and support systems are required for effective and sustainable implementation of the programme to achieve desired results.

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CONFLICT OF INTEREST

We declare no conflict of interest

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