Nepal Family Health Program
Technical Brief #5

The Morang Innovative Neonatal Intervention

Village Health Worker giving Gentamicin injection.

BACKGROUND

Demographic and Health Surveys (DHS) conducted in Nepal in 2001 and 2006 showed neonatal mortality rates of 39 and 33 per 1000 live births, respectively. Few studies have been conducted to determine the cause of neonatal death in Nepal, but in one Kathmandu hospital-based study, neonatal infections were found to account for about 30% of neonatal deaths.

In Gadchiroli, India, the SEARCH Project had shown that well supervised and supported community health workers can competently identify and manage neonatal infections, resulting in a large reduction in neonatal mortality.

Female community health volunteers (FCHVs) in many districts of Nepal have been trained through the community-based integrated management of childhood illness program (CB-IMCI) to diagnose and treat pneumonia, assessing sick children (2 months to 5 years) for danger signs, (e.g. counting respiratory rate, checking for chest in-drawing, and fever, etc). They have proven themselves capable and willing to treat pneumonia and refer more severely ill children to the nearest health facility. The community has accepted them as providers of this care.

However, very few young infants (under 2 months of age) are brought to them, possibly because the families know that the FCHVs cannot provide treatment. Therefore, it was decided that a pilot program should be initiated to determine whether FCHVs could also assess and correctly initiate management of infections in sick newborns and young infants (under 2 months). The Ministry of Health and Population's (MOHP) National Neonatal Health Strategy (2004) supports the piloting of innovative projects to identify and treat neonatal infections at the community level.

Morang, a large district with a population of 914,799, was selected for the intervention. All 585 FCHVs had been trained to assess and manage childhood pneumonia using oral Cotrimoxazole–pediatric tablets.

Saving Newborn Lives (SNL-1)/Save the Children, United States (SC/US), with funding from the Bill & Melinda Gates Foundation, provided support to JSI Research & Training Institute, Inc. for the original Morang Innovative Neonatal Intervention (MINI) activities (December 2003–October 2006). MINI staff worked closely with NFHP, both in Kathmandu and the field, for mutual program support. In 2006, USAID—through NFHP—provided financial assistance necessary to expand the MINI intervention from the original 21 Village Development Committees (VDCs) to the whole district (65 VDCs) (excluding the sub-metropolitan city) and since October 2006, NFHP has supported the ongoing program costs.

STRATEGIC APPROACH

MINI was designed to determine whether existing community-based FCHVs and the most peripheral paid community health workers (CHWs), sub-health post (SHP)-based maternal child health workers (MCHWs), village health workers (VHWs), and auxiliary health workers (AHWs) of the Ministry of Health and Population (MOHP) could perform a set of activities that would result in improvement in the early identification and management of neonatal infections.

The project tested the hypothesis that implementing a set of activities (training, use of clinical algorithms, early case management, and referral for gentamicin injections) through the existing health infrastructure would result in an increase in the proportion of sick neonates receiving appropriate treatment. All project activities were carried out by MOHP staff, with

support for training, supervision, data collection and analysis provided by MINI staff. The initial pilot project was conducted in 21 "intervention" VDCs in Morang District. Program data from these VDCs were compared with 44 "non-intervention" VDCs. Currently, the MINI program is implemented in all 65 VDCs of Morang district.

The project was not designed to quantify the impact of these interventions on neonatal mortality, but did assist the MOHP in developing a birth and death registry, through which trends in neonatal mortality could be reviewed.

KEY ACTIVITIES

- Obtained methodological and ethical approvals to conduct the pilot project from the Western Institutional Review Board (WIRB) in the USA and the MOHP in Nepal.
- Established two technical working groups (central and district-level) which provided inputs for the finalization of the clinical algorithm, upon which the assessment of the sick young infant is based and ongoing guidance and oversight to MINI activities.
- Developed behavior change communication (BCC), training, recording/ reporting materials, and a monitoring and data analysis system.
- Conducted initial training for MOHP staff (DPHO level-17, health facility (HF) staff-43), community health workers (VHWs-21, MCHWs-15) and FCHVs-189. In late 2006, with NFHP support trained: HF staff-96, VHWs-40, MCHWs-40, FCHVs-400.
- Supported logistic supply for the intervention through District Public Health Office (DPHO) channels.
- Conducted regular monitoring and supervision visits to all CHWs and HFs to solve problems, reinforce clinical skills, and collect data.
- Analyzed data at the MINI office in Biratnagar and provided feedback to DPHO and partners.

FCHV ACTIVITIES

During the original pilot phase, key activities were conducted by FCHVs in the 21 intervention village development committees. In the remaining VDCs FCHVs only conducted birth recording and counseled the family on essential newborn care. Since expansion to the whole district in December 2006, all 585 FCHVs in Morang are delivering the "intervention" services.

In the original 21 intervention VDCs:

- FCHV visits a newborn within 24 hours of birth. She weighs the baby, records the birth, and counsels on essential newborn care and danger signs.
- The FCHV assesses the baby for danger signs. If danger signs are present, she classifies the illness as possible severe bacterial infection (PSBI), assists the caretaker in giving the first dose of oral Cotrimoxazole-P antibiotic, and provides the family with tablets to be given twice daily, for five days. She also makes a third day follow-up visit.
- In addition, the FCHV fills a "call form" to call the VHW/MCHW/AHW to come to the home to give the antibiotic Gentamicin by intramuscular injection daily for 7 days. In this way, the MINI project is also strengthening the referral system through peripheral health workers.
- In addition, if the newborn has birth-weight, below 2.5 kg, the FCHV gives the family extra advice on care of the infant, including frequent breastfeeding and skin-to-skin care. She makes four weekly follow-up visits, over the first month of life. If the baby is very small, less than 2 kg, she refers the family to the nearest HF, but still makes the four follow-up visits herself.
- FCHV/VHW/MCHW/AHWs are also trained and equipped to treat local bacterial infections in the eyes (with tetracycline eye ointment), umbilicus, or mild rashes (with cleansing and gentian violet solution).
- FCHV conducts a two-month follow-up visit to all newborns to determine the outcomes of treatment and the child's survival status.

In the 36 VDCs not included in the initial implementation phase (eight VDCs were excluded initially due to security issues):

- FCHV visited a newborn within 24-hours of birth. She records the birth and counsels on essential newborn care.

Figure 1. Algorithm - Possible Severe Bacterial Infection

Presence of **any one** of the following:

1. Unable to breastfeed
2. Lethargic or unconscious
3. Fast breathing
4. Severe chest indrawing
5. Grunting
6. Fever
7. Hypothermia
8. Umbilical discharge with redness extending up to surrounding skin
9. 10 or more skin pustules or 1 abscess
10. Weak or absent cry

- FCHV did a 2-month follow-up visit to all the newborns to determine the survival status.

RESULTS

For the 21 intervention VDCs, 20 months of data (May 2005 – December 2006) were analyzed:

FCHVs

- Recorded 9,546 births (60% of expected—uncorrected).
- Conducted 2-month follow-up visits for 92% of all births recorded.

Cause of Death

- Verbal autopsies were conducted by senior pediatricians for 125 deaths in the 21 intervention VDCs. Cause of death was assigned: infection-44%, birth asphyxia - 39%, prematurity, respiretory distress syndrome and low birth weight - 12%, birth defects - 2%, other - 3%.

Birth Weight

- Weight was measured for 99% of neonates, 53% within the first 3 days of birth; 10% were found to be of low birth weight (below 2.5 kg).

Infections

- 13% of young infants (under 2 months) developed possible severe bacterial infection.
- 10% of neonates (under 28 days) developed PSBI
- 21% of young infants developed a local bacterial infection (LBI).
- **Danger Signs**: The most commonly observed danger signs were: fever (54%), fast breathing (38%), more than 10 skin pustules or one large abscess (26%), unable to feed (18%). 52% of cases had two or more danger signs.

Management of Possible Severe Bacterial Infection (PSBI)

- First managed by:

FCHV	65%
VHW/MCHW	20%
Health facility	15%

- **Treatment Coverage** (May 2005 – Dec 2006):
  - in intervention VDCs - 80% of expected PSBI cases (vs. 5% at baseline);
  - in non-intervention VDCs - 35% (vs. 6% at baseline).
- **Treatment Completion**
  - 91% of neonates with PSBI received Gentamicin injections.
  - 93% completed 7-day treatment course with Gentamicin (of Gentamicin-treated cases).
  - 85% completed 5-day oral Cotrimoxazole-P treatment course (of PSBI treated cases).
- **Social Inclusion**
  - Less-privileged groups account for 61% of the total population.
  - 62% of those who got services from MINI were from less-privileged groups.
- **Caretaker Essential Newborn Care Practices**
  - Drying baby thoroughly—54% (vs. baseline-25%)
  - Wrapped baby with a dry cloth and kept warm- 83% (vs. baseline-68%)
  - Delayed bathing for 24 hours- 40% (vs. baseline-20%)
  - Applied nothing to cord- 90% (vs. baseline-48%)
  - Breastfed within 1 hour- 60% (vs. baseline-28%)
- **Quality of Care.** There was 100% agreement between FCHVs and VHW/MCHW/AHWs on the classification of PSBI. When assessing danger signs, if the newborn was examined on the same day by both cadres, the overall agreement for both presence and absence of signs was greater than 90% for all signs.

FCHV (left) with a mother and her newborn, who was successfully treated for neonatal infection.

LESSONS LEARNED

- **FCHVs and CHWs are acceptable to care takers and communities.** FCHVs have proven able and willing to manage neonatal infections. VHWs/MCHWs/AHWs are motivated to save the lives of young infants, even though it requires additional effort on their part. They are administering intramuscular Gentamicin to sick newborns with excellent completion rates. Families and caretakers readily accept this community-based treatment.
- By extending management of neonatal sepsis to the community level, **MINI has greatly increased the percentage of expected cases receiving treatment through the MOHP system**. In the non-intervention area 35% of

expected cases received treatment versus 80% in the intervention area.

- **Good quality services.** Periodic assessments have documented correct case management and high treatment completion rates.
- **Reaching the hard-to-reach.** The District (Public) Health Office refers to MINI as a "pro poor" program because less privileged groups in society are benefiting from the community-based free services. They may be more willing to make use of the MOHP system for other illnesses and preventive services in the future.
- **Improved Knowledge and Practice.** Knowledge and practices of health workers and caretakers have improved and the environment for the program is positive. In fact, there was a large demand from the non-intervention area, asking for MINI to cover the whole district with CB-management of neonatal infections.

CHALLENGES

- **Delays in care seeking.** More emphasis needs to be given in the community to raise awareness in families about the danger signs of infection, the risk of rapid progression to death, and the need to seek care urgently.
- **Sustainability.** MINI staff provided initial support for training, material development, some FCHV/VHW/MCHW incentives (umbrella and bag to carry her supplies), training and BCC materials, drugs and syringes, monitoring, and supervisory support. What will happen to the program performance as the external supports are decreased? Under MINI 2 (SNL-2 supported), a streamlined supervisory support model, similar to that utilized in the CB-IMCI districts, will be tested with periodic assessments to determine the impact on program performance when external supports are decreased.
- **Replication in other districts.** The cost of replication in a more streamlined form needs to be determined and other donors sought who are willing to replicate the MINI model. MINI was designed, from the very beginning, in close collaboration with the CB-IMCI working group of the Child Health Division of the MOHP, as CB-IMCI is the logical program fit for expansion of the management of neonatal infections at the community level. The MOHP leadership is committed and joint planning is needed on how to move forward, refining and streamlining the MINI model to fit in with the existing CB-IMCI program.
- **Geographical challenges.** At the final evaluation dissemination meeting for MINI-1, there was considerable discussion about what to do for the hill and mountain districts of Nepal, as the MINI model could not be simply replicated in those districts due to geographical constraints. Several options were discussed at the dissemination meeting, including: testing Gentamicin in UNIJECT for Nepal; utilizing a Cotrim-P only option, where referral is not possible.
- **Policy issues.** Gentamicin needs to be added to the essential drug list for SHPs, to ensure that it is available when and where needed. Revision of the national FCHV strategy to allow for postnatal home visits by FCHVs needs to be discussed, as many neonatal and maternal health initiatives require this immediate postpartum contact. Strengthening the iron intensification program and "pregnancy surveillance" will strengthen other maternal and neonatal health interventions.

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