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COMMUNITY BASED NEWBORN CARE IN ETHIOPIA

Executive Summary for the Quality of CBNC
programme assessment Midline Evaluation Report
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3 IDEAS

EXECUTIVE SUMMARY



This document presents results from a quality of care assessment of the Ethiopian Community Based Newborn Care (CBNC) programme conducted in late 2015. It provides a summary of the seven chapters that are included in the main report in a succinct manner. The document focuses on the delivery of newborn care and illness management services within a community setting, primarily by health extension workers (HEWs). CBNC is a pioneer Ethiopian national programme, which precedes the World Health Organization's policy on antibiotic use by frontline workers for neonatal illness. The CBNC programme quality of care assessment presented in this document focuses on investigating facility readiness, system integration, health workforce potential and HEW competence to provide quality newborn care services.

BACKGROUND

The CBNC programme is a key milestone of the Ethiopian Health Extension Program. Building on lessons learned from integrated Community Case Management of childhood illness (iCCM), the implementation of CBNC used the following guiding principles to ensure rapid, high-quality implementation: 1) government leadership and ownership; 2) spanning the continuum of care; 3) balance between preventive and curative care at the community level; 4) quality service; 5) community participation; 6) strong health system support, and 7) phased implementation approach and partnership.

The goal of the CBNC programme is to reduce newborn mortality through strengthening the primary health care unit (PHCU)¹ approach and the Health Extension Program. This goal is achieved by improving linkages between health centres and health posts and the performance of Health Extension Workers (HEWs) and Women's Development Army (WDA), to improve antenatal, intrapartum, postnatal and newborn care through the "four Cs" (1) early prenatal and postnatal Contact with the mother and newborn; (2) Case-identification of newborns with signs of possible severe bacterial infection; (3) Care, or treatment that is appropriate and

initiated as early as possible; and (4) Completion of a full seven-day course of appropriate antibiotics. CBNC implementation involves the scaling-up of community based maternal and newborn health (MNH) services in:

1. Early identification of pregnancy
2. Provision of focused antenatal care (ANC)
3. Promotion of institutional delivery
4. Safe and clean delivery
5. Provision of immediate newborn care, including application of chlorhexidine on the cord
6. Recognition of asphyxia, initial stimulation and resuscitation of the newborn baby
7. Prevention and management of hypothermia
8. Management of pre-term and low birth weight neonates
9. Management of neonatal sepsis and very severe disease (VSD) at community level

COMMUNITY-BASED NEWBORN CARE IMPLEMENTATION

CBNC was launched in March 2013 by the Government of Ethiopia in collaboration with its implementing partners (UNICEF, Last 10Kilometres, Integrated Family Health Program-IFHP, and Save the Children). CBNC was implemented in two major phases. Phase I was implemented in March 2014 in all the woredas and PHCUs of seven selected zones from the agrarian regions namely: Amhara (East Gojam zone), Tigray (Eastern zone), Oromia (North and East Shewa zones) and Southern Nations Nationalities and Peoples' (SNNP) Region (Wolayita, Gurage and Sidama zones). These zones were selected due to the strength of their health system. In these seven zones a total population of over 11 million was expected to benefit from the CBNC interventions, with 2.6 million women of reproductive age and almost 400,000 expected deliveries per year. The CBNC programme in Ethiopia has the following objectives:

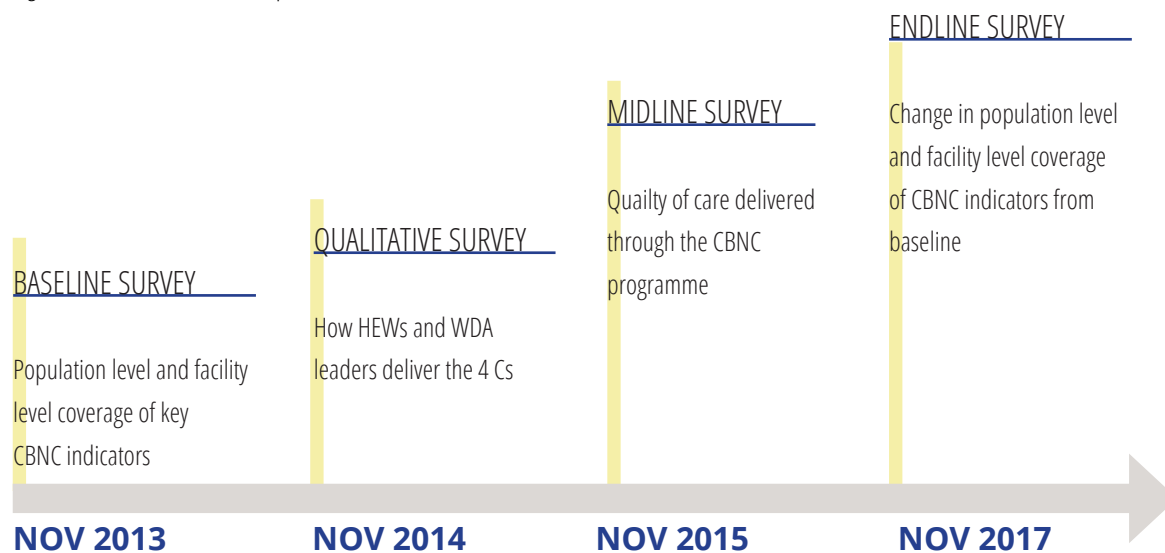
1. To further strengthen the PHCU approach and the Health Extension Program by improving linkages between health centres and health posts and the performance of the HEW, to scale up community based MNH services including introduction of newborn sepsis management;
2. To strengthen the capacity of health centres in providing quality maternal, newborn and child health services;
3. To further strengthen logistics and information systems within the PHCU context;
4. To improve maternal and newborn care practices and care seeking through the WDA and other existing effective community mobilization mechanisms; and
5. To draw experience and lessons from the initial phase to inform the scale-up phase.

The major activities for Phase I included preparation of training guides and supporting training materials for health workers, HEWs and the WDA leaders, cascaded training, regional and zonal level orientation, orientation of the WDA on CBNC, follow-up after training and regular supportive supervision, Performance Review and Clinical Mentoring (PRCM) meetings and procurement and distribution of essential supplies and drugs as well as operations research.

By August 2014 all HEWs in PHCUs in these zones had completed training. Based on learning from the Phase I zones Phase II of CBNC programme implementation was launched in January of 2015, with training in some zones taking place at a later date.

The London School of Hygiene & Tropical Medicine is collaborating with the Ethiopian Federal Ministry of Health to conduct an evaluation of Phase I, through the IDEAS (Informed Decisions for Actions in Maternal and Newborn Health) project. Funded by the Bill & Melinda Gates Foundation, IDEAS works with JaRco Consulting, an Ethiopian based research agency.

Figure i. CBNC evaluation: components of CBNC Phase I evaluation



CBNC EVALUATION

The objective of the CBNC Phase I evaluation is to gather, analyse and synthesise evidence to determine whether and how community-based newborn care in the seven Phase I zones leads to increased coverage of critical interventions along the continuum of care, reflecting the CBNC programmatic components. The evaluation design includes before-and-after coverage surveys of key behaviours and interventions at household level and will compare Phase I (early implementers of CBNC) with Phase II (late implementers of CBNC)² areas. The evaluation also includes a qualitative study to assess how CBNC is being implemented (Figure i).

The CBNC baseline survey was conducted in the fourth quarter of 2013³ and the endline is tentatively scheduled to take place in the fourth quarter of 2017, three-and-a-half years after the start of CBNC implementation. The CBNC evaluation also includes qualitative work to understand implementation processes, as well as a midline quality of care survey. This document details the methodology, results, discussion and recommendations that have resulted from the CBNC quality of care survey (midline evaluation) conducted in the fourth quarter of 2015.

CBNC MIDLINE SURVEY OBJECTIVES

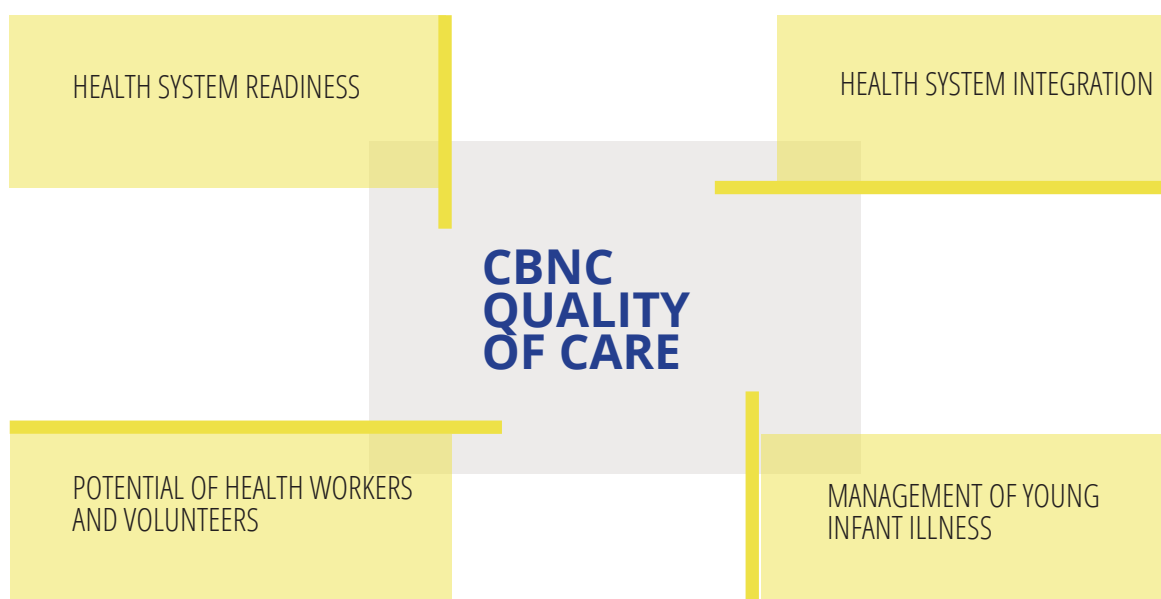
The CBNC midline quality of care evaluation has the following four main objectives:

1. To compare the health system readiness to provide quality CBNC services in CBNC early and late implementing areas.
2. To compare the health system integration within the PHCU for quality CBNC services in CBNC early and late implementing areas.
3. To compare the potential of health workers and volunteers to deliver CBNC services in CBNC early and late implementing areas.
4. To compare the quality of care provided by HEWs including sepsis management for infants less than two months of age, at the health post level in CBNC early and late implementing areas.

CBNC MIDLINE SURVEY METHODS

Like the baseline survey, the CBNC midline survey took place in 12 zones across the four regions of Ethiopia - Amhara, Oromia, SNNP and Tigray. Data were collected over six-and-a-half weeks

Figure ii. The four domains used to conceptualise the quality of CBNC services



from October-December 2015. Overall, the sampling procedure for the survey resulted in a representative sample of PHCUs in the selected zones. The midline survey compared the CBNC quality of care between PHCUs in the seven CBNC early implementing zones and PHCUs in the five CBNC late implementing zones. The selection of zones for comparison was based on the Ministry of Health's recommendation, with the understanding that CBNC implementation in these zones was likely to take place after the endline survey had been conducted. However, Phase II of the CBNC programme started in 2015. As such the midline survey assesses CBNC programme maturity by making comparisons between areas that had a minimum of one year (average 19 months) of CBNC programme implementation and areas where implementation had just started (average of three months) prior to the midline survey.

The sample size calculation for the midline survey aimed to detect a minimum 15 percentage points change in correct classification of young infant health status (0-2 months old)

based on CBNC guidelines between early and late implementing areas (primary outcome), with a minimum of 80% power, and a 5% level of significance. This required a sample size of 420 young infants in early and 300 in late implementing areas. This was achieved by sampling 140 health posts with three young infants per health post in the early implementing areas, and 100 health posts with three young infants per health post in late implementing areas. The 140 health posts in early implementing areas were distributed across 70 PHCUs and 100 health posts in late implementing areas were distributed across 50 PHCUs, proportionate to the population size of the PHUCs.

This study was conducted in 30 woredas (18 in early implementing areas and 12 in late implementing areas), 117 PHCUs (70 in early implementing and 47⁴ in late implementing areas) and 240 health posts (140 in early implementing and 100 in late implementing areas). Health facility surveys were conducted in 117 health centres and 240 health posts to collect information on catchment population, infrastructure, as well as CBNC-related staff profile,

supervision, equipment, medicine, job aids and register review. A total of 240 HEWs and 240 Women's Development Army (WDA) leaders each were also interviewed with respect to their CBNC-related knowledge, training, supervision, mentorship and service delivery. Lastly, the skills of all 240 HEWs to deliver quality CBNC case management were assessed through clinical vignettes, antibiotic injection simulation and young infant clinical case classification. Clinical vignettes covered clinical scenarios for management of young infants with VSD, VSD follow up care and general counselling for healthy newborns. For the clinical case classification, a total of 893 sick young infants of less than two months old had an observed consultation with a HEW, followed by a re-examination by a health officer.

This documents summarises the findings from the midline study where results are presented by early and late implementation areas, as well as total for all the PHCUs visited. The main report has seven chapters. Chapter 1 provides a brief background on the CBNC programme as well as an overview of the CBNC

drug supply chain and the supply of key job aids relevant to CBNC, as well as at referrals of sick newborns from the health posts to health centres.

- C. Potential of health workers and volunteers to deliver quality CBNC services (Chapter 5): Under this domain, the survey assessed the level of CBNC programme training, knowledge and practice among HEWs and WDA leaders. This survey implemented a novel technique of using images from the family health card (a maternal and child health behavioural change communication job aid) as flash cards to assess WDA leaders' knowledge.
- D. Management of young infant illness (Chapter 6): Under this last domain the survey assessed HEWs' competence to deliver CBNC services. For this purpose, novel techniques were also employed. HEWs' case management skills were assessed through clinical vignettes following the CBNC protocol. HEWs' skills in appropriately providing gentamycin injections were assessed through an injection model. Lastly, HEWs' case classification skills were assessed although

“THE QUALITY OF THE CBNC PROGRAMME HAS BEEN CONCEPTUALISED AND ASSESSED ACROSS FOR KEY DOMAINS.”

evaluation, with a focus on the midline survey. The methodology for the midline survey is provided in Chapter 2.

The quality of the CBNC programme has been conceptualised and assessed across four key domains and the results of midline survey are presented under these domains (Figure ii):

- A. Health system readiness to provide quality CBNC services (Chapter 3): Health system readiness was assessed in terms of facility readiness (equipment, drugs and number of trained staff). The level of supervision, mentorship and CBNC-related service delivery was also investigated.
- B. Health system integration within the PHCU for quality CBNC services (Chapter 4): Under this domain, we looked at the

an observed consultation for a sick young infant between the ages of 0-2 months, followed by an independent re-examination of the newborn by a health officer. Although the WHO health facility assessment guide does not include case observation for 0-2 month infants, we adapted the tools used for 2-59 month old children in accordance with the iCCM chart booklet issued by the Ethiopian Ministry of Health.

A discussion of the results and recommendations are detailed in Chapter 7. There is also an Appendix of tables that show coverage of other MNH-related indicators, some of which are not directly tied to the management of newborn illnesses.

SUMMARY OF KEY MIDLINE SURVEY FINDINGS AND DISCUSSION

Health system readiness to provide quality CBNC services

As detailed in Chapter 3, the assessment of health system readiness to provide quality CBNC services indicated that most facilities have the necessary equipment, supplies and job aids to provide CBNC services. However, poor supplies of water, soap and hand sanitizer at health posts and health centres, have major implications for hygiene, particularly when handling a newborn. There was a shortage of HEWs in late implementing areas, although despite this shortage, compared with early implementers, a greater proportion reported being available to provide services on weekends and holidays. On average health posts were open for five working days, with 15% reporting that they were operational for two to four days a week.

The frequency of Performance Review and Clinical Mentoring meetings was promising with 67% of HEWs reporting that they had attended a meeting in the last six months. Fifty-eight percent of HEWs (69% in early and 43% in late implementing areas, $p < 0.001$) reported receiving a CBNC/iCCM programme specific supervision in the last six months. However, the most notable gap in health system readiness was infrequent integrated supportive supervisory visits, with 52% of HEWs (53% in early and 50% in late implementing areas) reporting that they had not received a visit in the last month. Furthermore, visits did not adequately cover aspects of sick newborn care management. Among those receiving a visit in the last six months, 53% of visits were conducted by health centre staff, 18% by woreda health office, 13% by an implementing partner and 15% of visits were joint (between health centre, woreda health office and/or an implementing partner).

On the day of the survey, 97% of health posts had amoxicillin and 91% had gentamycin. A quarter of health posts had expired oral rehydration solution and half had expired zinc. The level of supervision from health centre to health post has

to be strengthened to ensure that HEWs are providing services according to the CBNC protocol and also to ensure that the necessary drugs for the management of newborn illnesses are available.

With respect to the function of health facilities in providing CBNC services, there were good linkages between health posts, WDA leaders and communities, with two-thirds of HEWs organising monthly pregnant women's conferences that were widely attended by expectant mothers. Service utilisation records showed that ANC and facility deliveries are on the rise. However, postnatal care (PNC), particularly at health posts, was very low.

A record review of health post and health centre registers indicated possible misclassification of data because of the way that PNC 1 is defined by different health centres (PNC within the first 24 hours of delivery prior to discharge vs after discharge). Similar problems were also evident with respect to how both the four ANC and four PNC visits are recorded by health workers (timing of visit vs number of visits). This indicates a conceptual problem, highlighting a lack of clarity in the definitions of these indicators and what they are capturing. The problem can be addressed through training and supervision. It is important to ensure that health centres and health posts record PNC and ANC in a standardised manner so that accurate tracking of these indicators can inform decisions to improve service uptake.

Health system integration within the PHCU for quality CBNC services

Chapter 4 assessed the level of system integration that exists at the PHCU level to provide quality CBNC services. The availability of CBNC-related drugs at health centres, for supplying health posts, was also examined to assess the level of system integration. Overall, 80% of health centres had some form of amoxicillin (125 mg/250 mg dispersible tablet and/or 125mg/5ml syrup) with no reported stock-out in the last three months. Only 2% of health centres had amoxicillin stock-outs lasting three months or more. In contrast, 75% of health centres had experienced stock-out of gentamycin 20mg/2ml at some point in the previous

three months, with 43% having stock-out lasting three months or more. The reason for this high level of stock-out could be because health centres are encouraged to pass this drug to health posts rather than retain it at their facility.

Among health centres that had received amoxicillin (125 mg and 250 mg dispersible tablets, as well as 125mg/5ml syrup) and gentamycin (20 mg/2ml) deliveries in the last three months, over half were provided by the woreda health office, with this proportion being lower in early implementing areas, where implementing partners played a greater role in providing these drugs.

The review of the Integrated Management of Newborn and Childhood Illness (IMNCI) register showed that 825 (378 in early and 447 in late implementing areas) infants 0-2 months were seen across 104 health centres in the three months preceding the survey. The remaining 13 health centres (five in early and eight in late implementing areas) had not recorded any cases for the above mentioned period. Similarly, the iCCM 0-2 month registers at health posts had recorded 428 (289 in early and 139 in late implementing areas) cases in the three months preceding the survey. The remaining 46 health posts (13 in early and 33 in late implementing areas) had not recorded any cases of infants 0-2 months for the preceding three months. At health post level, among those classified as having VSD, 46% were referred

to health centres. Among the 54% that received treatment at the health post, 80% were recorded as having completed their gentamycin injection.

Further review of registers to assess referral linkages showed a minimal level of follow-up, with only 7% of young infants recorded as referred in the iCCM registers at health posts being cross-linked to IMNCI registers at the referral health centre.

The assessment of government owned vehicles for the most recent obstetric referral showed that 63% had used woreda health office or health centre owned ambulances.

Potential of health workers and volunteers to deliver quality CBNC services

The assessment of health workforce potential showed that the majority of health centres (95%) had one or more staff members trained in IMNCI and 68% had CBNC trained staff. The high availability of IMNCI trained staff at health centres is promising. Improving the availability of staff trained both in CBNC and IMNCI will further ensure the quality of CBNC supportive supervision and mentorship that can be provided to HEWs.

CBNC training had been scaled up in Ethiopia. In this study, 98% of HEWs (100% in early and 96% in late implementing areas) had received CBNC training. However, a quarter of HEWs had not attended annual Integrated Refresher Training. The assessment of HEWs' unprompted knowledge (without the use of the chart booklet) showed that they had very good knowledge on nutritional counselling and assessment. Though there were gaps in their knowledge across newborn care and signs for sick newborns, HEWs had good knowledge of management and treatment for newborns with a given disease classification. Caution should be taken when interpreting the results in the HEW knowledge section of this document. As per government guidelines, HEWs are not expected to memorise all danger signs. Rather they are instructed to refer to the iCCM chart booklet.

**“THE MOST NOTABLE
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The majority of WDA leaders reported having received an orientation in newborn care in the last 12 months. Yet, like HEWs, assessment of their knowledge showed that there were major gaps in their unprompted knowledge on newborn danger signs. Their comprehension of the family health card (a maternal and child health behavioural change communication job aid), assessed through flash cards of images depicting key messages, showed a lack of understanding among the majority of WDA leaders. As the family health card serves as the key job aid for WDA leaders to conduct their work, it is important to ensure that their orientation covers explanations of the messages it contains.

Management of young infant illness

HEW skills for the management of CBNC related young infant illness were evaluated through clinical vignettes, antibiotic injection simulation and direct observation of care management including clinical case classification.

Clinical vignettes for VSD case management, VSD follow-up care and general counselling for a healthy newborn showed that overall HEWs had good patient identification skills, although there were some minor gaps. This was similar to the findings from the 0-2 iCCM register review, which showed near complete data on newborns' background information. Overall, HEWs in both early and late implementing areas were similar with respect to their clinical skills to provide counselling for a healthy newborn. With respect to management of VSD cases, HEWs from early implementing areas had better clinical reasoning and management skills than those from late implementing areas. The most striking gap was the limited skills of studied HEWs in identifying the signs to correctly diagnose a sick newborn. However, if HEWs were verbally informed about specific signs of a young infant's illness, over three-quarters were able to provide the appropriate diagnosis and treatment for VSD. The gap in HEW's ability to recognise signs and symptoms for a specific young infant's illness highlights an area for focused training and clinical mentorship, which can bridge the observed gap.

Assessment of HEWs' skill in providing an intramuscular injection of gentamycin to newborns showed that their overall skill is low, which was surprising given their experience in providing vaccinations. However, HEWs from early implementing areas demonstrated better injection skills than those in late implementing areas.

This study also conducted case classification for 893 young infants aged 0-2 months that were considered sick by their caregivers. The major challenge faced was the absence of caregivers spontaneously bringing their sick young infants for treatment at the health post. As a result, we mobilised caregivers in the community to bringing their 'sick' babies, to the health post. All young infants 0-2 months old considered sick by their caregivers were included in this study.

Comparison of the health officers' diagnoses to those made by HEWs showed that HEWs were able to correctly identify young infants that did not have a particular illness, as not having an illness. This is a promising finding as it suggests there is little misuse of antibiotics for young infant illness by HEWs. However, HEWs from both early and late implementing areas showed similar gaps with respect to correctly identifying babies that presented with an illness. The clinical vignettes and illness case classifications highlighted the areas of challenge in their theoretical and practical understanding of young infant management. HEWs misclassified 70% of VSD and 72% of feeding problem cases as not having these conditions. HEWs were able to correctly identify 55% of young infants that had local bacterial infection. Overall, two out of five sick young infants were correctly classified by HEWs. This indicates that some sick young infants were not receiving the appropriate life-saving drugs at the health post level.

Data collectors spent time with HEWs the day before the sick young infant assessment to explain the purpose and process of the study, ensuring they were comfortable and able to provide services as per their routine. However, it is likely that HEWs performance may have differed in the absence of the observer.

It is important to note that there are several factors affecting HEWs' ability to correctly diagnose a sick young infant, including opportunities to practice clinical skills, supportive supervision and clinical mentoring. This was not assessed. Such nuanced analysis will be part of future work.

The experience of the caregivers at health posts was very positive. Exit-interviews showed that they were satisfied with the care that was provided to them by the HEWs, which potentially reinforces positive health seeking behaviours and sustains the demand for community newborn care services.

Health system readiness to provide quality CBNC services needs:

- a functional infrastructure at health post level
- CBNC essential drug supply
- supportive supervision of health post staff
- streamlined data management processes at PHCU level, especially standardisation of the indicator definitions across the health system

Health system integration within the PHCU for quality CBNC services needs:

- an intact and responsive supply chain for CBNC antibiotics
- improved record keeping of CBNC services
- an effective referral process between health posts and health centres including transport and necessary documentations

Potential of health workers and volunteers to deliver quality CBNC services needs:

- regular needs assessment
- periodic refresher trainings
- optimisation of the potential of WDA leaders to create demand for CBNC services

Effective management of young infant illness needs:

- periodic examination of HEWs' diagnostic and management skills
- addressing observed gaps with supervision and mentoring

RECOMMENDATIONS

This survey provides an overview of the quality of CBNC services provided in early and late CBNC implementation areas. Overall, the health system readiness to provide quality CBNC services showed that there were good linkages within PHCUs and health facilities were well equipped with job aids, equipment and supplies. However, in some facilities there was an observed lack of water and soap. Furthermore, there were stock-outs of CBNC-related drugs at both health centres and health posts. Most notably, there was a major gap in supervision, which heavily limits a facility's readiness to provide quality CBNC services. With

respect to system integration, the most notable gap was the lack of follow-up on referrals from health posts to health centres.

Assessment of HEWs' unprompted knowledge showed gaps in their ability to cite newborn danger signs. Although HEWs are not expected to memorise danger signs, they need to know the signs that should prompt them to refer to the chart booklet. This was further highlighted by the clinical observations where HEWs were unable to recognise young infants that presented with danger signs. In clinical vignettes, once HEWs were informed

of the exact danger signs, they were able to diagnose young infants and provide appropriate treatment. An assessment of intramuscular injection of gentamycin by HEWs indicated that early implementing area HEWs performed better than late implementing area HEWs, though both groups require further training. Despite these shortcomings, HEWs were providing services to caregivers that left them satisfied by the experience, which could potentially endorse positive health seeking behaviour by the community for neonatal illness and create community demand for CBNC services. WDA leaders also had limited understanding of images included in the family health card, with the gap being wider among late implementing area WDA leaders.

Results from this survey can enable CBNC programme implementers to understand the quality of services and identify strengths and gaps, so as to direct their implementation efforts accordingly. It is strongly recommended that the results presented in chapters 3-6 be thoroughly reviewed to identify overall gaps in quality, as well as gaps specific to early and late implementation areas. Based on the findings from this midline survey, we present key recommendations below for improvement across the four domains used to conceptualise quality CBNC service delivery:

Health system readiness to provide quality CBNC services

1. Incorporate supportive supervision activities specific to CBNC and iCCM into routine supervision visits
2. Make provision of MNCH/CBNC-related integrated supportive supervision for HEWs a key responsibility of health centre staff, by including it as an indicator during their performance review
3. Increase the frequency of supervision from health centres to health posts, ensuring that visits cover an assessment of HEWs' VSD service provision as well as monitoring drugs supply
4. Improve the infrastructure, especially the water supply

5. Develop and implement a well-defined matrix for measurement of ANC and PNC through HMIS
6. Explore the possibility of integrating post-natal care services with CBNC practices, as they are targeting the same timeframe and closely linking them will benefit both services

Health system integration within the PHCU for quality CBNC services

1. Improve the supply chain system for CBNC related drugs, ensuring that the drugs are fully incorporated into the Pharmaceuticals Fund and Supply Agency and the Integrated Pharmaceutical Logistics System
2. To ensure follow-up on referrals from the health post, increase access to woreda ambulances for transport of sick young infants to health centres
3. Ensure the availability of official referral forms at health posts and train HEWs to use them when referring sick newborns
4. Provide each sick young infant with a unique identifier for easy follow-up within the PHCU to ensure provision and completion of treatment

Potential of health workforce to deliver quality CBNC service

1. Explore the possibility of including CBNC as part of pre-service training to be supported by systematic on the job mentoring
2. Ensure periodic and structured coaching by HEWs to enhance WDA leaders' understanding of maternal, newborn and child health (MNCH) promotion messages spanning all CBNC components
3. Strengthen WDA leaders' capacity for demand creation to increase uptake of newborn services, focusing on their ability to recognise danger signs for young child illness and effective use of the family health card.
4. HEWs and WDA leaders' training should incorporate their satisfaction and engagement to inform the content and design of future trainings

Management of young infant illness

1. Create innovative, skills based trainings and mentoring activities for HEWs focusing on the recognition of danger signs in young infants
2. Provide periodic refresher training to HEWs on intramuscular injections for young infants using innovative technologies and methods
3. To overcome limited case load of sick young infants at the health post level, invite HEWs periodically to health centres to observe case management skills practiced by health officers
4. Revitalise the skills labs, especially for HEWs' CBNC refresher trainings

1. The primary health care unit consists of a health centre together with the surrounding satellite health posts.
2. Areas for comparison were selected from zones where CBNC roll-out was planned to be as late as possible, due to the need to further strengthen the iCCM programme, PHCU linkages and the Women's Development Army (community volunteers) prior to implementing CBNC.
3. Berhanu, D. Bilal, B.A. (2014) Community Based Newborn Care: Baseline report summary, Ethiopia October 2014. London: IDEAS London School of Hygiene & Tropical Medicine.
4. Three PHCUs in North Gondar zone (late implementing zone) were not visited due to civil unrest. More health posts in other PHUCs of the same zone were visited to ensure the desired sample size.

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