Community-Based Newborn Health Promotion in Pastoralist Ethiopia:

The Social Mobilization and Demand Creation Project

FINAL ASSESSMENT REPORT

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Cover Photo : David Shanklin

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Acknowledgments

Abbreviations

ANC	antenatal care
CCRDA	Consortium of Christian Relief and Development Associations
CGPP	CORE Group Polio Project
CV	community volunteer
ENAP	Every Newborn Action Plan
EPI	essential practices in immunization
FGD	focus group discussion
FHC	family health card
FMOH	Federal Ministry of Health
HCS	Haraghe Catholic Secretariat
HDA	health development army
HEW	health extension worker
MCSP	Maternal and Child Survival Program
MDG	Millennium Development Goal
MNH	maternal and neonatal health
NGO	nongovernmental organization
PHCU	primary health care unit
RHB	regional health bureau
SMDC	social mobilization and demand creation
TBA	traditional birth attendant
UN	United Nations
USAID	US Agency for International Development

Executive Summary

The Ethiopian government's commitment and resources have contributed to considerable progress in improving child health during the past 15 years. To further reduce newborn deaths (those in the first 28 days of life), Ethiopia has implemented a policy framework to support newborn health, reflecting the Every Newborn Action Plan approved by the World Health Assembly in May 2014. In this context, the CORE Group, through the Maternal and Child Survival Program (MCSP), recently designed and implemented the Social Mobilization and Demand Creation (SMDC) Project to test a set of community-based activities to further the goal of lowering neonatal mortality.[1]

The Ethiopia CORE Group Polio Project (CGPP) developed the SMDC Project by (1) reviewing existing government documents on demand generation and social mobilization, (2) conducting a planning workshop, and (3) writing an implementation plan for the project by synthesizing the information from the review and planning workshop. Implementing partners—Hararghe Catholic Secretariat and Erer Woreda, located in Siti Zone, Ethiopia Somali Regional State—were selected for the pilot project based on the accessibility of the site, technical capacity, and flexibility of administrative systems to ensure adequate support and oversight of project activities.

To achieve outcomes in a short period of time (4 months), the project considered two overarching strategies: harmonization of newborn care messages and use of community-based structures, including CGPP structures, traditional community structures, and formal government structures, to share and promote the selected newborn care messages.

The project developed a project logic model that identified inputs, processes, outputs, outcomes, and impact. HEWs and CVs were the two main cadres selected to deliver the newborn care messages to pregnant women and mothers. Project staff received training on a package of guides and materials related to the messages in November 2015, and in November and December they provided 3-day cascade training to 23 health extension workers (HEWs) and 64 community volunteers (CVs). In addition, about 170 community stakeholders received an orientation to the project and key messages.

The project used a mixed method, quantitative and qualitative assessment to measure predetermined project outputs and outcomes before and after implementation. During the quantitative phase of the assessment, the team reviewed records from the three health centers and nine of the 14 health posts in the study and collected data on seven maternal and newborn health indicators. Results of the quantitative assessment indicated that health facility delivery rates doubled (from 7.1% to 14.2%) and registration of pregnant women quadrupled (from 7.4% to 30.0%) compared to pre-intervention rates, although both remained lower than desired. Nearly three in five women (59.3%) who were registered chose to receive antenatal care (ANC) services at a health facility. Further, the same proportion (60.0%) received newborn counseling by CVs who visited their communities. Impressively, more than half of all women (53.9%) who delivered in a health center during the intervention period had previously been registered by the project (and encouraged to use these services). Overall, one in four registered pregnant women delivered in a facility center, much higher than the average for the area, and probably a low estimate given the short intervention measurement period. Home-based newborn visits within 2 days of birth were quite limited, suggesting the many challenges of identifying and reaching newborns in a timely way among a low-literacy, remote, and mobile population.

During the qualitative phase, the project conducted focus groups discussions (FGDs) as well as in-depth interviews with HEWs, CVs, groups of mothers, and a group of community stakeholders. CVs said they considered their communication with HEWs, mostly through mobile phones and meetings, to be adequate. HEWs stated that this communication should occur more frequently, with the support of a more formal system of mobile phone communication. The main barrier to institutional delivery, according to CVs and

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[1]MCSP/CORE Group conducted the study in cooperation with the Consortium of Christian Relief and Development Associations (CCRDA) and Ethiopia's FMOH.

HEWs, was limited transportation, in both directions. Especially mentioned was the lack of transportation from health center to home after delivery.

Mothers who had recently delivered at home identified lack of transport and/or related costs, culturally based delivery traditions, perceived lack of quality of care at health facilities, and mother-grandmother influences as enablers of choosing home delivery. These women viewed the main benefits of CVs' activities as demand creation for ANC and child immunization, exclusive breastfeeding, and newborn danger sign recognition.

Health providers viewed the identification and referral of pregnant women in the community as CVs' most important contribution. Interestingly, they also mentioned that female patients' change in attitude toward male providers was an important contribution.

Discussion/Conclusions

This study shows that community-based pregnancy surveillance can be achieved rapidly and effectively when it is integrated into established community-based delivery platforms. Within a 4-month period, about three out of five pregnant women who were registered had received ANC and newborn health messages. On the other hand, identification and registration of pregnant women does not always translate into service demand. In this project, there seems to be a gap of about 40% between those initially identified and registered and those who later received ANC and counseling on newborns.

This project also demonstrated an immediate impact on the number of women who sought facility-based delivery services, with demand doubling during the pilot. Problems with estimating pastoralist population size make it difficult to measure the actual number and proportion of women who are pregnant and in need of maternal and neonatal services.

Research is needed to find ways to improve methods to track the changing population size and locations of pastoralist groups; to more consistently provide timely local transportation for women who wish to deliver in a facility; and to improve communications between health facilities and community-based CVs in order to increase postpartum care coverage in the home.

Introduction

This report describes a study conducted by the CORE Group through the Maternal and Child Survival Program (MCSP), a global USAID Cooperative Agreement to introduce and support high-impact health interventions in 25 high-priority countries with the ultimate goal of ending preventable child and maternal deaths. The program focuses on ensuring that all women, newborns, and children have access to high-quality health care services.

MCSP/the CORE Group conducted this study in cooperation with the Consortium of Christian Relief and Development Associations (CCRDA) and Ethiopia's Federal Ministry of Health (FMOH). The study supports MCSP's Fiscal Year 2015–2016 work plans.

Project Rationale

In 1990 an estimated 204 of every 1,000 children in Ethiopia died before the age of 5. In response to this appalling statistic, and in keeping with the United Nations Millennial Development Goal (MDG) Four, Ethiopia set out to reduce the child mortality rate by two-thirds between 1990 and 2015. The latest data confirm that by 2012 the rate had dropped to 68 deaths per 1,000, a massive 67% decline in the under-5 mortality rate, achieved 3 years ahead of the self-imposed deadline.

The Ethiopian government's commitment and resources have contributed to considerable progress in improving child health. Bold and ambitious targets were set and backed with real domestic and international resources—in particular, through a new National Health Extension Program. This program added more than 38,000 health extension workers (HEWs) to the government payroll and deployed them to more than 15,000 health posts across Ethiopia. It has played an important role in reducing Ethiopia's under-5 mortality rate, and it could help the country sustain these gains in the long term.

However, further progress on reducing newborn deaths (those in the first 28 days of life) requires an increased commitment and additional resources. To this end, Ethiopia implemented a policy framework to support newborn health, reflecting the Every Newborn Action Plan (ENAP) approved by the World Health Assembly in May 2014 (WHO 2014). Among other initiatives, a number of global development alliances have focused on improving the capacity of facility-based health workers to provide consistent, high-quality maternal and newborn care services.

In this context, the CORE Group Polio Project (CGPP), through MCSP, recently tested a set of community-based activities to meet the goal of lowering neonatal mortality. MCSP designed the Social Mobilization and Demand Creation (SMDC) Project to expand high-quality newborn messages and actions at the *woreda*, *kebele*, and family levels in pastoralist areas of Ethiopia. The project supports the Government of Ethiopia's Community-Based Newborn Care program and the FMOH Technical Working Group on Child Health. CGPP promoted implementation of maternal and newborn health (MNH) communication strategies and messages harmonized with government programs and implemented in tandem with existing public services. International and local nongovernmental organizations (NGOs) leveraged their program/community platforms to promote the adoption of healthy practices for women and newborns, tapping into the "parent power" advocated in the ENAP.

The potential targeted populations included communities in the pastoralist areas of Ethiopia (Benishangul Gumuz, Dire Dawa, Gambella, Harari, SNNP, Somali, and parts of Oromia), where health extension programs and health development army (HDA) programs are almost nonexistent. The program strategy, developed during a 3-day planning workshop (described below), was a generic one that can be adapted according to the development platforms used by partner agencies in the region. The strategy included three main approaches: (1) facilitate collaboration and consensus across the Ethiopian FMOH and NGOs currently

implementing immunization activities related to the CGPP in pastoralist areas; (2) develop a consensus-based package of newborn-related messages to be delivered by a local community-based organization using the CGPP platform, in coordination with local stakeholders; and (3) measure feasibility and effectiveness of the newborn package through a short-term intervention.

Project Description

Planning Process and Design

Planning process

CGPP developed the SMDC pilot project to align with ENAP's strategic objective to promote harnessing the power of parents, families, and communities. The planning process included: (1) reviewing existing government documents on demand generation and social mobilization; (2) conducting a planning workshop; and (3) writing an implementation plan by synthesizing the information from the review and the planning workshop.

The Government of Ethiopia's key newborn health promotion strategy is to include newborn care messages in the family health card (FHC). The card includes about 64 messages on health issues, which HEWs[1] and HDA volunteers[2] share with mothers and caregivers during counseling, either individually or in groups. This strategy has been relatively effective in the agrarian regions of the country. However, there are no well-documented strategies or "best experiences" on promotion of newborn health in the more remote pastoralist and semi-pastoralist areas.

The planning workshop brought together officials and experts representing the FMOH, regional health bureaus (RHBs), the USAID Ethiopia Mission Health Office, CCRDA, CORE CGPP, CGPP member organizations, key organizations working on newborn in Ethiopia and in pastoralist and semi-pastoralist areas, MCSP Ethiopia, health professional associations and societies, the School of Public Health of Addis Ababa University, and others. In addition to sensitizing key partners to the proposed project and getting government buy-in to pilot the project, the workshop mapped the experiences of CGPP members and other MNH partners, reviewed the newborn care messages and associated pictures on the FHC, and proposed strategies to promote newborn health among vulnerable populations in pastoralist and semi-pastoralist areas.

Following the planning workshop, a detailed implementation plan for the pilot project was prepared. A consultant (Abiy Seifu Estifanos) worked with MCSP/CORE Group (David Shanklin and Alfonso Rosales) and the CGPP Ethiopia team (Filimona Bisrat) to write the plan. The implementing partners—Hararghe Catholic Secretariat (HCS) and Erer Woreda, located in Siti Zone, Ethiopia Somali Regional State—were selected for the pilot project based on agreed-upon criteria. These criteria included accessibility of the site, technical capacity of the implementing partners, and flexibility of the administrative system to ensure adequate support and oversight of project activities. The FMOH and Ethiopia Somali RHB also contributed to the development and review of the pilot project.

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[1] In most cases HEWs are women who completed grade 10 level education and received 1 year of training before deployment. Two HEWs are placed at a health post with an average catchment population of 5,000 to provide basic health promotion, and preventive and curative services. There are about 38,000 government-salaried HEWs providing services at more than 16,000 health posts throughout the country. The package of services provided by HEWs includes environmental health promotion, family planning, immunization, and maternal and child health services.
[2] HDAs are female voluntary community workers who support HEWs through mobilizing the community and providing selected health messages. The HDA is organized in such a way that a woman who adopts recommended health behaviors (by implementing the 16-plus health packages of the Health Extension Program)—the network lead—is networked with five other women in the neighborhood to disseminate the healthy behaviors and practices. About five of these networks are grouped into a health development team that has a leader—Health Development Team Leader (HDTLs). The HDTLs meet with HEWs every 2 weeks to review the progress of their work and plan activities and logistics that they use to promote healthy behaviors among mothers in their teams.

Design

The development of strategies for the SMDC project was guided by intended outcomes of Ethiopia's Community-Based Newborn Care program, including improved early identification of pregnant women and increased coverage of antenatal care (ANC), facility-based assisted delivery, and timely postpartum care. Other intended outcomes were improved preparation for clean and safe delivery, improved immediate and exclusive breastfeeding, improved skills among women and families for recognizing neonatal danger signs, improved care seeking for sick newborns, and completion of treatment. To realize these outcomes, the project decided on two overarching strategies.

The first strategy was *harmonization of newborn care messages.* In the SMDC planning workshop, experts representing CORE Group members, other MNH implementing partners, the FMOH, RHB staff, and donors thoroughly reviewed the messages on the FHC. They confirmed that the messages represented current recommendations for messages for women who are pregnant and have recently delivered, and that the language and pictures used to depict the messages were appropriate for most families and communities. The project kept most of the newborn care messages in the FHC as they were and added a few modifications to improve the language and pictures to better reflect the cultural and geographic contexts of pastoralist and semi-pastoralist areas.

The second strategy was *use of CGPP/community structures to share and promote the selected newborn care messages.* In its polio program, CGPP uses community volunteers (CVs) to identify and register pregnant women and newborns.[3] CGPP built on this structure to deliver messages about newborn care for pregnant women and mothers. Furthermore, in response to recommendations made during the planning workshop, the project considered coordinating with additional community resources for promoting the newborn care messages. The three main community-based structures and influential community groups that project staff and volunteers interacted with to implement the SMDC strategy are listed below.

1. *CGPP structures and groups:* These groups included CVs, traditional birth attendants (TBAs), and pregnant women's forums.

2. *Traditional community structures:* These community structures included religious leaders, clan leaders, community-based organizations (*idirs*, *hafoshas*, etc.), traditional healers, and elders and males/husbands. Other influential community members, such as agricultural development agents, veterinary/animal health personnel, and schoolteachers were also included in orientation meetings and follow-up coordination.

3. *Formal government structures:* The formal government community-based structures that the project worked with included regional and *woreda*-level health officials and primary health care unit (PHCU) staff, including midwives and HEWs.

For the pilot *woreda,* HEWs and CVs were the two main cadres selected to deliver the newborn care messages to pregnant women and mothers. Skills-based training on the selected newborn care messages and delivery method was planned for 28 HEWs (an average of two HEWs per *kebele*) and 70 CVs (five per *kebele*) in the 14 *kebeles* of the pilot *woreda.*

To regularly monitor the performance of the SMDC pilot project and improve the quality of implementation, the project used four different monitoring activities:

1. *Joint integrated supportive supervision:* CGPP members conducted integrated supportive supervision jointly with the *woreda* health offices and health partners working in the *woreda.* Standard checklists and job aids were developed and used to guide supportive supervision. The members reported conducting 43 visits during the pilot period.

2. *Regular integrated review meetings:* The project conducted integrated review meetings to review the progress and challenges faced in SMDC for newborn care. The meetings were used to share lessons and best
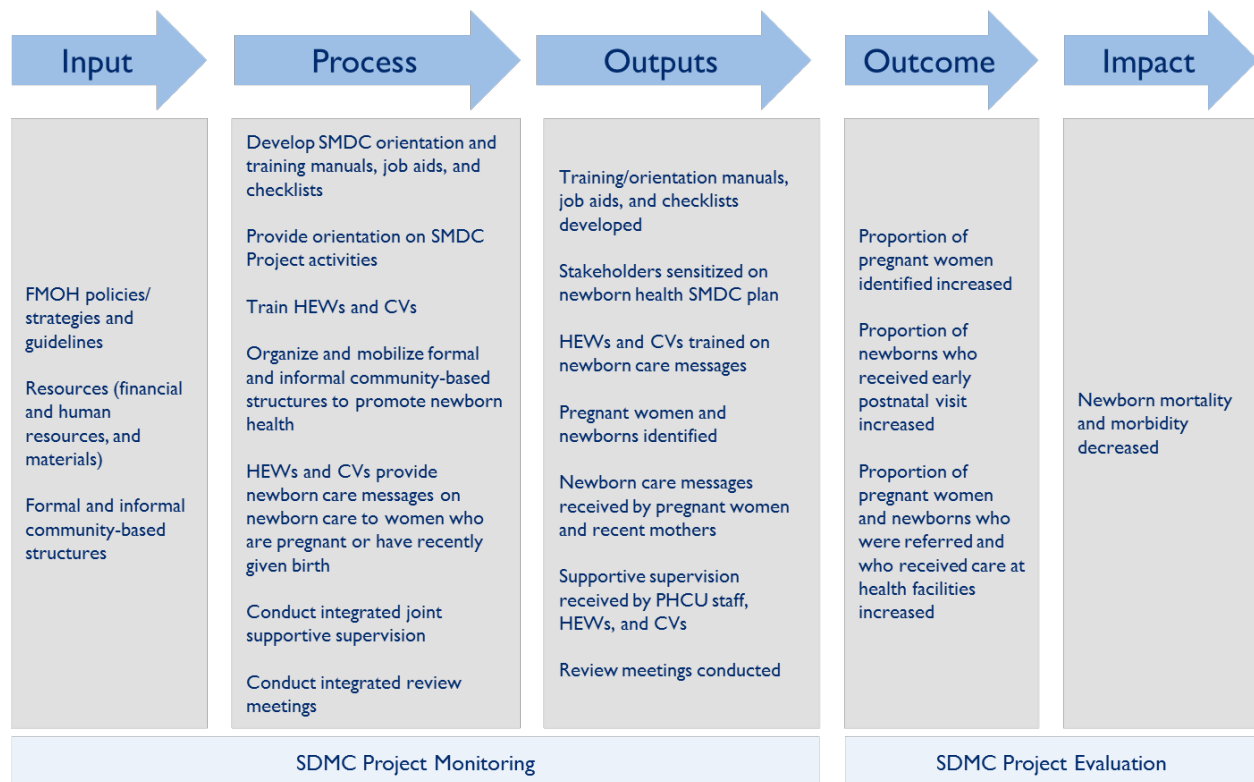
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[3] There was not a strong HDA structure in the pilot site. The project used CVs in place of HDAs to disseminate the newborn care messages.

experiences from best-performing *kebeles* and to recognize best-performing cadres and local leaders to motivate them. The project conducted quarterly review meetings at the *woreda* level, with a defined agenda and participants, and monthly review meetings at the PHCU level.

3. *Routine program reports*: The project routinely collected program implementation data on SMDC activities, including the number of orientations/trainings and supportive supervision/review meetings conducted and the number of checklists/job aids/training manuals distributed. The routine monitoring data were used to track the project's progress in implementing its activities. During regular review meetings, corrective measures were proposed to ensure that project implementation was kept on track.

1. When possible, the project took baseline measures of key indicators, including the number and proportion of newborns and pregnant women identified, the number provided with counseling on newborn care messages, and the number linked with health service facilities. The project logic model (Figure 1) summarizes these baseline measures, and the Results section defines and discusses the indicators.

4. *Assessment:* The project conducted a participatory evaluation of pilot implementation. Project data were reviewed, stakeholder interviews conducted, and data analyzed to draw conclusions and recommendations. The methods and results of the evaluation are detailed in the next section.

Figure 1: SMDC Project Logic Model

Input	Process	Outputs	Outcome	Impact
FMOH policies/ strategies and guidelines	Develop SMDC orientation and training manuals, job aids, and checklists	Training/orientation manuals, job aids, and checklists developed	Proportion of pregnant women identified increased	Newborn mortality and morbidity decreased
Resources (financial and human resources, and materials)	Provide orientation on SMDC Project activities	Stakeholders sensitized on newborn health SMDC plan	Proportion of newborns who received early postnatal visit increased	
Formal and informal community-based structures	Train HEWs and CVs	HEWs and CVs trained on newborn care messages	Proportion of pregnant women and newborns who were referred and who received care at health facilities increased	
	Organize and mobilize formal and informal community-based structures to promote newborn health	Pregnant women and newborns identified		
	HEWs and CVs provide newborn care messages on newborn care to women who are pregnant or have recently given birth	Newborn care messages received by pregnant women and recent mothers		
	Conduct integrated joint supportive supervision	Supportive supervision received by PHCU staff, HEWs, and CVs		
	Conduct integrated review meetings	Review meetings conducted		
SDMC Project Monitoring			SDMC Project Evaluation	

Note: CV=community volunteer; FMOH=Federal Ministry of Health; HEW=health extension worker; PHCU=primary health care unity; SMDC=social mobilization and demand creation

Implementation

Dr. Abiy Seifu, who led the development of the training guides and tools as well as the project's detailed implementation plan, also conducted the initial training of trainers in November. The training centered on two guides, one for training facilitators and one for participants. Participants included staff from CGPP Addis Ababa who were responsible for project backstopping, local HCS project staff, staff from the Erer Woreda health office, and seven midwives from three health centers. These trained staff then provided 3-day cascade training in November and December to 23 HEWs and 64 CVs (Figure 2). Of the 64 CVs, 53 were new; and

of these new CVs, 48 (90%) were TBAs and only seven were literate. Five CVs reportedly left the project during the implementation period, resulting in 59 CVs by project's end. An additional four HEWs received on-the-job training by the HCS Project Manager to ensure that there were two trained HEWs per *kebele* health post.

About 170 community stakeholders, including *kebele* and religious leaders, received an orientation to the project and key messages (Figure 2). The orientation consisted of a series of local half-day meetings that began during the staff and volunteer training period and continued into the first portion of implementation. The purpose of these orientations was to explain project activities, gain the moral and vocal support of these leaders, and answer any questions or concerns raised. In turn, these stakeholders visibly supported the volunteers during the project, and in some cases, they actually participated in village meetings and home visits. Unfortunately, the project did not document this participation during the assessment.

Figure 2: Training Outputs Targeted and Achieved

Indicator	Target	Actual Result	Percentage of Target Achieved
HEWs trained	28	23	82.1%
CVs trained	70	64	91.4%
Stakeholders oriented	187	170	90.9%

As described in the previous section, a series of supervisory activities supported project implementation. The project developed four supervisory checklists to assist in this process, one each for pregnant women, CVs, HEWs/health posts, and midwives/health centers. Again, the project did not document supervision sufficiently to report results during the assessment. A comment that project staff made consistently during this period was that HEWs moved frequently from health post to health post, making consistent follow-up with CVs difficult at times.

Assessment

CGPP implemented the SMDC pilot in one *woreda* to test its feasibility, confirm the acceptability of key messages, and improve pregnancy registration. The pilot phase was conducted during a 6-month period (October 2015–March 2016) in Erer Woreda, in the Siti Zone of the Ethiopia Somali Regional State. In 2015–2016, Erer Woreda had a population of 97,410 living in 14 *kebeles*. The annual expected numbers of pregnant women and births for the *woreda* were 3,078 and 3,020, respectively (based on disaggregated *woreda*-level census data).

The project used a mixed method, quantitative and qualitative assessment to measure predetermined project outputs and outcomes. Output indicators included the number of HEWs trained, the number of CVs trained, the number of stakeholders oriented to the project, and others (see Figure 1 and Results section).

Outcome indicators reported here include the numbers and percentages of women who: were added to the newborn registry system; were referred and received ANC visits; received community-based newborn care messages; delivered at health centers attended by a trained midwife; and received home-based postnatal visits within 2 days of birth.

Quantitative phase

Assessment consultant Fasil Tessema extracted data from records of CVs, health posts, and health centers, with the assistance of participating health posts/HEWs and health centers/midwives. The quantitative data from health facility registries were summarized based on the indicators developed for project evaluation for each health center as well as at the *woreda* level.

Because project implementation began in December, basic comparisons of project performance were possible by categorizing October and November as the pre-implementation period and December through mid-March as the implementation period. The implementation period started when training of CVs and other health staff was completed. Thus, the project team extracted six months (October–March) of data from ANC, delivery, and immunization registries from the three health centers. Because data collection for the assessment occurred in late March, most measures ended in mid-March. *Woreda*-level population, pregnancy, and birth estimates were obtained from the 2015–2016 projected population for the *woreda*, and the 3.16% expected pregnant women and 3.1% expected birth rate were used to calculate target estimates. Figure 3 summarizes the 2015–2016 project estimates in the health center catchment areas.

Figure 3: Project Area Population Estimates, Including Expected Pregnancies and Births

Health service areas	Total population	Annual estimates		Monthly estimates	
Health center		Pregnancies	Births	Pregnancies	Births
Ayidora	30,629	968	949	81	79
Erer	42,805	1,353	1,327	113	111
Hurso	23,976	758	743	63	62
Total	97,410	3,078	3,020	257	252

Qualitative phase

During the qualitative phase of the assessment, the project conducted focus group discussions (FGDs) and in-depth interviews. These activities were conducted in Somali and then translated and transcribed into English. The main objective of this phase was to assess the appropriateness of training content, acceptability and usefulness of training and data-collection tools, and supervisory processes.

Three groups of two persons (facilitator and note taker), supported by assessment coordinators, were assigned to conduct FGDs in each health center catchment. Six individuals identified from within the Dire Dawa and Somali regions, who had at least a bachelor's degree and who spoke fluent Somali, English, and Amharic, were assigned as FGD note takers and facilitators. All FGDs were recorded on audio recording. On a daily basis the notes taken and tape records were translated into/documented in English. The facilitators and the assessment consultant, supported by the evaluation team, carried out the analysis.

The consultant and evaluation team gave an orientation and briefing for FGD facilitators on the procedures and methods to follow during the FGDs. The consultant prepared a short summary of the general guidelines for FGD facilitation, and the orientation team gave it to the facilitators during the orientation, along with the topics and questions for each group's discussion. Each FGD took place at one of the three health centers or a nearby public school and lasted no more than one hour.

There were nine FGDs: two groups of HEWs, three groups of CVs, three groups of mothers, and one group of community stakeholders. Two groups of HEWs (one group of nine and another of eight HEWs) were held in the Erer and Hurso Health Center catchment areas. Three groups of CVs (two groups of 10 and one group of nine) were held in the three health center catchment areas of Erer, Hurso, and Ayidora. One group of eight mothers who had delivered at the Erer Health Center and two groups of mothers who delivered at home (eight from Ayidora and nine from the Hurso Health Center catchment areas) were interviewed. Finally, one group of stakeholders (two women and 10 men) representing the Ayidora Health Center catchment area was gathered for a FGD.

Figure 4 summarizes the composition of the focus groups by health center:

Figure 4: Composition of Focus Groups

Category	Sex/Age	Erer Health Center	Hurso Health Center	Ayidora Health Center	Total
Health extension workers	Female (male)	3 (6)	2 (6)	No HEW group	17
	Age range	22–42	25–45		
Community stakeholders	Female (male)	No community stakeholders group		2 (10)	12
	Age range			26 - 60	
Community volunteers	All are females	10	9	10	29
	Age range	38–56	40–62	34–53	
Recent mothers	All are females	8	9	8	25
	Age range	20–35	19–37	17–40	

Opinions regarding the feasibility of using the civil society organization development platform for newborn messages and actions were collected from three midwives, one from each health center. Interviewers conducted the in-depth interviews mainly in English but also in Amharic if necessary. One person conducted in-depth interviews with midwives or health officers who attended births and were involved in ANC activities at the health centers. Each in-depth interview, conducted face-to-face at the office of the selected respondent, took up to an hour. Interviewers recorded the interviews so that evaluators could extract responses. Before starting each interview, interviewers explained the purpose of the interview and the confidentiality of responses to the participant and obtained their informed consent. The qualitative data from the FGDs and in-depth interviews were transcribed directly and analysis was done based on the topic.

Results

Quantitative Assessment

During data collection, the team reviewed records from the three health centers and nine of the 14 health posts. The data collected included seven MNH-related indicators (Figure 5).

Figure 5: Indicator Targets and Results

Indicator	Definition	Target	Pre-intervention	Intervention period result
Estimated percentage of pregnant women who delivered in a health facility	Number of women delivering at health facility / number expected to deliver in service area	N/A	7.1% (36/504)	14.2% (128/900)
Percentage of pregnant women registered by CGPP project	Number of pregnant women registered / number expected to be pregnant	50%	7.4% (38/514)	30.0% (270/900)
Percentage of pregnant women who were registered who also received antenatal care	Number of pregnant women who received facility-based antenatal care / number registered	40%		59.3% (160/270)

Indicator	Definition	Target	Pre-intervention	Intervention period result
Percentage of pregnant women who were registered and who received newborn counseling from a community volunteer	Number of pregnant women who received community-based newborn counseling / number registered	50%	0.0% (0/38)	60.0% (162/270)
Percentage of pregnant women who delivered at the health facility and also were registered	Number of women who delivered who were registered and delivered at health facility / number who delivered at health facility	30%		53.9% (69/128)
Percentage of pregnant women who were registered and who delivered at a health facility	Number of pregnant women who were registered and delivered at health facility / number registered	30%		25.6% (69/270)
Percentage of registered newborns who were visited within the first 2 days of life in their homes	Number registered newborns visited in their homes within 2 days / number registered newborns	30%		N=15

In all, 270 pregnant women were registered during the implementation period (3.5 months), compared to 38 during the previous 2 months. The results for the first two indicators indicate the measurement challenges in maternal and newborn health care in this population. The population estimate for this largely pastoralist area is subject to large fluctuations due to dynamic fertility rates and outmigration (which in turn is due to economic privation and an extended severe drought, not just seasonal migration of herds and families). As a result, census-based population estimates (used as the denominator) are subject to question. Estimates based on contemporary census status would be better but are technically difficult to achieve. As a result, we know only that the low rates of delivery in health facilities and of registration of pregnant women are due to a combination of actual limited access and use of services on the one hand and the population estimate problem just mentioned on the other hand. Impressively, delivery rates at health facilities doubled, and registration of all pregnant women quadrupled compared to pre-intervention rates, although both rates are lower than desired.

Almost three in five registered women (59.3%) chose to receive ANC services at a health facility. Further, the same proportion (60.0%) received newborn counseling from CVs who visited their communities. More than half of all women (53.9%) who delivered in a health center during the intervention period had previously been registered by the project (and encouraged to use these services). Overall, one in four registered pregnant women delivered in a facility, much higher than the average for the area and probably a low estimate given the short intervention measurement period. Home-based newborn visits within 2 days of birth were quite limited, suggesting the challenges of identifying and reaching newborns in a timely way among a low-literacy, remote, and mobile population. Indeed, it was not possible for the project to count the total number of births among registered women outside of health facilities—thus, the lack of a denominator to use to calculate a result against the target indicator (see Discussion section).

Qualitative Assessment

Overall, participants in the FGDs considered the content of the training materials on pregnancy, problems related to home delivery, and demand creation for institutional delivery to be appropriate. Participants considered the training modules on pregnancy-related danger signs, assessment of a newborn, exclusive

breastfeeding, and postpartum care to be most useful. They found the pictorial information included in the manual to be helpful. Nonetheless, since most health volunteers were illiterate, they still needed support from literate individuals (most often their own school-aged children) to understand and report on some topics. Pictorials most often mentioned by CVs were body edema, headache, and a woman fallen on the ground as a sign of hypertension. Among the messages that FGD participants found most interesting were how to identify the position of the fetus and how to recognize pregnancy- and delivery-related danger signs. During home visits, CVs registered pregnant women, provided messages, and advised mothers to go to the health center for delivery. One suggestion for improvements to the messages and training materials was to add information on genital mutilation. According to HEWs, one of the main benefits of collecting recording forms was that the forms identified pregnant women in the community, which enabled the CVs to encourage the women to start ANC and to consider a facility-based delivery.

On average, CVs reported that they spent 2–4 days per week and about 3 hours per day (usually 8:00–11:00 a.m.) on home visits. CVs considered communication between CVs and HEWs, mostly done through mobile phones and meetings at the health post, to be adequate. Nonetheless, HEWs stated that communication should be more frequent, supported by a more formal system of mobile phone communication.

The main barrier to institutional delivery, according to CVs and HEWs, was limited transportation, in both directions. Ambulance services are only available for one-way transportation, from home to health center. The lack of transportation from health center to home after delivery is an issue that deters women. The main incentives recommended by CVs during FGDs were mobile phones, umbrellas, torches, bags, and frequent supervision and refresher training. Monetary incentives for CVs, as well as community and institutional recognition for the contribution CVs make to community health, were mentioned only by HEWs. HEWs also noted increased awareness of the project among community stakeholders as a means to promote collaboration with and support from communities. Likewise, they noted that improving communication between CVs and the *woreda* level was important to raise awareness of and address local service bottlenecks that impede maternal and newborn service demand and utilization. Recent users of facility-based delivery services (pregnant and postpartum women) noted that knowledge of obstetric complications (conveyed either by CVs or through ANC visits) was the main reason they sought institutional delivery. Most of the time women decide on the place for delivery. Likewise, participants reported mothers most frequently make the decision to seek care for newborns, with the father only supporting the decision with money.

Severity of newborn illness was associated with continuous crying, fever, and/or not feeding well. Traditional healers were the primary health provider sought for newborn illness. Among mothers who had recently delivered at home, the main reasons for choosing home delivery were lack of transport and/or the cost of transport, culturally based delivery traditions (family support, privacy, and receiving care from TBAs/female attendants), perceived lack of quality of care at health facilities, and mother-grandmother influences. Women viewed the main benefits of CVs' activities as demand creation for ANC and child immunization, exclusive breastfeeding, and recognition of newborn danger signs. In addition, these women reported that CVs promoted community links with the health system.

Community leaders mentioned user-focused incentives, the availability of transportation, and attendance at delivery by female providers as the most important interventions to increase institutional delivery. They mentioned that their inclusion as social mobilizers within this project was an important vehicle for demand creation and service utilization.

Health providers noted that CVs' most important contribution was the identification and referral of pregnant women in the community. Interestingly, they also mentioned the importance of the change in female patients' attitudes toward male providers. They acknowledged that the increase in use of ANC and institutional delivery correlated directly with project implementation. Other benefits acknowledged were changes in the mothers' knowledge of danger signs, women's willingness to continue ANC without interruption, women's willingness to deliver at health centers, and women coming to the health center for care and support when they identified a potential health problem. Before the project, mothers reported discarding colostrum and

giving camel milk to the newborn, but maternal practices seemed to change for the better during project implementation.

The following quote from a facility-based trained midwife illustrates the comments received during the in-depth interviews:

"One recently delivered mother brought her newborn with abdominal problems, and when we enquire[d] about the causes, she told us that she gave a water and sugar mixture to the child. Then after treating the baby, we provided her with key postnatal messages and she told us that she had received similar key messages from CVs but didn't practice it accordingly and her child got sick. She now regrets not practicing what she was told by CVs."

Discussion

Quantitative data from the study indicate that community-based pregnancy surveillance can be achieved rapidly and effectively by integrating it into established community-based delivery platforms, such as an NGO immunization program. Within a 4-month period, about three out of five registered pregnant women received ANC and newborn health messages. On the other hand, identification and registration of pregnant women does not always translate into service demand. In this project, there seems to be a gap of about 40% between those initially identified and registered and those who later received ANC and counseling on newborns.

This project also demonstrated an immediate impact on the number of women who sought facility-based delivery services, with demand doubling during the pilot. Problems with estimating pastoralist population size make it difficult to measure the actual number and proportion of women who are pregnant and in need of maternal and neonatal health care services. Addressing this problem will require creative real-time methods to monitor population size and mobility among pastoralist groups. Likewise, it appears difficult for CVs to track individual births and provide timely home visits within the first 2 days of life. Perhaps cellular telephone communications with health facilities and/or transportation providers will help to resolve this challenge.

On the qualitative side, the most important findings relate to the identification of effective messages to increase demand for and use of delivery and newborn services. By targeting pregnant women with counseling on essential care for newborns, the project has the potential to improve care-seeking behavior among mothers for their newborns. However, solutions to the challenges of timely access and high cost of transportation must accompany the counseling intervention. Lack of transportation is a primary barrier to service demand, and the availability of local ambulance transportation contributed to women choosing a facility-based delivery in this project. A second program enabler was the use of cellular telephones by CVs and HEWs to share timely information and notify health facilities and transportation providers.

In this study, participants identified the mother, supported by her husband, as the main decision-maker in seeking care for ill newborns. The rapid increase in the numbers and percentages of women registered, attending ANC, and seeking a facility-based delivery during this brief pilot study suggests that pregnant women are open to changing their health behaviors when they are encouraged and supported by local CVs in the community. This is an important lesson for the design of interventions to increase service demand and thereby decrease newborn mortality in pastoralist populations.

The finding that women are the decision-makers in seeking care is not consistent with results found in other countries. For example, a study in rural Ghana (Hill et al. 2008) found that several people were involved in the care-seeking decision process, and that husbands were key in financial decision-making. Based on the care-seeking patterns of participating women, the strongest barrier to early skilled care seeking was not lack of danger sign recognition, but rather cultural beliefs related to the causes of newborn illness. Studies by Mesko et al. (2003) in Nepal and by Bazzano et al. (2008) in Ghana also found that care seeking in the newborn period was related to cultural beliefs, such as the need to "watch and wait" (Nepal) and the identification of some newborn illnesses as "not for hospital" (Ghana). Stewart et al. (1993) found the ascription of cultural

beliefs (evil forces) to newborn disease, with consequential preference for traditional treatment. It seems that the first preference for newborn care is generally home treatment, as has been reported by multiple studies in Ghana (Bazzano et al. 2008) and Bangladesh (Winch et al. 2005), as well as for children under 5 in Ethiopia (Teka and Dagnew 1995). Most barriers to seeking care outside the home were related either to a sense of fatalism or to a lack of finances for transportation.

Conclusion

The integration of a newborn-related intervention into an immunization delivery platform in a pastoralist area of Ethiopia is operationally feasible, and has the potential to rapidly expand coverage of essential newborn care, including ANC and facility-based delivery. Research is needed to improve methods to track the changing population size and locations of pastoralist groups; to more consistently provide timely local transportation for women who wish to deliver in a facility; and to improve communication between health facilities and community-based CVs in order to increase postpartum care coverage in the home. Finally, to ensure that these mobile populations are part of an effective national maternal and neonatal health system, it is crucial to support integrated local solutions until an accessible, functioning facility-based system is in place.

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