Introduction of Newborn Care within Integrated Community Case Management in Uganda

Christine Nalwadda Kayemba, Hanifah Naamala Sengendo, James Ssekitooleko, Kate Kerber, Karin Källander,
Peter Waiswa, Patrick Aliganyira, Tanya Guenther,* Nathalie Gamache, Clare Strachan, Charles Ocan,
Godfrey Magumba, Helen Counihan, Anthony K. Mbonye, and David R. Marsh

Makerere University College of Health Sciences, School of Public Health, Kampala, Uganda; Saving Newborn Lives, Save the Children, Kampala, Uganda; Malaria Consortium, Kampala, Uganda; Saving Newborn Lives, Save the Children, Cape Town, South Africa; Division of Global Health, Karolinska Instituet, Stockholm, Sweden; Makerere University/Iganga/Mayuge Health and Demographic Surveillance Site, Kampala, Uganda; Saving Newborn Lives, Save the Children, Washington, District of Columbia; Department of Health and Nutrition, Save the Children, Westport, Connecticut; Ministry of Health, Kampala, Uganda

Abstract. Uganda's Ministry of Health, together with partners, has introduced integrated community case management (iCCM) for children under 5 years. We assessed how the iCCM program addresses newborn care in three midwestern districts through document reviews, structured interviews, and focus group discussions with village health team (VHT) members trained in iCCM, caregivers, and other stakeholders. Almost all VHT members reported that they refer sick newborns to facilities and could identify at least three newborn danger signs. However, they did not identify the most important clinical indicators of severe illness. The extent of compliance with newborn referral and quality of care for newborns at facilities is not clear. Overall iCCM is perceived as beneficial, but caregivers, VHTs, and health workers want to do more for sick babies at facilities and in communities. Additional research is needed to assess the ability of VHTs to identify newborn danger signs, referral compliance, and quality of newborn treatment at facilities.

INTRODUCTION

Uganda is accelerating efforts to achieve Millennium Development Goal (MDG) 4 to reduce under 5 years mortality by two-thirds from the 1990 level by 2015.[1] Each year, 141,000 Ugandan children under the age of 5 years die. Of these deaths, 28% occur during the neonatal period.[1] Three additional causes account for another one-half of all child deaths in Uganda: malaria (22%), diarrhea (16%), and pneumonia (12%).[2] Meaningful progress to MDG 4 will require controlling deaths caused by these preventable and treatable conditions. Integrated community case management (iCCM)[3] is a widely adopted strategy to deliver treatment of pneumonia, diarrhea, and malaria through community-based health workers.[4] Given the current and likely future importance of newborns to under 5 years mortality, community-based strategies to address newborn mortality within the context of iCCM are also needed.[5]

In 2008, Uganda's Ministry of Health revitalized and expanded the dormant village health team (VHT) program. A VHT consists of five to six community members who collectively deliver maternal, newborn, and child health and sanitation interventions.[6] The VHT post is volunteer-based, with incentives of training and supervision occasionally supplemented with *ad hoc* donor support. The VHT program includes community case management for treating childhood pneumonia, diarrhea, and malaria in children aged 2–59 months.[7,8] Of the five to six VHT members, two to three member receive additional training in iCCM. The standard iCCM training consists of 6 days of modular, classroom-based sessions using workbook review, discussion, role plays, and practical sessions at a health facility, where trainees learn to assess, classify, and treat sick children.

In recognition of the importance of newborn mortality to overall child mortality and the growing evidence base for community-based newborn interventions, a newborn preventive care component was included as part of Uganda's iCCM pro-gram. To develop the package of care for babies 0–59 days, architects of the current VHT and iCCM strategy drew on findings from the Uganda Newborn Survival Study (UNEST) and global evidence.[9–12] Because up to three-quarters of neonatal deaths take place during the first week of life, the VHTs are trained to make home visits on days 1, 3, and 7 after birth and refer sick newborns to health facilities with extra supportive care at home for small babies (Panel 1).[13,14]

The Ugandan Ministry of Health is scaling-up iCCM with support from partners like Malaria Consortium and United Nations Children's Fund (UNICEF). The iCCM strategy in Uganda is among the first globally to include preventive care from birth; however, how successfully the strategy has delivered newborn care is not known. The aim of this paper is to describe how newborn care is addressed within iCCM implementation in Uganda and the perceptions of VHT members, facility-based health workers, and family members relating to newborn care in the context of community-based treatment of illness for older children. The paper identifies what is lacking for newborn care in the current strategy, describes stakeholder perceptions of the larger iCCM context in which newborn care is nested, and provides recommendations to address gaps.

MATERIAL AND METHODS

Study design. In this cross-sectional survey, we used qualitative and quantitative methods in three midwestern districts of Uganda, Kiboga (population 109,000), Kyankwanzi (population 121,000), and Hoima (population 344,000), where Malaria Consortium is implementing and evaluating iCCM (Figure 1).[15] These districts were selected, because they had sufficient numbers of trained VHT members who had been implementing iCCM for at least 5 months.

Ethics. The study was part of the formative research of the inSCALE project, which aims to understand community health worker (CHW) performance and motivation, community uptake and use of CHWs, and challenges to ICCM implementation in Uganda and Mozambique. The study protocol was approved by the Institutional Review Board of Makerere University School of Public Health and the Uganda National

*Address correspondence to Tanya Guenther, Department of Health and Nutrition, Save the Children, 2000 L. Street NW, Washington, DC 20036. E-mail: tguenther@savechildren.org

PANEL 1. Newborn care within VHT and iCCM training.

Newborn care covered in basic VHT training.
- Emphasize the importance of facility deliveries.
- Record births that take place at home.
- Identify and record newborn danger signs (difficulty breathing, weakness, fever, difficulty feeding, umbilical cord is red or discharging pus, convulsions, and vomiting).
- Encourage routine postnatal checks at the health facility at 6 hours, 6 days, and 6 weeks after birth.
- For babies born at home, practice immediate essential newborn care (dry the baby, wrap the baby, ensure that breastfeeding is initiated, check for danger signs every 1 hour, and refer if needed).
- Make home visits to the newborn after delivery: first visit within the first day after delivery, second visit on the third day after delivery, and third visit on the seventh day after delivery.
- Advise the mother and the family on healthy newborn and maternal practices, including early and exclusive breastfeeding, thermal care, clean and dry cord care, immunizations, skin to skin care, and extra breastfeeding support for small babies.

Newborn care instruction provided during iCCM training.
- Initiate breastfeeding soon after delivery within 1 hour and breastfeed exclusively.
- Delay the first bath, and wrap baby in warm clothing to prevent low body temperature.
- Recognize very small babies and give extra care.
- Mothers and other caregivers should always wash hands before breastfeeding or handling the baby.
- Check on the cord regularly and ensure that it is clean and dry.
- Follow-up of the newborn in the community by the VHT member.
- Make home visits to the newborn after delivery: first visit within the first day after delivery second visit on the third day after delivery, and third visit on the seventh day after delivery.
- VHT should take opportunities such as child health days to actively look for sick newborns.

Council of Science and Technology (HS 875). All participants were informed of the study purpose and objectives and that participation was purely voluntary with no penalties to the respondent in case s/he declined to participate or dropped out at any time. After this discussion, each respondent was individually asked to sign a consent form authorizing their participation in the study.

Individual interviews and focus group discussions with VHTs. The total number of VHT members trained in iCCM in the three study districts was 1,992. Using the Kish formula and a prevalence of 50% for our primary indicator, which is the proportion of trained VHT members who show knowledge of newborn care messages for well and sick babies, we estimated a sample size of 384.[16] We added 10% (38) for nonresponse to reach a total of 422 as our target sample size for individual VHT interviews. We distributed the sample of VHT members proportional to the number trained in each district (215 VHT members from Hoima, 113 VHT members from Kiboga, and 94 VHT members from Kyankwanzi). We randomly selected one-half of the subcounties in Hoima (five), Kiboga (three), and Kyankwanzi (three). Within each selected subcounty, we randomly selected 9–11 parishes and interviewed all the iCCM-trained VHT members in those parishes. We used a structured questionnaire translated into the local language (Lunyoro) and back-translated to English to inquire about the training the VHT members received and their knowledge of newborn care.

In addition to the individual VHT interviews, one focus group discussion (FGD) per district was conducted with VHT members. We randomly selected one subcounty and one health facility and invited seven to nine VHT members supervised by the selected facility to participate. Health assistants at the facilities recruited the VHT members for the FGDs. The themes discussed included the role of VHTs within iCCM; newborn care offered by VHT members to sick and well newborns; key messages related to newborn care; record keeping; supervision; motivation; challenges faced within the iCCM program; and perceptions about the overall iCCM program.

Health worker (in-charges) in-depth interviews. In-depth interviews (IDIs) of health facility in charges were conducted in four health facilities in each district to represent all levels of the health system: hospital and health center IV, III, and II. The in-charges in the selected facilities were recruited to participate, with the exception of one health center IV where a midwife participated for an in-charge who was not available. All IDIs were one on one with the exception of one hospital, where two health workers in charge of the community health department were interviewed together. Themes explored in the health worker interviews included awareness about iCCM generally and newborn activities specifically; supervision activities; newborn referral within iCCM; record keeping; and perceptions about VHTs and their role in newborn care.

Key informant interviews. We interviewed three district personnel in charge of iCCM activities in the districts and one staff of the implementing partner (Malaria Consortium). The issues explored were the same as those issues examined with the facility-based health workers.

Caregiver focus group discussions. All health facilities in each district were listed on a piece of paper, and two facilities were randomly selected from each district, one to recruit female caregivers and the second to recruit male caregivers for a total of six FGDs of seven to nine participants each. This sampling was done so that the caregivers were not from the same households. To be eligible, the caregiver had to live in the district and have a living child less than 3 months of age. The health assistants at the health facilities mobilized participants from the catchment area of each health facility. Themes explored in the FGD included knowledge about available community programs for children and newborns; roles of community members in health activities; general knowledge about newborn care and danger signs; actions taken when newborns are sick; and perceptions about VHT members and their role in newborn care.

Document review. We reviewed the national iCCM implementation guidelines, training manuals, registers, supervision checklists, and job aids used by VHTs and health workers to understand how the newborn care was designed to be implemented within the VHT and iCCM context.

Data collection and management. Study tools were pretested in the Kawempe division of Kampala district and adjusted accordingly. A total of seven local research assistants were recruited and trained for 2 days on the study objectives and use of study tools. Quantitative data were coded and entered electronically, and they were analyzed using STATA version 10. Qualitative data from in-depth interviews and FGDs were tape-recorded, transcribed, and translated into English. The findings were reviewed daily, and probes were
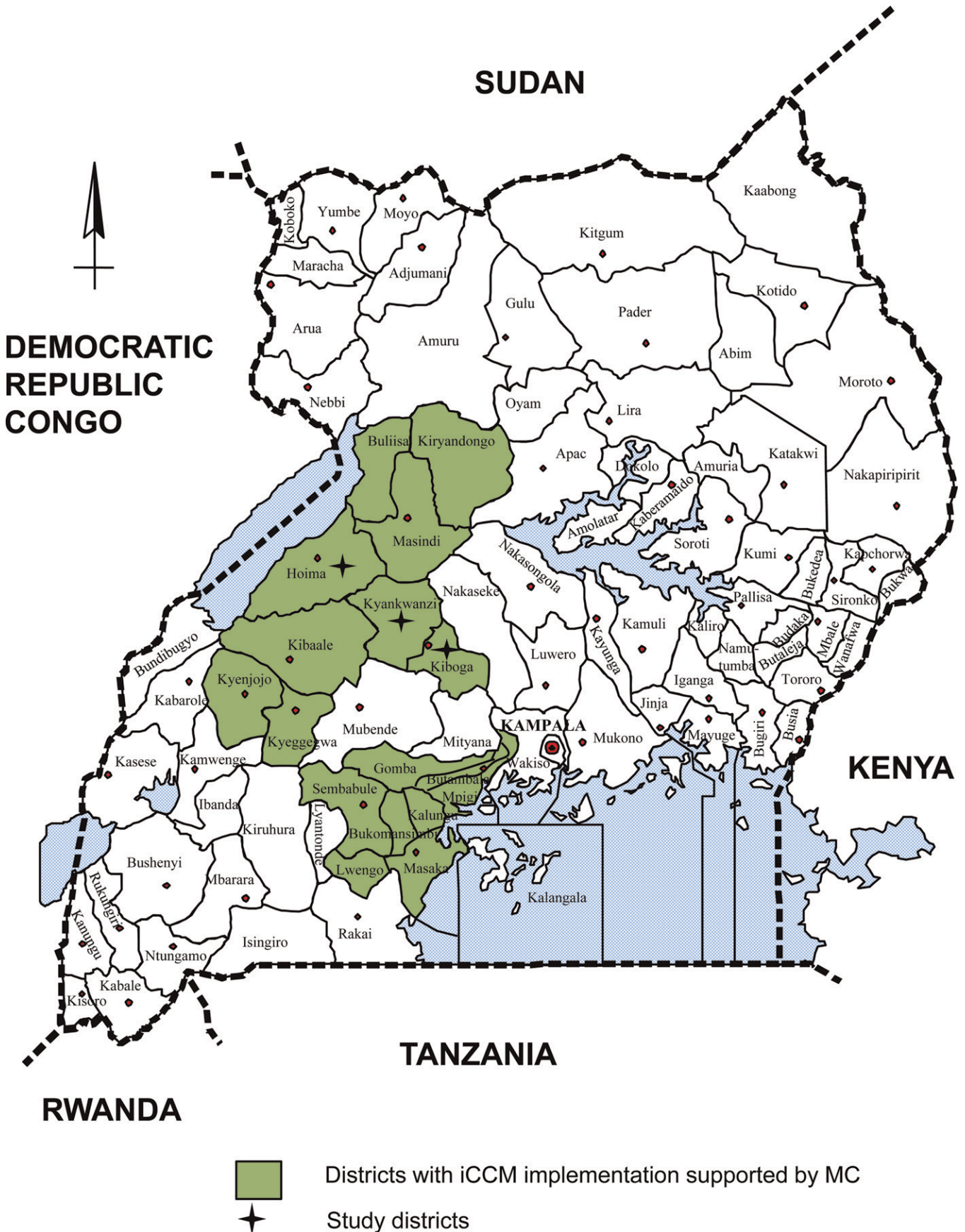
FIGURE 1.   Map of Uganda identifying districts covered by iCCM.

slightly modified to follow up and clarify newly emerging or anticipated findings. Analysis was done using conventional qualitative content analysis.

RESULTS

Characteristics of VHTs. Individual interviews were completed with a total of 436 VHT members (196 from Hoima, 101 from Kiboga, and 139 from Kyankwanzi). In the study setting, men and women serve as VHT members in almost equal numbers (53% male). Nearly 60% of VHT members had completed at least some secondary education, and 81% of VHT members were married. The majority of VHT members (61%) reported holding a position of leadership in their communities as members of the local executive councils, leaders in schools or churches, or workers in other health programs such as mobilization for family planning.

All of the VHTs received 6 days of training in the basic VHT package of health promotion before commencing service as VHT members and an additional 6-day training in iCCM. VHT parish coordinators (peer supervisors) and VHT members with additional responsibilities received a 14-day training. After the training, the VHT members were equipped with medications, including artemisinin combination therapy for malaria and rectal artesunate for severe malaria, amoxicillin tablets for pneumonia, and oral rehydration solution and zinc for treating diarrhea. Additionally, they were equipped with rapid diagnostic tests for malaria, gloves, a respiratory timer, a sick child job aid, and a register.

Newborn care concepts and skills in VHT and iCCM training. Preventive newborn care is covered in iCCM and basic VHT training (Panel 1). The newborn danger signs listed in the VHT sick child job aid include fever, infected cord, lethargy, convulsions, failure to breastfeed, chest in-drawing, and skin pustules (Supplemental Figure 1).[17] The VHT members are trained to immediately refer to the nearest health facility any newborns with the danger signs specified in their job aid. The time allocated to cover newborn care is 2 hours on the last day of the 6-day iCCM training, and it focuses on newborns 0–7 days old. Clinical practice sessions do not include a newborn case, and newborn content is not covered in the post-test.

All the VHT members trained in iCCM reported that their training covered preventive care and how and when to refer sick babies for additional care. Despite the limited training time for the newborn, three-quarters (76%) of VHT members reported that the training was long enough to gain knowledge and skills. Of those VHT members who reported that the period of training was not adequate, 60% suggested that the training period should be up to 14 days. Although the length of training was deemed sufficient by most VHT memners, there were concerns expressed about the need to upgrade skills periodically.

Early preventive and promotive care for newborns. The VHT strategy in Uganda includes preventive visits at specific time points during pregnancy and in the first week after birth, necessitating active surveillance by VHT members with support from community members and health facility staff.[6] VHT members identified pregnant women through various means (Table 1), most commonly (78%) by observing women's physical and behavioral changes. Most VHT members (67%) learned of deliveries by notification from community members. Only 10.9% reported receiving information on births directly from health facilities.

TABLE 1
Methods used by VHTs to identify pregnant and newly delivered women and babies

Methods	Frequency (%)
Methods used by VHTs to identify pregnant women*	
Seeing pregnancy	224 (51.6)
Home/follow-up visits	143 (33.0)
Body and behavioral changes	116 (26.7)
Mother comes for consultation about ANC	73 (16.8)
Health educational meetings in villages	61 (14.0)
Information from other community members	41 (9.5)
Through health facility maternity unit	19 (4.4)
Methods used by VHTs to identify newly delivered women and babies*	
Notification by community members	274 (63.4)
Close monitoring of pregnant women	164 (38.0)
Home visits	143 (33.1)
Visiting health facilities to get list of newly delivered women	47 (10.9)
Through friends and relatives	16 (3.7)

*Multiple responses elicited.

Most VHT members (73%) reported that, during home visits in the first week of life, they congratulate the mother and ask to assess the baby. The most common aspect of preventive care cited was promotion of exclusive breastfeeding (67%). Less than one-half of VHT members mentioned counseling on the importance of keeping the baby warm (45%) and hygienic practices (38%) or asking the birth weight (32%) or date/time of delivery (14%). Few (4%) VHT members reported repeat home visits for newborn care.

Identification and referral of sick newborns. Two-thirds (65%) of VHT members reported checking the baby's skin and cord and assessing for danger signs during routine home visits, but fewer than 1 in 10 (9%) VHT members reported advising mothers about prompt care-seeking for danger signs. The majority of VHT members (87%) could name three or more newborn danger signs, but they were not necessarily the signs that best predict severe illness. Infected umbilical cord (81%) and skin rash (69%) were the two most frequent responses. Fewer than one-half (43%) of VHT members mentioned failure to breastfeed, one of the most important newborn danger signs.

Nearly all VHT members (99.8%) mentioned that they would refer a sick newborn to the nearest health facility, which is in line with iCCM program guidelines. Participants in FGDs emphasized that, as VHT members, they were not supposed to treat sick newborns but only refer them to health facilities:

"During the training, we were told not to treat the newborns at all; we just refer them to the health workers in the health units."—VHT FGD (Kyankwazi).

Caregivers also knew that VHTs do not treat newborns but rather assess them and refer to the nearest health facility if the baby is sick.

"When you take the newborn to the VHT, she checks the baby and registers it, but she does not give drugs. She gives you a referral to take to the health unit."—caregiver FGD (Kiboga).

Almost all VHT members (96%) believed that caregivers comply with referrals and that newborns receive treatment at

health facilities when referred. Some caregivers' VHTs were an extra step along the way to receiving care for their sick babies:

"VHTs do not have drugs for newborns. We take them [to the VHT], but they just tell us to go the health facility, because they do not have the drugs for newborns ... We know VHTs do not have drugs for newborns so we just take our babies wherever is convenient for us."—caregiver FGD (Kyankwanzi).

Health workers also believed that caregivers complied with VHT referrals. A referral note issued was perceived to facilitate compliance to referral.

"Yes, they do [comply], because those that come bring with them the referral notes or if not, a referral is written on a piece of paper."—health worker IDI (Kiboga).

However, some health workers mentioned that some referrals were not complied with because of barriers such as transport, cultural beliefs, and misconceptions about the services provided.

Similarly, some VHT members also mentioned several reasons why caregivers may not comply with referrals for their newborns: failure to obtain money for transport (32%), lack of medicines at the health facility (24%), long distances to the health facility (20%), and cultural barriers (9%). Caregivers reported being frustrated after complying with a referral only to find that the necessary medicines were not available at the health facility.

"It is like we do not have a program for the newborns here in Kyankwanzi. Even if we go to the health facility, there are no drugs."—caregiver FGD (Kyankwanzi).

Two-thirds of VHT members (68%) reported receiving direct feedback from health workers concerning referred newborns, and only one-third (34%) reported following up the newborns at home after recommending referral to check on the status of the mother and baby.

Supportive supervision and program documentation. Facility-based health workers are responsible for training and supervising the VHT members in their catchment areas, distributing drugs to them, and checking their registers. Three-quarters of VHT members reported receiving a monthly supervision visit, usually by the Parish Coordinator (a VHT who received additional training), the in-charge at health facilities, and/or the Malaria Consortium staff. This supervision visit focused on observation of a sick child with no specific provision for a routine newborn care visit, which is in line with the iCCM supervision checklist (it does not include any newborn-specific content). One in six (17%) VHT members reported no supervision at all and during the FGDs, and some health workers noted that supervision had become irregular.

Over 98% of the VHT members reported keeping household registers that captured information on pregnant women and newborns including the expected delivery date, antenatal care attended, danger signs observed, outcome of mother at delivery, place of delivery, and postnatal checks received at a health facility. VHTs trained in iCCM also fill out the sick child form, identifying the date of visit, name of the child, period of illness, presence of a danger sign, respiratory rate, and referral notes for the sick newborn, which indicate the date and time of referral and the danger sign as well as home visits on day 1, 3, and 7 after birth. The outcome of the newborn referral is not captured, although it is for children 2–59 months (Supplemental Figure 2).[18] The majority of the VHT members (97%) mentioned that they give the records to the Parish Coordinator on a monthly basis.

Motivation of VHT members and overall perceptions of the program. In the IDIs, VHT members mainly reported satisfaction with their current role and responsibilities. Motivators included allowances for meeting attendance (32%), ability to help community members (30%), transport (26%), and availability of drugs (17%). When asked what would make them stop working as VHT members, 43% said that nothing would convince them to quit. Others mentioned unreliable drug supply (15%) and lack of allowance (14%). However, some VHT members expressed concern about the inability to treat sick newborns.

"The program is not good concerning newborns, because we cannot treat them." —FGD VHT (Kyankwanzi).

Similarly, VHT members prioritized the challenges that they face as delays in receiving drugs and other supplies (59%), lack of transport (47%), interference with personal work (30%), and lack of lighting at night (25%) (Table 2).

Overall, health workers perceived the iCCM program positively. In addition to saving lives and reducing illness, the program was felt to have strengthened the relation between health workers and the VHT members, and it increased childhood immunization rates. They felt that the program could be used to fill other gaps, such as distributing treated mosquito nets to women who may not attend antenatal clinics.

Similarly, both male and female caregivers gave positive feedback about the iCCM program, particularly the routine VHT visits to newborns, especially those babies born at home.

"If you give birth in the village, VHT come and see your baby and advise you to take the baby to the hospital."—caregiver FGD (Kyankwanzi).

Community members also described how community members support VHT members in different ways.

"They [VHT members] are not paid; they don't ask us for money, so we give them lifts on our motorcycles and even bicycles or some money; in such a way, we are helping them to do their work."—caretaker FGD (Hoima).

TABLE 2
Most critical challenges faced by VHTs as they perform their work

Challenges faced by VHTs*	Frequency (%)
Delayed supply of drugs/supplies	255 (59.0)
Lack of transport	203 (46.7)
Interference with personal work	129 (29.8)
Lack of lighting source at night	110 (25.4)
Lack of allowances/low facilitation	73 (16.9)
Community members demand treatment of children who test negative for malaria	59 (13.6)
Caretaker not complying to dose given to children	58 (13.4)
Long distances	38 (8.8)
People think VHTs are paid	22 (5.1)
Language barriers	10 (2.8)
Lack of supervision	8 (1.9)
Lack of feedback from health facilities	8 (1.9)
Lack of recognition from supervising health facility	4 (0.9)
Absence of health workers at heath facilities	2 (0.5)

*Multiple responses elicited.

However, the community members also had concern regarding drug supply, inadequate numbers of trained VHT members per village, and difficulty identifying VHT members in the village. They also pointed out that, because the VHTs are not paid, they should be motivated with transport such as bicycles, especially to undertake routine home visits for newborn care.

DISCUSSION

The iCCM program in Uganda, one of the first to include a newborn component, presents an important learning opportunity. Our study used a mix of qualitative and quantitative methods to assess the early implementation experience in three districts of Uganda. The integration of newborn care and CCM for older children provides an opportunity for harmonized service delivery and greater impact in terms of lives saved, but it is not without challenges. These challenges, which are outlined below, include some specific to the addition of the newborn to iCCM and some more general to iCCM.

Limited newborn care within iCCM training and supervision. Although VHT members were knowledgeable in preventive newborn care messaging, home visit schedule, and guidelines for referral, their knowledge of newborn danger signs and messages around care-seeking for newborn care was lacking. Seven danger signs are associated with severe illness in infants less than 2 months of age: history of difficulty feeding, history of convulsions, movement only when stimulated, respiratory rate of 60 breaths per minute or more, chest in-drawing, temperature of 37.5°C or more, or temperature below 35.5°C.[19] These signs are covered in the training and VHT job aid with the exception of low/high body temperature, which is difficult for community workers to recognize without a thermometer. However, the training for newborn care is brief; it is at the end of a 6-day training, it is not assessed during training, and it is not reinforced through clinical practice sessions or supervision. In addition, the focus is on newborns aged 0–7 days, and it does not cover the entire newborn period. During interviews, few VHT members mentioned all of these evidence-based signs, and very few (less than 1 in 10) reported emphasizing to caregivers the importance of care-seeking if they encounter these signs. Because the routine home visits are conducted during the first week after delivery, promotion of family-initiated care-seeking is also important. Most VHT members acknowledged the importance of the early home visit, but few mentioned critical aspects such as assessing the baby's birth weight and breastfeeding.

These findings indicate a need to further strengthen the newborn care component within the iCCM training, implementation, and supervision. Integrating newborn content throughout the training, including newborn cases in the clinical sessions, and covering the full newborn period would help prioritize the newborn and should more reliably impart knowledge and skills to VHT members. VHT members expressed a clear need for consistent supervision as well as opportunities to refresh their newborn care skills. Newborn-specific content should be added to the existing iCCM supervision checklist, and facility staff should be trained to provide supervisory support to the newborn component of iCCM. We found a cadre of VHT peers (Parish Coordinators) not mentioned in the national iCCM implementation guidelines. This cadre of supervisor was useful in coordinating VHT activity at the parish level and improving linkages with health workers, and their role could be further explored.

Timely identification of newborns. In low-income countries, a postnatal home visit within the first 2 days of life by trained CHWs can reduce neonatal mortality.[20] To achieve this early home visit, VHTs require a system for identifying pregnant and newly delivered women. A 2009 assessment of the basic VHT preventive care package (not including iCCM) found that home visits for pregnancy and newborn care were rarely carried out, and specific newborn care training and counseling materials were lacking.[8] Even in research settings with routine home visits, trained enumerators may only capture up to two-thirds of the estimated live births.[21] Waiting to observe bodily changes in women to identify pregnancies and relying on community members to notify VHT members about newly delivered mothers and babies may be even less reliable, and it risks missing the poorest, hardest to reach, and most vulnerable community members. Innovative solutions, such as cell phone notifications from health facility or family members to the appropriate VHT member, are needed to reduce the delay in identifying newly delivered women and babies.

Referral follow-up and quality of care for newborns. Compliance with referral for sick newborns was perceived as high by VHT members and health facility staff. Even if referral compliance is as high as perceived, there is still a need for trained service providers, essential medicines, and equipment at receiving facilities. Previous studies show that families face difficulties in seeking care for their sick children and receiving quality care at health facilities.[22,23] Uganda's national standards and implementation framework for newborn care services stipulate that antibiotics to treat newborn infection should be available at the first-level health facilities (i.e., HCII), but this stipulation has not been operationalized.[24,25] Ill newborns deteriorate faster than older children, and quick action is needed when critical danger signs are present. It is not clear from the results whether there is a sense of urgency around newborn referral by either caregivers or health providers. The lack of essential drugs and health providers competent in newborn case management at the lowest level may result in delays in reaching a higher-level facility equipped to care for newborn illness.[26] This lack has the potential to undermine the VHT member who referred the family at the outset.

A potential concern with implementing different care guidelines for various age groups in iCCM (i.e., treatment or referral) is that VHTs may feel pressure to treat sick newborns instead of referring them for similar problems that they are able to treat in older children. However, virtually no (1%) VHT members reported actually treating sick newborns. This positive finding should be validated through routine supervision that ensures that current referral guidelines are followed.[26]

The lack of follow-up for referred newborns by VHT members is also an important gap that may contribute to a false sense of security about referral compliance as well as the quality of care provided at the health facility. The iCCM training guideline states that "after referral of a child, it is important to follow-up this child the next day."[7] However, this guidance is geared to older children and should specify a follow-up visit for referred newborns as well. Although the routine home visits are scheduled to take place during the first week of life, which is the period of highest risk, families also need to be counseled on how to identify and seek care throughout the neonatal period, because the majority of sepsis cases occurs after this first week.

Balancing treatment of older children with preventive home visits for newborn care. The newborn protocol calls for

VHT members to visit all newborns several times within the first week of life, which is in contrast to the protocol for older children, where families are expected to seek care from the VHT members when a child is sick. These preventative home visits may be viewed by volunteer VHTs as extra work that takes them away from their other responsibilities to provide curative services for older children. Difficulties identifying births and frustration at being unable to provide treatment of sick newborns may also drive VHT members to focus on the curative component. More research is needed to better understand how to balance these often competing demands.

Collection and use of newborn care indicators. Relevant newborn indicators are captured through the VHT registers and the supervision checklists, and one core indicator specific to newborn care is captured at the national level (proportion of newborns visited at home on day 1, 3, and 7). At the time of data collection, the Malaria Consortium was in the process of installing a data collection system to use data more effectively during supervision to improve VHT services and at the district level, to link community- and facility-based care for sick children as well as newborns. One simple addition to the register would be to include the outcome of referral of the sick newborn, similar to how it is captured for older children. This addition will identify whether families comply with referral and whether the newborns recovered. Linking the identification of pregnant women (through antenatal care [ANC] registers or active surveillance) to VHT members responsible for iCCM could enable reaching mothers and babies early during the first week after birth.

Our study also identified challenges to the iCCM program as a whole, including difficulties in providing regular supervision, ensuring a regular supply of drugs at community and health facility level, maintaining motivation of VHT members, and improving training tools and methods so that CHWs provide correct advice and identify most important danger signs. Although newborns are not treated by the VHTs, at the time of the study, there were stock outs of drugs and supplies needed by VHT members to treat older child illnesses because of much higher consumption than anticipated, especially for antibiotics. Supply chain management and the commitment to procure and distribute medicines for iCCM are important to maintain program credibility and motivate VHT members. Despite these challenges, the newborn component can be considered well-positioned within the iCCM program in Uganda. The positive reputation and branding of the iCCM program seems to be beneficial; although young, iCCM is well-known and respected as evidenced by positive feedback from community members.

There are some limitations to this study. Our assessment relied on knowledge, attitudes, and perceptions of VHTs, caregivers, health workers, and key stakeholders pertaining to the iCCM program. The VHTs were not administered a competency assessment of sick and normal babies using a case scenario or observation of a home visit, which limits assessing true clinical knowledge and skills. Additionally, referral compliance was not verified, and the caregivers interviewed were limited to those caregivers with live children because of the additional sensitivity involved in talking to parents with children who had died. Despite these limitations, this study examined the implementation experience of the often-overlooked aspect of newborn care within fast-growing iCCM programs and identified areas for strengthening that can be applied in Uganda and similar settings (Panel 2).

PANEL 2.   Recommendations for improving newborn care within iCCM.

Training recommendations.
- Specify the national schedule for visits during pregnancy as well as the first week of life and clearly delineate roles where other VHT members are providing the pregnancy home visits.
- Emphasize the importance of identifying pregnant women and newborns to successfully adhere to the postnatal home visit schedule.
- Highlight the most important preventive messages (e.g., early and exclusive breastfeeding, thermal care, and dry cord care) and critical danger signs for newborn care (e.g., history of difficulty feeding, history of convulsions, movement only when stimulated, fast breathing, chest in-drawing, baby too hot, and baby too cold).
- Provide a short refresher during iCCM training on newborn care, including extra care for small babies.
- Highlight the need for follow-up of referred newborns by the VHTs.
- Include the parish coordinator cadre in the policy document and introduce the supervisor in training to improve accountability of supervision.

Policy and programmatic recommendations.
- Consider use of small incentives (allowance, support for transport, and supplementary materials) to VHTs, especially those VHTs tied to routine care, to incentivize home visits.
- Consider updating the routine home visit recommendations to include a weekly routine preventive home visit between days 7 and 59 when babies are particularly at risk of infection but out1of the age range for first week home visits and treatment through iCCM.
- Consider innovative strategies to reach distant VHTs for supervision.
- Improve newborn care aspects of supervision visits, specifically reviewing documentation and counseling messages.
- Continue to improve communication between implementing partners, health workers, and VHTs.

Future research agenda. There is a need for further study to assess VHT skills in preventive newborn care, danger sign messaging, and correctly identifying newborn danger signs. Additionally, more research is needed to determine the effectiveness of VHTs in identifying pregnant and newly delivered women; compliance by VHT members with the home visit schedule and factors that can enhance coverage; compliance of families with newborn referrals; and appropriateness of treatment received at the facility for those individuals who do seek care.

Conclusion. As one of the first national adaptations of iCCM to include newborn care, Uganda's experience is important for other settings considering service integration across the continuum of care. The national iCCM program is highly appreciated by stakeholders, including caregivers, VHTs, facility-based health workers, and district personnel. The program is perceived to have improved the health outcomes of sick newborns and older children. The distinction between care provided for newborns and the care provided to older children by the VHT members through iCCM is understood by the majority of stakeholders, although it may pose some logistical and policy challenges. Challenges remain at

each step. VHTs need to know (1) whom to visit, (2) how to deliver the content of the routine visit, (3) how to assess all danger signs, (4) when to refer and how to facilitate and follow-up recommended referral. Additionally, staff must be (5) trained and (6) equipped and supplied to deliver newborn case management. The health information system must be (7) able to capture reliable, timely data on service delivery and availability of essential supplies and equipment. Maintaining motivation of VHTs will be important to continue addressing as the program matures. In addition to known benefits for older children, iCCM has potential to improve newborn survival in communities where it is being implemented.

Authors' addresses: Christine Nalwadda Kayemba and Peter Waiswa, Makerere University College of Health Sciences, School of Public Health, Kampala, Uganda, E-mails: cnalwadda@musph.ac.ug and pwaiswa2001@yahoo.com. Hanifah Naamala Sengendo and Patrick Aliganyira, Saving Newborn Lives, Save the Children, Kampala, Uganda, E-mails: h.sengendo@sciug.org and p.aliganyira@sciug.org. James Ssekitooleko, Karin Källander, Clare Strachan, Godfrey Magumba, and Helen Counihan, Malaria Consortium, Kampala, Uganda, E-mails: j.ssekitoleeko@malariaconsortium.org, k.kallander@malariaconsortium.org, c.strachan@malariaconsortium.org, g.magumba@malariaconsortium.org, and h.counihan@malariaconsortium.org. Kate Kerber, Saving Newborn Lives, Save the Children, Cape Town, South Africa, E-mail: kkerber@savechildren.org. Tanya Guenther and Nathalie Gamache, Department of Health and Nutrition, Save the Children, Washington, DC, E-mails: tguenther@savechildren.org and ngamache@savechildren.org. Anthony K. Mbonye, Ministry of Health, Kampala, Uganda, E-mail: akmbonye@yahoo.com. Charles Ocan and David R. Marsh, Department of Health and Nutrition, Save the Children, Westport, CT, E-mails: cocan@savechildre.org and dmarsh@savechildren.org.

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