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Federal Democratic Republic of Ethiopia
Ministry of Health

ETHIOPIA

SC4CCM Project Endline Evaluation Report

July 2014

SC4CCM
Supply Chains 4 Community Case Management

JSI

Milken Institute School of Public Health
THE GEORGE WASHINGTON UNIVERSITY

Ethiopia

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July 2014

SC4CCM Project

The Improving Supply Chains for Community Case Management of Pneumonia and Other Common Diseases of Childhood Project is funded by the Bill & Melinda Gates Foundation under grant agreement no. OPP1002868, beginning November 2, 2009. The grant is implemented by JSI Research & Training Institute, Inc. The project aims to demonstrate that supply chain constraints at the community level can be overcome, and that doing so may yield significant improvements in the effectiveness, scale, and impact of iCCM. SC4CCM will identify, demonstrate, and institutionalize supply chain management practices that improve the availability and use of selected essential health products for treating children under five in community-based programs.

Recommended Citation

SC4CCM Project Team. 2014. *Ethiopia SC4CCM Project Endline Evaluation Report, July 2014*. Arlington, Va.: SC4CCM.

Cover photo: A health extension worker (HEW) in Amhara Region, Ethiopia completes her reports

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Acronyms

ACT	artemisinin-based combination therapy (Coartem)
ARI	acute respiratory infection
BL	baseline
CCM	community case management
EL	endline
FEFO	first expired, first out
FMOH	Federal Ministry of Health
HC	health center
HCF	health care financing
HEW	health extension worker
HIV	Human Immunodeficiency Virus
HP	health post
HPMRR	Health Post Monthly Report and Resupply Form
iCCM	Integrated community case management
IPLS	Integrated Pharmaceutical Logistics System
JSI	JSI Research & Training Institute, Inc.
LIAT	Logistics Indicator Assessment Tool
MOH	Ministry of Health
OJT	on-the-job training
ORS	oral rehydration salts
PFSA	Pharmaceutical Funding and Supply Agency
PHCU	Primary Health Care Unit
PI	principal investigator
RDT	rapid diagnostic test
RHB	Regional Health Bureau
RRF	Report and Requisition Form
RUTF	Ready-to-Use Therapeutic Foods
SC4CCM	Supply Chains for Community Case Management
SCM	supply chain management
SOP	standard operating procedures
TB	tuberculosis
TOT	training of trainers
WoHO	Woreda Health Office
ZHD	Zonal Health Department

Acknowledgements

Over the five years of the SC4CCM Project remarkable achievements have been made in Ethiopia towards strengthening the supply chain for community health products. These achievements could not have been achieved without the support, dedication and collaboration of all the partners. In particular, the SC4CCM Project would like to acknowledge the hard work and commitment of the Ethiopian Federal Ministry of Health (FMOH) and the Pharmaceutical Fund and Supplies Agency (PFSA) who supported the work from the outset and built a collaborative and cohesive environment among stakeholders to work towards one common goal. All FMOH and PFSA staff from the central, region, zone, woreda, health center and health post levels should be congratulated for their efforts in supporting the implementation of the Integrated Pharmaceutical Logistics System for health extension workers. The project would also like to acknowledge our partners in evaluation: JaRCo, who managed the quantitative survey data collection for our baseline, midline, and endline evaluations, and George Washington University staff who guided the design of the final qualitative case study and spent weeks in the field interviewing staff. The project would also like to acknowledge the USAID | DELIVER PROJECT and UNICEF who supported the implementation of activities.

Executive Summary

In 2010, the Supply Chains for Community Case Management (SC4CCM) project, with funding from the Bill & Melinda Gates Foundation, set out to increase availability of key drugs and commodities for sick child treatment and management at the community level in three sub-Saharan Africa countries. In Ethiopia, the SC4CCM project had two phases that aimed to understand what it would take to introduce and operationalize the Integrated Pharmaceutical Logistics System (IPLS) in select health posts (HPs) and to integrate supply management of integrated community case management (iCCM) products into the IPLS.

In 2014, an endline evaluation was conducted in phase two sites (direct delivery sites in West Gojam, Amhara and Hadiya, SNNP) focused on assessing the extent to which IPLS had been operationalized at HP level and between HPs and health centers (HCs). The end line evaluation examined the integration of iCCM products into the IPLS as well. The mixed methods evaluation approach used a quantitative survey and qualitative case study method to assess the availability of key iCCM products at the HP level and the operationalization and performance of the IPLS at HP level and between HP and HC. The assessment allowed SC4CCM to identify the approaches that worked to achieve operationalization of the IPLS for HEWs, and how and why the approaches worked.

Key Findings

- **IPLS is to a large extent operational at HPs** in the intervention sites: survey and case study results showed that across all HPs, the indicators for use of the IPLS tools have improved, significantly in many cases, between baseline and endline measurements, with some follow up support still required to promote correct use of bin cards.
- **IPLS is operational for processes between HP-HC and for processes at HCs related to maintaining and resupplying HP products** in the intervention sites: survey and case study results showed that all 31 HCs are now maintaining stocks of key iCCM products and using the IPLS properly and consistently.
- **Successful operationalization of the IPLS for health extension workers (HEWs) required a variety of inputs: training, follow-up and continued support, and leadership.**
    - **IPLS skills training** conducted by HC staff most often needed to be followed up with refresher training. Training was more effective if a participatory and hands-on approach was taken and when SC4CCM and woreda staff were present, as this helped HEWs realize that the IPLS training was important.
    - **Follow-up and continued support** by the health center is needed regardless of the type or quality of the initial training that HEWs receive on IPLS. The evaluation identified four ways that follow-up had been provided in various combinations to HEWs based on their need: refresher trainings at the HC, regular problem solving discussions at primary health care unit (PHCU) meetings, on-site supportive supervision, and off-site learning when HEWs were collecting supplies.
    - **Leadership** was found to be necessary for the routine and consistent use of IPLS at HP and at HC for HP products. Commitment by the PHCU Director and the Store Manager were critical for ensuring that HC staff valued IPLS for HEWs; these two positions were also an important repository for IPLS skills for both training new staff in the case of turnover and ensuring that HEWs could continue to be supported for correct and routine use of IPLS.

- **Stock imbalances (shortages and overstocking) of iCCM products were common in both HP and HC,** despite some overall improvement in product availability at HPs. The data suggests that having a mostly functional system at HP and HC levels cannot fully compensate for supply imbalances and insufficient attention to IPLS procedures for iCCM products at higher levels. Regional and central level supply chain processes for iCCM products currently use a combination of fixed quantity push and demand based pull supply systems, which results in stock imbalances.
- **Some level of institutionalization of IPLS for HEWs at the PHCU level was evident.** There was some evidence through the case study of outstanding leadership from PHCU Directors and Store Managers that was catalytic to IPLS operationalization and institutionalization. Many PHCU directors were including IPLS for HEWs in routine support activities including in orientation and training of new staff.

Recommendations

Based on the results of the endline evaluation and discussions of the results with relevant stakeholders from the two pilot regions, the following recommendations were jointly developed by SC4CCM and stakeholders in four key areas:

1. **To operationalize IPLS for HEWs**, training for HEWs focused on IPLS at health center is required with follow up and continued support to fill gaps and reinforce skills after the initial training. The follow up and continued support should include a combination of activities depending on the need: refresher trainings at the HC, regular problem solving discussions at PHCU meetings, on-site supportive supervision, and off-site learning.
2. **To scale up IPLS for HEWs**, strong leadership and commitment from the Federal Ministry of Health (FMOH), the Regional Health Bureau (RHB), the Zonal Health Department (ZHD), and the Pharmaceutical Funding and Supply Agency (PFSA) Central and hubs will be necessary to support effective scale up. SC4CCM project inputs will need to be translated into feasible health system functions all the way up the hierarchy, such as including IPLS for HEWs in the regular cascade of supportive supervision at all levels. Implementing partners should include IPLS into their activities and consider supporting such activities such as training HC staff in how to train HEWs on IPLS.
3. **To institutionalize IPLS for HEWs at all levels**, it is necessary to integrate follow up and continued support into already existing structures and routine activities so that IPLS for HEWs can become part of standard business practice. It is also necessary to plan for staff turnover by including IPLS for HEWs in replacement training and training more than one person at the HC in IPLS for HEWs.
4. **To integrate iCCM products into IPLS**, iCCM needs to be considered as a program similar to other programs such as family planning. In this light, there should be dedicated financing for iCCM products, these products should be quantified annually and then procured through PFSA. Procurement should be coordinated among donors, and all procurements based on supply plans that result from the quantification. iCCM products must be pre-printed on report and requisition forms (RRFs) (which is already underway) and supplied to HCs based on the information on this report.

Conclusions

The SC4CCM pilot project demonstrated that it is possible to operationalize IPLS at the HP level and between the HP and HC. The successful operationalization of the IPLS for HEWs required a variety of inputs: IPLS training at HC, follow-up and continued support by HC, and leadership by HC and higher levels. Despite improvements in use of IPLS between HP and HC overall supply issues remain, largely due to the fact that iCCM products are supplied by both push and pull supply systems and different sources of budgetary support for different iCCM products. More work is required to fully integrate iCCM products into the demand-based IPLS from central and regional levels.

Background to the SC4CCM Endline Evaluation in Ethiopia

In 2010, the Supply Chains for Community Case Management (SC4CCM) project, with funding from the Bill & Melinda Gates Foundation, set out to increase availability of key medicines and commodities for treatment and management of sick children at the community level in three sub-Saharan Africa countries, Malawi, Ethiopia and Rwanda. A baseline assessment conducted in the first year of the project (2010) identified key gaps in the community health supply chain, and the project used these findings to design country specific intervention packages to be tested in each country. In Ethiopia, the SC4CCM project aimed to introduce and operationalize an existing supply chain management initiative, Integrated Pharmaceutical Logistics System (IPLS), to the health posts. Phase 1 of SC4CCM in Ethiopia focused on training health center (HC) staff to train health extension workers (HEWs) on the IPLS in eight zones in four regions (Amhara, SNNP, Oromia, and Tigray); in Phase 2, SC4CCM supported the operationalization of the IPLS at HC and health post (HP) level in two zones from the Phase 1 regions, Amhara and SNNP.

In 2013, a midline evaluation was conducted to assess extent of the roll out of trainings to HEWs and the HEW competency as a result of training during Phase 1, and in parallel, a baseline assessment was conducted for Phase 2 sites. The Phase 2 baseline assessment was used to identify focus areas for this phase. An endline evaluation in Phase 2 sites was conducted one year later (2014), which focused on assessing the extent to which IPLS had been operationalized at HP level and between HPs and HCs, and the integration of integrated community case management (iCCM) products into the IPLS. iCCM was first introduced in 2010, and products had been supplied to HPs using fixed quantity kits. iCCM is currently in about 14,500 health posts (> 29,900 HEWs of the 38,000 HEWs in Ethiopia) in Amhara, Oromia, SNNP, Tigray, BG, Gambella, Afar, and Somali Regions. HEWs were supplied with training kits at the time of iCCM training, and since 2011, more than 36,500 training kits have been distributed. Most of the contents of these kits were designed to last for about six months; however, many supplies lasted up to a year due to slow uptake of the service. In addition, 6,500 replenishment kits have been distributed since 2011, and so far have reached only about half of the HPs implementing iCCM.[1] The end line evaluation used a mix of quantitative surveys and qualitative case studies to assess the availability of key iCCM products at the HP level. The evaluation also examined the operationalization and performance of IPLS at the HP level and between HPs and HCs. The evaluation helped identify which approaches used by SC4CCM to achieve operationalization of the IPLS worked and how and why the approaches worked. This report presents findings in each of these areas, based on evidence from both the qualitative case study and quantitative surveys, and recommendations based on these findings.

[1] http://ccmcentral.com/wp-content/uploads/2014/03/iCCMSymposium-Presentation-iCCM-in-Ethiopia_MOH-Ethiopia_2014.pdf

Intervention Description

SC4CCM Project intervention strategy in Ethiopia was divided into two phases, with the second building on activities completed during the first. During Phase 1, SC4CCM, in collaboration with the Pharmaceutical Funding and Supply Agency (PFSA) and the USAID | DELIVER Project, increased supply chain (SC) knowledge, skills, and tools among HEWs consistent with IPLS. The first phase ensured that basic processes and competencies were in place to contribute to incremental improvements in product availability. In the second phase, SC4CCM built on this foundation by strengthening IPLS down to the HP level by supporting HCs and HEWs to operationalize the system by applying their new skills, using tools consistently and by integrating iCCM products into the IPLS from the central level down to the HP, with a goal to improving product availability significantly.

Phase One: Train HEWs in supply chain (SC) knowledge and skills and provide tools using an affordable methodology that results in maximum coverage

The 2010 baseline showed that very few HEWs at HPs and professionals at resupply points had been trained on supply chain management: 13% of HEWs, 6% of HC store managers and 50% of Woreda Health Office (WoHO) logistics officers. The lack of trainings was reflected by low levels of routine supply chain practices. The majority of HEWs (86%) reported using no stock keeping documentation, such as bin cards, at all. Resupply procedures were therefore weak with only 40% of HEWs reporting being regularly resupplied every month. None of the HEWS report using a standard request form.

In response to these findings, in Phase 1 SC4CCM collaborated with PFSA and the USAID | DELIVER PROJECT to design a training approach that was affordable, practical, scalable, and effective in providing basic supply chain skills to maximize the number of HEWs trained. Two different approaches were therefore identified that used existing activities as opportunities to impart supply chain knowledge and skills. These two approaches were:

- A group-training approach during monthly meetings, consisting of IPLS Lessons and Problem Solving modules
- Provision of on-the-job training (OJT) during resupply and supportive supervision

The IPLS Lessons and Problem Solving group training approach used short, self-contained modules that were to be incorporated into the primary health care unit (PHCU) meetings as they were designed, be used individually or in combination, and did not require the participant to have completed any previous lessons. The lessons included time for facilitated problem solving to support the HEWs in implementation of the lessons. The problem solving used a structured approach to identify and prioritize challenges, which then allowed the HEWs to work together to find solutions. The problem solving is seen as a means to empower local PHCU teams to identify and address supply chain issues routinely, to ensure solutions can be appropriate to the local context, and to maximize agility in the system.

Following the Phase 1 midline evaluation, it was recommended that HC staff are taught skills in both group training and OJT; HCs could then use both techniques as appropriate to impart knowledge on IPLS to HEWs.

Phase 1 results are not presented in this report; for more information on Phase 1 visit http://sc4ccm.jsi.com.

Phase Two: Build on the foundational knowledge and skills imparted in Phase One to operationalize the IPLS for HEWs and transition iCCM products into IPLS.

In Phase 2 the project designed a pilot to better understand success factors of implementing IPLS for HEWs, moving forward to strengthen the pull system, and integrating iCCM products into the IPLS. The objectives of this intervention were to:

- Operationalize IPLS at the PHCU level
- Provide technical support to fully integrate iCCM products into the IPLS pull system

While training is very necessary, it was acknowledged that it is not sufficient to fully operationalize a system. SC4CCM and USAID | DELIVER PROJECT worked with PFSA and the Federal Ministry of Health (FMOH) to further build the capacity along the supply chain to perform the key supply chain processes required to ensure products and information flow through the logistics system. Each step of the IPLS supply chain was closely monitored and supported to identify gaps and bottlenecks and adjust processes to improve outcomes. Project staff and woreda staff jointly conducted supportive supervision of HCs and select HPs throughout the pilot. The supervision served to both reinforce skills at HC and HP level but also to transfer skills in supervision of IPLS to woreda staff. Data from supervision was then presented at regular review meetings to track the progress of implementation, identify challenges, and discuss solutions. Two review meetings were conducted with representation from all levels, and one review meeting only focused on zonal health department and regional stakeholders and focused on higher level policy issues that were barriers to full implementation of IPLS for HEWs.

Two additional activities were added during the pilot in response to widespread gaps seen among HEWs during supervision. The first activity added was to conduct a refresher training for HEWs on completion of stock keeping records (bin card) and the Health Post Monthly Reporting and Resupply form (HPMRR). The second activity added was to orient the HP supervisors by providing a one hour orientation on IPLS for HEWs so that skills could be reinforced during the regular supervision.

The second objective of Phase 2 was to explore how iCCM products could be integrated into IPLS from central level down to the HP level. iCCM products were introduced into HPs in 2011, and since that time, they have been distributed to HPs via a fixed quantity kit system, first as training kits and then as replenishment kits, or through ad hoc distribution (often through a push system). During the Phase 2 pilot, SC4CCM worked with UNICEF, PFSA, and FMOH to try and facilitate the transition of some key iCCM products into the IPLS, so that the pilot sites could explore the potential barriers to using this system for distribution. This involved working with donors to channel loose products procured by the donors through PFSA central to the hubs, then to pilot HCs based on the report and requisition form (RRF), and finally to HEWs based on HPMRR for the pilot sites. The project worked to identify and overcome obstacles to that process, including challenges associated with some of these HP products also being products that were part of the revolving drug fund at HC level.

A timeline of activities for Phase 1 and Phase 2 are included in Appendix 1.

Endline Evaluation Methodology

SC4CCM designed innovations to help support implementation and adherence to standard IPLS procedures for recording, reporting, and resupplying of health products to HEWs. The innovations are designed to strengthen the SC at health post level, integrate iCCM products into the IPLS (previously supplied via kits), and to increase product availability at the HP level.

Appendix 2 depicts the conceptual framework used to structure the endline in order to assess IPLS operationalization, institutionalization, and potential scalability in Ethiopia.

Each element in the box and arrow diagram was used to determine the types of data and data collection techniques that would be needed, and which data would be best collected through the Logistics Indicator Assessment Tool (LIAT) survey and which through the case study.

Table 1: Data collection following endline evaluation conceptual framework

Conceptual Framework Element	LIAT survey	Case Study
SC4CCM direct inputs for pilot		X
Training of HEWs	X	X
Competency in IPLS processes (skills and knowledge)		X
HC support to HEWs	X	X
IPLS supervision by woreda and zone		X
Functionality of IPLS processes (operationalization)	X	X
Scalability and institutionalization of IPLS	X (Institutionalization)	X
Improved product availability at HP level	X	X (Perceptions)
Contextual factors		X
Mediating factors		X

The project aimed to test if it was possible to operationalize IPLS for HPs in only two zones; however, the endline evaluation aimed to collect information to understand to what extent in the pilot sites had IPLS been institutionalized and if the approaches used to achieve operationalization could potentially be scaled to all HPs in Ethiopia. We used the following definitions for scalability and institutionalization:

Scalability *is the ability to replicate a proven supply chain innovation and extend that innovation broadly and successfully, through thoughtful implementation design and advocacy, to be adapted and adopted to support the national iCCM program, while achieving the desired benefits of improved product availability.*

Institutionalization *occurs when the innovations that have been developed and proven successful are adapted for and integrated into the structure and systems of the organization responsible for providing and supporting iCCM services, in most cases the Ministry of Health (MOH), and that the innovation becomes a standard business practice of the organization.*

The process of implementing or scaling up can produce factors that contribute to institutionalization and vice versa. The main distinguishing feature between scalability and institutionalization is the approach taken to ensure a shift in responsibility for and ownership of the innovation by a dedicated supply chain management (SCM) organizational unit within the MOH. Institutionalization is also considered a pre-requisite for ensuring that any gains in supply chain performance, namely product availability, associated with the innovations can be sustained.

SC4CCM considers that to be sustainable, the innovation that becomes a standard practice should be part of an integrated SCM system, although we recognize that sustainability is more than integration. The specific attributes which characterize an integrated supply chain have been articulated for public health[2] and adapted here for SC4CCM endline evaluation purposes.

In an integrated supply chain, "people, functions, levels, and entities of the supply chain are linked and managed under an interconnected supply chain organization. Supply chain managers are empowered and understand how to collect and use information to map the system and streamline processes, use resources more effectively, monitor and improve performance, and align various supply chain processes to achieve common goals."

The long-term goal is the development and implementation of an integrated SCM system. SC4CCM did not directly try to achieve this, but the project strove to contribute by including considerations for an integrated supply chain both in the design and implementation process for the innovations. SC4CCM used two cross cutting principles to guide its approach. The first principle was to design the innovation with an eye to maximizing its affordability and feasibility of implementation so that it could be scaled up relatively easily to other districts if the practice proved to be effective. The second principle was to implement the innovation in a way that facilitated its absorption by the existing SCM system by streamlining procedures where possible, aligning with higher levels, and creating strong management practices that allowed for flexibility and agility.

Evaluation Methodology

The SC4CCM endline used a combination of quantitative survey and qualitative methods. For the quantitative evaluation, the objective was to assess the effect of strengthening IPLS for HEWs at direct delivery HCs in improving supply chain performance along the various levels of the supply chain. For the qualitative portion, a case study was conducted on select good performing sites to provide insight into how and why operationalization of IPLS for HEWs was achieved.

Quantitative Methodology

The SC4CCM intervention focused on all direct delivery HCs in two regions, SNNP and Amhara. Therefore, the quantitative evaluation (baseline and endline) was based on a census of direct delivery sites in these two regions.

The main outcome indicators that were assessed during the quantitative evaluation were:

- HEWs have usable and quality medicines available when needed for appropriate treatment of common childhood diseases. The medicines assessed include cotrimoxazole, artemisinin-based combination therapy (ACTs), oral rehydration salts (ORS), zinc, and ready-to-use therapeutic foods (RUTF).

[2] John Snow, Inc. Getting Products to People: The JSI Framework for Integrated Supply Chain Management in Public Health, 2012.

- Necessary, usable, quality iCCM products are available at HEW resupply point(s)
- HEWs or persons responsible for HEW resupply know how, where, what, when, and how much of each product to resupply
- HEWs have adequate storage: correct conditions, security, and adequate space

Local Evaluation Partner

To improve efficiency and build local ownership and capacity, SC4CCM selected JaRco through a competitive process as an evaluation partner in Ethiopia to oversee all aspects of quantitative endline data collection. JaRco also conducted the baseline survey in 2012.

Data Collection Tools

For both the Phase 2 baseline and endline, the Logistics Indicators Assessment Tool (LIAT) was the main tool for gathering quantitative data. The LIAT is a proven tool for assessing stock status and other quantifiable performance metrics of a supply chain.[3] It was modified both to focus on community level supply chain issues and for the Ethiopian context. Survey questionnaires were formatted for and loaded on to smart phones for greater ease and efficiency of data collection. The LIAT collected data to measure core indicators through structured interviews with HEWs and with HC and/or warehouse staff at all levels of the system. Data collection included physically counting the quantity of key iCCM products (14 tracer commodities) kept at each level of the system (including stock kept by the HEWs) and observation of storage conditions and certain aspects of record keeping and reporting. Intervention sites are listed in Appendix 3.

Table 2: LIAT sample for Phase 2 (Census of intervention sites)

	Amhara-West Gojam		SNNP-Hadiya	
	BL	EL	BL	EL
Zones	1	1	1	1
WoHo	14	14	9	9
HC	16	16	15	15
Health Posts	79	76	98	100

Case Study Methodology

The primary objective for the case study of the SC4CCM endline was to provide insight into **how** and **why** operationalization at HP level was or was not achieved, to understand if IPLS for HPs had been institutionalized to any extent at the PHCU level, and to understand the potential for scaling and integrating this intervention throughout the health extension program. Because these concepts are not easily measured with a quantitative survey, a case study methodology was used to assess these concepts and the nature of the relationships.

Questions addressed by the qualitative study:

1. To what extent was IPLS for HEWs[4] operationalized?
2. What implementation approaches are necessary and sufficient for achieving operationalization of IPLS for HEWs?

[3] USAID | DELIVER PROJECT, Task Order 1. 2008. *Logistics Indicators Assessment Tool (LIAT).* Arlington, Va.: USAID | DELIVER PROJECT, Task Order http://deliver.jsi.com/dlvr_content/resources/allpubs/guidelines/CondSCAsseLSATLIAT.pdf

[4] IPLS for HEWs refers to both HEWs using IPLS procedures and HC staff using IPLS procedures to resupply HPs

3. How has the operationalization of IPLS for HEWs contributed to product availability at the HP level? If it has, what were the important factors? If it has not, what were the important barriers?
4. What were the enabling, facilitating, and hindering factors for operationalizing IPLS for HEWs?
5. To what extent was IPLS for HEWs institutionalized at PHCU level?
6. Considering that SC4CCM is a pilot learning approach, how can project inputs and lessons be translated for scale-up purposes?

The conceptual framework figure (Appendix 2) also shows, in large arrows, the primary contextual and mediating factors that are likely to have affected both the effectiveness and implementation of the SC4CCM innovations. These factors were used to help identify the selection criteria for the case study units. This case selection approach helped control for these contextual and mediating factors when analyzing the qualitative data, which maximized the relevance and transferability of the findings beyond the selected cases.

The case study component of the endline purposefully selected HCs that were known to be performing very well with the IPLS so that positive lessons on how to achieve optimal operationalization of IPLS for HEWs could be drawn. The SC4CCM team selected high performing HCs based on the latest round of supervision data on performance of supply chain tasks and average product availability across the 14 tracer drugs (Appendix 5). Feedback from the local project implementation team in Ethiopia was used to further revise the selection in both regions. We selected one PHCU from each zone that had the following characteristics:

1. Good Supply Chain Performance / Good HP Product Availability
2. Good Supply Chain Performance / Low HP Product Availability

We selected HPs based on distance from the selected HC, assuming that the support received for IPLS and transport barriers varied by how "accessible" the HP is to the HC. For each HC, we chose one HP that is close to the HC and one that is farther away and considered harder to reach. We applied these case selection criteria to include two HCs per zone and two HPs reporting to each HC, for a total of four HCs and eight HPs (appendix 4).

We collected data from these HCs and HPs, as well as the WoHO, ZHD, and RHB associated with those four HCs, the PFSA hubs, FMOH, PFSA Central, and key iCCM partners at the central level (Table 3).

Table 3: Data collection activities, SC4CCM endline case study

Levels	In-depth Interviews	Other data collection activities	Photos
Central – FMOH, PFSA central partner	3	-	-
Partner	1		
Region	2	-	4
PFSA Hub	2	-	-
Zone	3	-	-
Woreda	4	1	6
Health center	8	20	12
Health post	8	23	37
Total	31	44	59

At the HP level, we interviewed both HEWs wherever possible. At HCs, we interviewed two key staff (PHCU Director and Store Manager). Depending on the role that each level played in IPLS, we used other

data collection techniques as well (see Appendix 6) for a complete list of data collection exercises used as each level.

Analysis of Endline Data

Case study and survey data were analyzed separately and then triangulated to identify concordance and discordance.

Transcripts from the case study interviews were first analyzed by the entire data collection team, SC4CCM project staff who participated in the process evaluation, as well as SC4CCM headquarter staff and the principal investigator (PI) from George Washington University. Data were first examined by woreda, starting with the HPs and working up to the WoHO and ZHD. PFSA Hub, RHB, and central level interviews were incorporated in the next stage. After an intensive analysis with the entire study team, specific themes and topics were analyzed by different team members, and the findings were documented and archived before being incorporated into the findings statements.

LIAT data was analyzed using Stata SE 13 by SC4CCM headquarter staff. Chi square tests were used to test significance between results between baseline and endline. Findings from the survey informed further focused analysis of the case study data.

When concordance among findings between the two sources of data were found, we used the case study data to try and explain the survey findings and provide more information on the processes and experiences of the IPLS users. We found very few instances of discordance, and the few that we found – specifically around training and product availability – were explained once the case study data were examined more in-depth. We present both sources of data under each major finding.

Given that we conducted a census of direct delivery sites in Amhara and SNNP for the LIAT survey, the results are generalizable to all pilot sites in these two regions. The case study purposefully selected HCs and HPs as case units, focused on selecting a “positive performance” sample. The intent was to learn from the positive end of the performance spectrum in order to understand how case units achieved good performance, which would be relevant for other HCs and HPs. The results from the case study are transferable to other units (HC and HPs) operating in similar contextual situations as the selected case units. Because we used performance on supply chain functions and product availability as case selection criteria for HCs and accessibility to HC for selecting HPs, these criteria can be used to determine how similar other HCs and HPs are to those in the case study; in the absence of HC performance data on IPLS and supply chain reporting, the woreda level context can be used instead to determine comparability of HC contextual situation and transferability of case study results. Overall, our assessment is that the contextual situations of the four HCs and eight HPs in our case study sample are not atypical, and the results should be transferable to the majority of HCs and HPs in these two regions.

Key Findings

Operationalization of IPLS for iCCM for HEWs

Survey results show that the IPLS is now to a large extent operational at HPs in the pilot areas, with some follow up support on correct use of bin cards still required. Operationalization of IPLS is defined as regular and correct use of recording and reporting tools and storage of products as per the IPLS standard operating procedures (SOPs). Successful operationalization of IPLS for iCCM products is supported by the survey data from all HPs and HCs and by findings from the qualitative case study.

The case study found that HEWs were fully capable of performing all their IPLS tasks. We observed **skilled and consistent use of both bin card and HPMRR**, according to the standard operating procedures (SOPs), among the eight HPs we visited for the qualitative case study. All HEWs could explain how to use the bin card accurately and the bin cards observed were up to date and complete unless there had been a long stockout for that product. For HPMRR, all but one HEW could explain how to use it accurately (for one HEW, the form was not available). Only one HEW had information missing from the top of the form; all others had fully completed HPMRR for the most recent month. The HEWs we spoke to reported not having problems with using these IPLS tools, and none complained about the tools being too much work.

"Would you recommend the bin card and HPMRR to other HEWs that don't use it yet?" "Yes, we would. We would tell other HEWs that it would make their work easier and that we too used to dislike it before we understood it. However, it is good because it makes our work easier." ~HP A2.2

"Can you compare how it was before IPLS and after you received the training?" "Yes. Before, we had no idea how much medicine we had left until we had a stockout. But now, we request products monthly so it's better. Also, we weren't monitoring expiration dates before, but now we can." ~HP B1.1

"What things are easier because you are using bin cards?" "I am able to know which medicines are about to finish. It is also easier for me to request medicines once a month from the HP. I don't have to argue with HC staff about it because I have proof of how I used my medicine and what I am in need of." ~ HP B2.1

These case study findings are supported by the survey data collected through the LIAT (Table 4). Across all 176 HPs, the indicators for different aspects of IPLS performance strongly support that HEWs are using the IPLS properly and consistently, and that this performance has improved, significantly in many cases, between baseline and endline measurements (approximately a one year interval). Availability of tools at HP level improved dramatically over one year and reached comparable levels in both Amhara and SNNP. Reporting frequency and regularity for HPMRR improved more in SNNP than Amhara, mostly because Amhara had higher performance on most of these indicators at baseline. For most measures, the survey results show that IPLS performance levels for some indicators have reached high enough levels that further improvement is unlikely.

Table 4: Summary of findings among health posts for IPLS performance indicators for Phase 2 baseline (2012) and endline (2014) evaluations in the intervention sites (West Gojam, Amhara and Hadiya, SNNP)

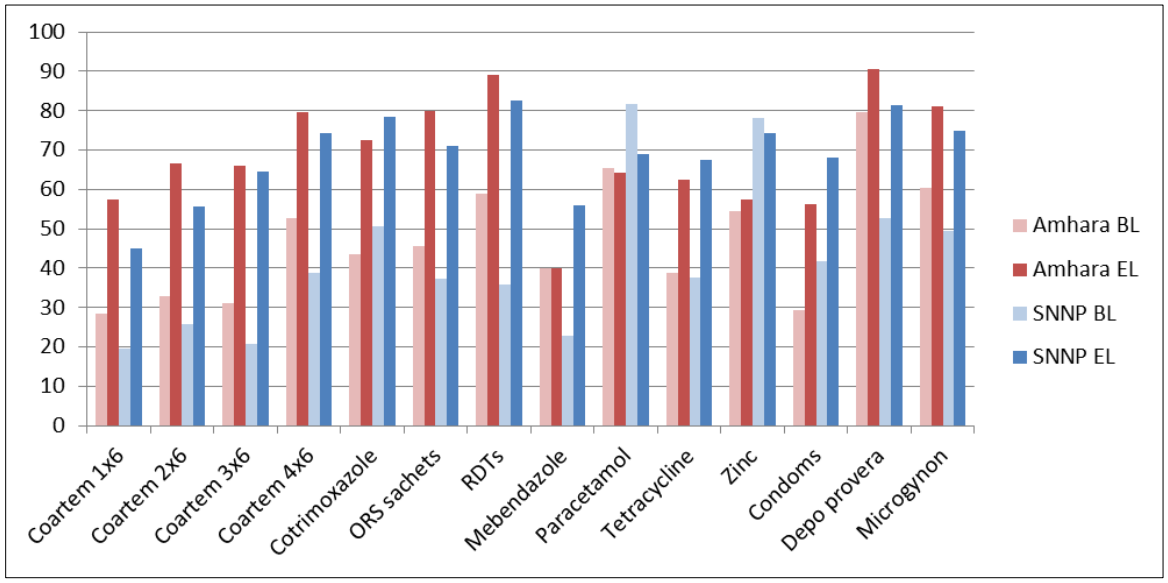
	Amhara – West Gojam						SNNP - Hadiya					
% of HEWs	**N**	**Total**	**BL**	**N**	**Total**	**EL**	**N**	**Total**	**BL**	**N**	**Total**	**EL**
Availability of Tools												
Flipbook (yes, seen)	47	75	63%	66	75	88%*	42	90	47%	79	90	88%*
Blank bin card (yes, seen)	71	74	95%	64	68	94%	84	91	92%	69	87	79%*
Blank HPMRR (yes, seen)	55	75	73%	63	75	84%	50	90	56%	79	90	88%
Bin Cards												
Bin card for every product they managed	3	71	4%	20	73	27%*	7	92	8%	33	92	36%*
Average number of products for which each HEW had a bin card	11			12			9			10		
Bin cards stored correctly	31	62	50%	43	69	62%	44	74	59.5%	72	88	82%*
Bin cards observed had a discrepancy greater than 50% between physical count and balance recorded	159	352	45%	171	588	29%*	171	588	29.1%	147	617	24%
HPMRR												
Submit HPMRR forms monthly	68	75	91%	74	75	99%	46	90	51%	87	90	97%*
Submitted in the last 30 days	44	75	59%	67	75	89%**	25	90	28%	69	90	77%*
Never submitted a report	9	75	12%	0	75	0%	59	90	65.6%	1	90	1%*
All HP columns had been completed (observed)	46	53	87%	60	64	94%	16	41	39.2%	63	78	81%*
Resupplying of HEWs												
% HEWs said they receive products monthly	10	75	13%	74	75	99%*	37	90	41%	80	90	89%*

*p<0.05

** The question had different answer options and the differences in the answer options at EL was found to be significant

However, there is still room for improvement for bin card use – they could be used more consistently across all products, stored more correctly, and have fewer discrepancies between recorded and physical counts – but the direction and magnitude of improvement over the previous year is substantial. The survey data also shows that there is a significant increase in use of bin cards across the board, except for paracetamol and zinc, and t there are significant improvements in number of HEWs who have a bin card for all products managed. However, there is still room for improvement because HPs should have a bin card for every product they manage. The possible reason for fewer bin cards for zinc is that this product has until now been pushed to HPs rather than supplied via the HPMRR, and therefore, HEWs have not regarded this as a product that needs to be tracked using IPLS tools.

Figure 1: Percent of HPs with bin card by product, BL/EL



Results also show that the **IPLS is now operational for processes between HP and HC and for processes at HCs related to maintaining and resupplying HP products** in the pilot sites. In the case study, we found that HC staff were using the IPLS tools for HP products –the bin cards, HPMRR, and RRF – in accordance with the SOP. We observed that relevant HC staff (store managers in particular) had the necessary skills for managing iCCM stocks and resupply to HPs, and the tools were being used correctly. All HC store managers could explain the bin card accurately, and all bin cards observed were up to date and complete. All four HCs could explain how to complete the RRF and HPMRR correctly; only one HPMRR observed had some minor errors in the top section, such as switching the HP and HC names.

The case study findings are supported by the survey data collected through the LIAT (Table 5). Across all 31 HCs, the indicators for different aspects of IPLS performance strongly support that HC staff are now maintaining stocks of key iCCM products and using the IPLS properly and consistently. Availability of tools was high at baseline, and in most situations, this was maintained at endline. However, the availability of bin cards for SNNP slightly decreased. More HCs are now stocking key iCCM products compared to baseline, when many HCs were not aware they should be managing cotrimoxazole and zinc and therefore were not ordering or stocking these products.

Use of IPLS tools was high at baseline for the HCs and as a result did not improve much more at endline. Use of RRF was good at baseline and did not improve significantly at endline; however, at endline 100 percent of HCs in both regions reported that they include the needs of HPs when submitting the RRF.

Completion of the HC portion of the HPMRR was very good in Amhara at baseline and did not improve at endline; however, there was some improvement seen in SNNP with 100 percent of HPMRRs observed having been completed.

Table 5: Summary of findings among health centers for IPLS performance indicators for Phase 2 baseline (2012) and endline (2014) evaluations in the intervention sites (West Gojam, Amhara and Hadiya, SNNP)

% of HCs	Amhara						SNNP					
Availability of Tools	**N**	**Total**	**BL**	**N**	**Total**	**EL**	**N**	**Total**	**BL**	**N**	**Total**	**EL**
Blank bin card (yes, seen)	14	16	88%	13	15	87%	14	15	93%	12	15	80.%
Blank HPMRR (yes, seen)	14	16	88%	14	16	87%	12	15	80%	14	15	93%
Management of iCCM products												
Managing co-trimoxazole 120mg	4	16	25%	16	16	100%	6	15	40%	15	15	100%
Managing zinc 20mg	12	16	75%	15	16	94%	2	15	20%	15	15	100%
RRF												
Supposed to regularly complete and submit a logistics report	15	16	94%	16	16	100.%	13	14	93%	14	15	93%
Report bimonthly	11	16	69%	15	16	94%	13	15	87%	15	15	100%
Include the needs of the HPs when submitting the RRF	16	16	100%	16	16	100%	12	15	80%	15	15	100%
HPMRR												
All HC columns had been completed (observed)	14	15	93%	15	16	94%	7	9	78%	15	15	100%

Benefits of IPLS tools realized by HEWs and HC staff

The case study data show that **HEWs recognized benefits of using the IPLS tools** after a period of practice. They felt more in control of their supplies. Because they are able to monitor stocks, they felt better able to avoid stockouts and over supply, both of which they considered to be problems before. They appreciated that resupply is now part of their regular work routine. In particular, they appreciate that they have to **visit the HC fewer times per month**, and in a more predictable rhythm, in order to maintain the iCCM product supplies they need for managing child illnesses in their community.

Table 6: Benefits realized from IPLS for health extension workers

Benefit:	Key Quotation:
Sense of Order/ Organization	"*We can now record all the information on work we do weekly. Prior to the HPMRR, we used to write all the information everywhere on different pieces of papers and so it would take us longer to complete our monthly reports. However, that is no longer a problem." HP A2.2*
	"Now, we know what we have in stock because the bin card helps us keep track. Also now, the HC uses the HPMRR and gives us what we need. ***Before, we'd go to the HC, get one drug and forget to ask for another. We'd have to go back the next day.*** *Thanks to the bin card, we're also able to use first the drugs with the closest expiration dates. We separate the expired drugs from the rest now. When we have an overstock, we report it and give it to another HP or to the HC."* ~HP B2.2"
Transparency Between HC and HP levels	"*I am able to know which medicines are about to finish. It is also easier for me to request medicines once a month from the HP. I don't have to argue with HC staff about it because I have proof of how I used my medicine and what I am in need of." HP B2.1*
	"*We know when we are low on stock, and the HC knows it too, by looking at the HPMRR. We submit our report every 30 days and the HC gives us the medicines we need. Before, we didn't receive any medicine unless we asked for some."* ~HP A2.1"
Time and Effort Saved During Resupply	*"Before, we had to go to the HC often, almost weekly, to get different medicines that finished each time. Now it saves us energy because we get medicines that we ask for. We ask for it one time when we submit our reports. The HC would always tell us to get our medicines every three months before IPLS because they were frustrated with us always going to them, but now all of this is much better." HPB1.2"*
	"*I haven't experienced any [challenges]. Before we used the HPMRR, we used to hate the bin card because we did not understand it, but now we know it and love it. We used to feel that our work was going to be more because of it, but it has made our work easier."* ~HP A2.2
	"*I can now ask for medicines easily, I can complete reports easily, store medicines much better. I can also record the name of patients; I wasn't able to do so easily last time because I would be too busy."* ~HP A1.1
Avoids Stockouts	*"<u>What things do you think could be improved upon in relation to bin cards/HPMRR?</u>""Everything is good. We receive the medicines we need. Before, we used to have to sit here at the HP without some medicines, without paracetamol, without ORS. Now, we have all the drugs we need at our HP. We're able to better serve our community. It's very good." ~HP A2.1*
	"Before, we had no idea how much medicine we had left until we had a stockout. But now, we request products monthly so it's better. Also, we weren't monitoring expiration dates before, but now we can." ~HP B1.1

The **HC staff, including the PHCU Director, also recognized the benefits of using the IPLS**, both for the HEWs and for themselves. Proper and consistent use of IPLS has increased transparency around iCCM product resupply, which has improved HC staff's understanding of HEW and HP supply issues and improved confidence in HEW reporting on needs for iCCM products. There is a clearer feeling of accountability for iCCM products, which enables HC staff to better monitor product supply and engage with iCCM at the HP level.

Table 7: Benefits realized from IPLS for health centers

Benefit:	Key Quotation:
Confidence in HEW Resupply Requests	*"What things have improved on bin cards and HPMRR since the refresher training?" "Now the HEWs know what medicines have expired and they should know how to report expired medicine, how they should give medicines whose expiration date is near to other HPs to use on time, and how to conduct physical counts. Before the training they used to estimate medicines they needed, but now they know how to conduct physical counts so there are no gaps." ~HC A1:store manager* *"Now they can separate the medicines that have expired on their own without assistance from the HC. Before the training, they did not do this and there were a lot of mix ups between medicine that had expired and those that didn't expire. HEWs are now also able to use the medicines that they need earlier through FEFO[first expired, first out]." ~HC B1: PHCU director*
Regularity in the Resupply Process	*"Oh, there's a huge difference. Before, they knew nothing about products. A lot of products expired. They didn't know what products they were stocked out on. They acquired all their products as emergency. They'd just come and say, 'I have no more of this; give it to me now.' But now, they're know what products they're low on, what they need to have resupplied. They bring their reports once a month and we resupply them. Before, they wouldn't know until they got stocked out." ~ HC A2*
Accountability and Transparency in HP	*"I can know what items are at the HP and the services that are being provided. I can see this now whereas before HEWs would come frequently to the HC and ask for medicines. I wouldn't know if they had some at the HP or not, unless I went to the HP myself and counted the medicine. It is also easier for me to ask for more medicines from higher levels based on the reports that HEWs submit to me" ~ HC B2* *"Now, the HC staff and the HEWs know that the HP requests medicine based on consumption, through their reports. So, when the HEWs don't receive what they've requested, they ask questions. I'll go to Woreda and ask for the products, or else the HC will try to buy it through healthcare financing. We understand the problems so we're better able to solve them." ~HC A1: store manager*

Inputs needed to operationalize IPLS for HEWs and between HP and HC levels

Successful operationalization of the IPLS for HEWs required a variety of inputs: training, follow-up and continued support, and leadership. The data showed that these critical components and functions came together to operationalize IPLS for HEWs**.** The program impact theory in appendix 7 depicts the elements identified in the data and the relationships among them.

A clear finding from the qualitative study is that **IPLS operationalization is achieved quite quickly** after knowledge and skills are fully and properly imparted. We found that "fully imparted" means that each of the tools and their use are explained until HEWs have complete and consistent understanding. "Properly" means that training was conducted in a participatory way that included practical learning of the IPLS tools. This operationalization was achieved approximately three to five months after the refresher training on IPLS and 12 to 18 months after the initial training was done.

We examined the case study data to determine how and why inputs influenced operationalization of IPLS for iCCM products at the HP level and between the HP and HC in order to identify lessons, enabling factors, and risks for scale-up.

IPLS for HEWs Training

The survey data show that fewer HC staff had received formal training in IPLS or training of trainers (TOT) on IPLS for HEWs at endline, compared to baseline (Table 6), most likely due to high staff turnover. Despite this reduction in formally trained HC staff, more HEWs managed by these HCs reported that they had been trained in IPLS at endline.

Table 8: Training in IPLS for HC staff and HEWs in the intervention sites (West Gojam, Amhara and Hadiya, SNNP)

	Amhara						SNNP					
	N	Total	BL	N	Total	EL	N	Total	BL	N	Total	EL
% HCs formally trained on IPLS	15	16	94%	12	16	75%	15	15	100%	11	15	73%
% HCs received TOT on IPLS	11	16	69%	8	16	50%	14	15	93%	6	15	40%
% HEWs trained in IPLS	74	75	95%	76	76	100%	51	98	52%	78	97	80%

Most HEWs in the LIAT survey reported having been trained in IPLS (Table 6), most likely because refresher training had been conducted recently before the time of endline data collection. HEWs in our case study reported two types of training:

- Initial training session for HEWs in IPLS at the HC either as a dedicated session or as part of a PHCU meeting, usually conducted by the Store Manager and PHCU Director, as per project design (done in 2012)
- Refresher training co-facilitated by SC4CCM staff with HC staff, in response to project monitoring that HEWs were still having trouble using bin cards in particular (done late 2013)

A major risk to scale-up of IPLS for HEWs is the high staff turnover at HC level, and the case study data provide lessons for how to minimize that risk. The case study found evidence on how **HCs found ways to maintain IPLS skills and knowledge in the face of staff turnover**:

1. PHCU Directors and Store Managers included IPLS for HEWs in replacement training
2. They ensured that more than one person at the HC was trained in IPLS and IPLS for HEWs
3. They used the PHCU meeting as venue for training in IPLS
4. They used OJT to make sure that IPLS use was sustained even with staff turnover.

"How do you train new staff on IPLS?" "There was a new pharmacist from another area that joined our HC. We showed this pharmacist everything from filling reports to ordering medicine, but if she is out sick or on maternal leave, other HC staff should have OJT on every little thing. Because of this she is doing her job well."

"Can you tell me more about OJT? How long is it for?" "For the pharmacist we recently trained, we used the former pharmacist to show her around. Then we looked at how she filled reports and we then followed up with her for a week to see how she was doing her work after we had trained her. Then we had her work with the former pharmacist so she wouldn't be working alone. This is how we provided OJT for her." ~HC A2: PHCU director

Quality of training

The IPLS training for HEWs was designed by the SC4CCM project to be affordable, by using HC staff as trainers of HEWs and the HC as the training venue, rather than bringing HEWs to the woreda or region. However, in the pilot, this cost-efficient approach to **IPLS skills training most often needed to be followed up with refresher training.** There are important lessons to be learned about the importance of the quality of the training from HEWs in the case study who observed the difference between the initial training conducted by HC staff alone and the refresher training that was conducted with the presence of SC4CCM staff and sometimes woreda staff. In one of our case HPs, the HEWs described the first training as an orientation because it was held at the HC and not the woreda or zone. This HEW went on to explain that the refresher training was of better quality and more effective; they described that the refresher training used a participatory and hands-on approach. The HEW also explained that the presence and recognition by staff external to the HC at the refresher training reinforced the message that IPLS was important. Refresher trainings will be discussed more in the next section.

"When we received the initial training, we were very relaxed about the whole thing. We didn't think that we really had to do the work. The training was given at the HC so we thought of it as being more like an orientation, not training. When we have training, it usually takes place at the woreda and zone, and it lasts two days or more."~ HP A1.2

"Has the refresher training with [SC4CCM project staff] added to your knowledge about bin cards?" "Oh yes. When the store manager gave us the initial training, he did it very roughly. The training wasn't participatory. [SC4CCM project staff] went through the material very systematically, had the HEWs read the material turn by turn. It was during the refresher training that I learned that I should be writing down the number when I do physical counts." ~HP A1.2

"We still used the bin cards and HPMRR after the initial training, but we became more serious about it after the refresher training with [SC4CCM project staff]. After the refresher training, we were even recognized by the woreda for our good work." ~HP A1.2

Although HEWs at this one HP (HP A1.2) were the only ones to explain in detail what made IPLS training effective, participatory training approaches and presence of higher level staff, these lessons should be considered for scale-up. In the pilot, SC4CCM and woreda staff presence helped HEWs realize that the IPLS training was important and ensured the use of a participatory, hands-on training approach following the IPLS curriculum; these resulted in effective skills building[5]. We believe both could be achieved during scale up with the presence of woreda staff at the initial trainings in order to ensure quality and emphasize the importance of IPLS to HEWs and HC staff.

It is recognized that a cascade training approach **using the HC staff to train HEWs in IPLS is an affordable and feasible way to scale-up.** Any cascade training will have variation in the quality of the training conducted. The case study data from the pilot clearly show that **for scale-up, one-time training should not be considered to be enough.** The IPLS scale-up approach must include planned follow-up and continued support, including refresher training, to operationalize IPLS successfully at the HP level and between the HP and HC for iCCM products.

Follow-up and continued support to operationalize IPLS

While training gives HEWs the necessary information on the purpose and how to use IPLS tools, follow-up and continued support is necessary to make IPLS operational. The survey data show that almost all HEWs reported ever receiving supervision and problem solving during the PHCU meetings (Table 7). Both the survey and case study data show that PHCU directors are less involved in supervision of HEWs for IPLS at endline than baseline, but that HC store managers are more involved. Problem solving sessions as a form of continuous support to HEWs seems to have become a routine practice in PHCU meetings.

Table 9: Follow-up and continued support for IPLS for HEWs

	Amhara						SNNP					
	N	TOTAL	BL	N	Total	EL	N	Total	BL	N	Total	EL
% HEWs ever receiving supervision	66	79	84%	71	76	93%	94	98	96%	95	97	98%
% of HEWs reporting supervision from PHCU directors	29	66	44%	10	71	14%	38	94	40%	14	95	15%
% HEWs reporting supervision from HC store managers	24	66	37%	26	71	37%	30	94	32%	36	95	38%
% of HEWs reporting supervision from HC clinical nurse	28	66	42%	20	71	28%	30	94	32%	45	95	47%
% HEWs report having a problem-solving session during PHCU meetings	55	79	70%	74	76	99%	68	98	69%	96	97	99%
% of HC Store Managers held IPLS problem solving sessions with HEWs	15	16	94%	13	14	93%	12	15	80%	12	13	92%
% HCs with PHCU meeting minutes	N/A	N/A	N/A	8	13	61%	N/A	N/A	N/A	11	12	92%

[5] The SC4CCM midline evaluation showed that HCs preferred organized group training to OJT.

The case study showed that **some combination of continued follow-up and support is needed regardless of the type or quality of the initial training that HEWs receive on IPLS**, and **the HC as learning site provides opportunities to provide that support during activities**: this offers a feasible, cost-effective approach to providing continued support for making IPLS operational for HEWs.

All of the HPs in our case study reported receiving at least two forms of continuous support, and four reported receiving PHCU and on-site supervision. Six health posts reported support for IPLS received through the PHCU meetings, and five reported on-site supervision (Table 8).

Table 10: Summary table of types of continuous support reported being received, from qualitative case study

	HP A1.1	HP A1.2	HP A2.1	HP A2.2	HP B1.1	HP B1.2	HP B2.1	HP B2.2
OT*	+	+	+	+	+	+	+	+
RT**	+	+	+	+	+	+	+	+
ON***	+	-	+	-	+	+	+	+
OFF****	+	-	-	+	+	-	+	-
PHCU	+	+	-	+	-	+	+	+

*original training **refresher training***onsite supervision****off-site learning and support

The case study identified **four ways that follow-up had been provided to HEWs:** refresher trainings at the HC conducted by PHCU director and store manager, inclusion of supplies in regular problem solving discussions at the PHCU meetings, on-site supportive supervision that includes IPLS and off-site learning, often when HEWs were collecting supplies. Health centers used a variety of these approaches to address gaps and reinforce skills.

> *"… The staff and I started discussing about the problems and challenges we were seeing with regards to IPLS. We started coming up with solutions. The Store Manager and I gave refresher trainings when needed. We also started incorporating IPLS during regular supportive supervision visits."* *HCB 2 PHCU Director*

1) Refresher Training

The majority of HEWs in the case study required the refresher training some months after the initial training by HC staff to address gaps. Our case study shows that the skill level achieved from the first trainings was quite variable, and most of the HEWs we interviewed stated that they learned how to use the bin cards and HPMRR properly during refresher training. This finding is consistent with Phase 1 midline evaluation results where competency for completing a bin card and completing the HPMRR, the two most complex tasks, were the two exercises of the four that yielded the lowest scores. It was suggested that the low scores were due to insufficient time to learn complex tools and the need for repetitive training or OJT on these topics.[6]

[6] SC4CCM Project Team. 2013. *IPLS for HEWs Training Midline Evaluation, October to December 2012*. Arlington, Va.: SC4CCM. http://sc4ccm.jsi.com/files/2013/09/Ethiopia-Midline-Report_FINAL.pdf

"Were you trained on HPMRR?" "Yes. The Store Manager gave us a rough training on it, but I understood it even more during the refresher training with [SC4CCM project staff]. But we started using the HPMRR after our initial training with the store manager." ~HP A1.2

"Can you please compare the initial training you had with the refresher training (given by [SC4CCM project staff])? Is there a difference in your knowledge?" "Yes there is. For instance, during reporting I did not know about doing a physical count of my medicine, but now I do." ~HP A1.1

"And which training was most useful in helping you use the HPMRR?" "Both trainings were useful, but we became clear on how to use the report after the refreshment training with [SC4CCM project staff] (refresher training)." ~ HPB1.1

"What about when you compare your usage of bin cards and HPMRRs before and after the refresher training with [SC4CCM project staff]?" "Yes, we had gaps with the HPMRR at first. Now we're clear on it, after [SC4CCM project staff]'s (refresher) training. We were able to fill in bin cards but we'd get confused when it came time to transfer the information to the HPMRR." ~ HPB1.1

2) Problem-solving for iCCM products during PHCU meetings

The routine inclusion of IPLS problem solving at the PHCU meetings was supported by our case study data. The SC4CCM project was able to tap into the existing problem solving culture that is evolving within the Health Sector Development Program. SC4CCM supported the development and communication of a government mandate to include the issues of supplies in regular PHCU meetings. The data from the case study clearly show that **the PHCU meetings are used as an avenue to discuss supply issues, conduct supply chain training when needed, and to discuss and solve supply chain problems.** PHCU Directors and Store Managers regularly included discussion of supplies as a specific agenda item for PHCU meetings or Command Post meetings. HEWs reported that they felt that they are able to raise their problems with regard to iCCM products and have them solved during the PHCU meetings.

Inclusion of IPLS in PHCU meetings

Areas of focus	Key Quotations
IPLS for HEWs as an agenda item	*"What are the agenda items for these meetings? What things do you discuss?" "We talk about the HC-HP link, especially concerning the 16 packages. We discuss report timeliness and data quality; filling gaps in iCCM product resupply." ~HC B1: Store Manager* *"What topics were discussed during this meeting?" "We always talk about medicine and bin cards. The PHCU director has those as agenda items for each meeting." ~HP A1.2*
Capacity building opportunity	*"During the monthly meetings, do any of them address IPLS?" "The HC head/director talks about the work of the HC staff and HEWs during the meetings. He also talks about how medicines should be stored, how we need to submit reports on time, that we need to fill bin cards daily and that we will receive medicine from the HC depending how we fill out the bin card." ~HP A1.1*

	"At the end of every month, on the 30th, we also have a monthly meeting where we evaluate and discuss about bin cards. Bin cards and HPMRR are the first agenda items during these meetings. If the pharmacist sees a mistake on our reports, we will bring it up at the monthly meetings. He will address all the mistakes and also talk about the things that are being done right." ~HP B2.2
Supply chain problem solving	*"What topics do you raise during these meetings (PHCU)?" "It's a problem solving session for us. We touch on everything…everyone brings up their issues, everyone from the HEWs and the Store Manager to myself. Lately, we've also started discussing specifically about IPLS. The Store Manager will take the lead when we discuss about IPLS, and he'll orient everyone else." ~HC A1: Store Manager* *"Is there IPLS discussion that take place during the meeting?" "Yes there are. We take our own bin cards to the meetings and ask questions or gaps that we have."* *"Are all of your problems solved at these meetings?" "Yes, they try to solve it."* *"Can you give me an example of problem solving that took place?" "When we were confused on what was to be filled in sections A-D of the bin card, how to fill loss and adjustments, they explained it to us. So now we don't have this gap anymore" ~HP B1.2*

3) On-Site Supervision

The survey data show that HEWs report receiving on-site supervision from either their dedicated HC Supervisor (if they had knowledge of IPLS) or the HC Store Manager/Pharmacist or PHCU Director.

"She (HC supervisor) supports us on everything we do here at the HP, including bin cards and HPMRR." ~HP A2.1

"The HC pharmacist came. He looked at our bin cards and HPMRR." ~HP B2.2

"[During supportive supervision] what topics do you cover during OJT?" "I focus on bin cards and HPMRR. Specifically, I look to see if the information on bin cards and the HPMRR match. I also look at storage conditions." ~ HC B2: PHCU director

Our case study data showed that the supervision focused on a variety of areas: HPMRR, bin card, storage, and physical count. It was not clear in the data whether supervisors used the integrated supervision checklist that included IPLS or the IPLS specific checklist.

"What did they look at when supervising on bin cards and HPMRR?" "They checked whether the medicine count at the HP was accurate and if the bin cards and HPMRR were filled correctly. They also checked on the organization of the bin cards and FEFO." ~HP B1.2

"What did he (supervisor) discuss with you?" "He showed us how to organize our products and checked to see if the balances on our bin cards matched the physical counts." "Anything else?" "He told us that when we fill the HPMRR, we shouldn't write the number of individual tablets. We should be writing down the number of strips instead." ~HP B1.1

"You said that she (supervisor) provides you with support specific to bin cards and HPMRR. Can you elaborate more on this?" "Every Monday, we take out medicine for the week from the store room and record it on our bin card. If we make any mistakes while doing this, she shows us how to do it the right way. Before we used to have to write on the bin cards every day but she showed us how to take out medicine for a whole week. She also helps us when we do the physical counts." ~HP A2.1

"Do you use any forms while you're conducting supportive supervision?" "I have a ***checklist, and it has questions on IPLS****. I also give this checklist to other staff when they go to the HPs for supportive supervision". ~HC B1: Store Manager*

4) Off-site Learning and Support

HEWs reported **positive benefits from receiving support** from the store managers when they went to HCs for resupply. Many HEWs also reported additional support and benefits from being able to reach the store managers via mobile phone in between visits. Store managers usually reviewed the HPMRR for completion and correctness and followed up on supply issues.

"As for the HPs, when the HEWs bring their HPMRRs every month, I look to see if there are any gaps and discuss with them…." ~ HC B1: Store Manager

"We see each other regularly because the HEWs come to the HC at the end of every month to submit HPMRRs. I fill in my section of the HPMRR after they bring me their copies. I talk to them about any gaps on their reports, and then they take their supplies and go back to the HPs." ~HC B1: Store Manager

"If you need help or have questions on IPLS, what do you do? Who do you go to?" "We can go to the HC or call them. The HC is not far from here so it's not a problem for us to just walk over there." ~HP B1.1

"If you have any issues that come up between monthly meetings, how do you address it?" "The store manager will help us. He looks at reports when doing so." ~HP A1.1

"If you experience any shortages with supplies at this HP what do you do?" "I go to the HC and talk to the pharmacist or the HC head" ~HP B2.1

Leadership to operationalize IPLS for HEWs

Leadership was found to be necessary for the routine and consistent use of IPLS at the HP and at the HC for HP products. Among our cases, the PHCU Director was a critically important leader for ensuring that HC staff valued IPLS for HEWs. Both the **PHCU Director and the Store Manager were an important repository for IPLS skills and knowledge** that ensured that HEWs could be supported for correct and routine use of IPLS. These two staff needed to work together to ensure that IPLS knowledge

and skills were maintained even with high staff turnover at the HC and to provide continuous support to HEWs through supervision, off-site learning, and problem solving.

"Change can only happen if we are all working together. So there needs to be commitment by all staff. They need to know about IPLS products, what medicines need to be ordered first, about FEFO. So by having all staff know IPLS, this will be good and result in ownership of IPLS by everyone." ~HC A2: PHCU Director

The PHCU Director and Store Manager were also critical for ensuring that HEWs value IPLS and solving issues related to IPLS:

"It was hard to train them [HEWs] at first because they were expecting to get paid. But we made them believe that it was all in their best interest, that the gaps in IPLS were hurting them." ~HC A2: Store Manager

"...if we have an urgent problem that needs to be solved then we go to the HC ourselves and ask. We don't wait always wait for the meetings to problem solve. " ~HP B1.2

Our case study identified that support to the HC is an important part of operationalizing IPLS for HEWs. As such, the **WoHO, ZHD, and PFSA in turn played an important role** in keeping HCs focused on IPLS follow-up by providing supportive supervision.

"Every 2 months, I submit the RRF to both the WoHO and PFSA. We meet during reports. If I have problems at any time, a person from the WoHO (Logistic Manager) is willing to help me and is a very good person" ~HC B2: Store Manager

"Do you receive supportive supervision from the WoHO and ZHD?" "From the WoHO we receive supervision quarterly. The Logistic Officer from the WoHO is always on our side and he comes here frequently to help us with any problems that we have. The PFSA and RHB have come here together as a team twice this year to look at how IPLS was working as a whole." ~ HC B2: Store Manager

"We submit our tracking tool to both the woreda and PFSA, and they participate in solving the problem when it's something that concerns them. The woreda provides supportive supervision. In addition, we submit the HPMRR and the RRF to the woreda. PFSA helps us when we have issues with the RRF. They are trying to automate the system. PFSA and partners come in teams to talk about essential drug quantification for 2007." ~HC B2: PHCU director

"Can you tell me about supervision you receive from WoHO or the ZHD?" "We have a supervisor from the WoHO that comes here (HC). Also, every quarter the WoHO comes to provide supportive supervision and to give us more directions on the work that we need to do. They also go to every HP and HC and use a checklist to fill gaps. They also tell us the gaps HPs have so we can fill these gaps. The ZHD also comes to fill gaps on reports and supplies. A ZHD supervisor comes here to update us on issues the community is facing and to provide supervision for us." ~ HC A2: PHCU Director

"If it's a problem with data quality or information, we can address it as the HC. Or, if it's a small problem with product availability, we will try to address here. If it's beyond our capabilities as a HC, we forward the problem to the woreda." ~HC A1: PHCU Director

Woreda and zonal staff described that they provide regular supportive supervision that includes IPLS.

"How do you plan the supervision the WoHo provides to the other levels?" "We have a checklist that we use; this checklist is integrated and includes other things besides IPLS. The WoHO takes this checklist when providing supportive supervision to the HC. This is done to make sure that all the HCs have enough medicines available. We fill this checklist every quarter. We look at bin cards and medicines during supervision. Supervision is also provided routinely through the PHCU meetings. We also look at TB and other medicine shortages during supervision and we try to solve it for the HCs. There is a big problem with immunization medicine shortages" ~WoHO B1

"What IPLS-specific things do you look at when you provide supportive supervision?" "At the HC, we look at bin cards, make sure that they have a separate one for every product. We take a random sample—say, three, four, or five—then crosscheck the information on bin cards and HPMRR. We look at the ending balance on the bin cards and reports. We also check to see if they've submitted the RRF every two months. At the HP, we also look at the HPMRR and bin cards; we check a random sample. We look at storage and ask some competency questions to the HEWs as well." ~ZHD A

Among our cases, one WoHO's practices provide **a potential model of woreda-level leadership for IPLS** as they show a variety of support activities that can be provided:

Example of model woreda leadership for IPLS

"I interact with the all of them (HP and HC staff) indirectly every month. The HEWs submit their HPMRRs to the HCs, who in turn forward a copy of these forms to me. It's indirect in that I don't see and discuss with the HEWs and HC staff in person, but it's regular because I get the HPMRRs every month. In addition to the HPMRRs, they also submit the RRF bi-monthly. Also, woreda staff—either myself or someone else from woreda—attend some of the monthly PHCU meetings. The first 30 minutes of these meetings focus on supply chain/IPLS. HEWs and HC staff members talk about all the problems that exist; they try to come up with a solution for each; and they name a responsible party who's in charge of seeing this through. Also, we perform supportive supervision quarterly with the woreda program officers and look at all activities including IPLS. We're also trying to have IPLS-specific supportive supervision to the HP level with partners like the SC4CCM. We provide OJT to HC staff. It's hard for us to go to the HPs, but the HC and the HPs are linked so we focus on reaching HC staff, and they will in turn go to the HPs. We ask for the HC to send us feedback after they do supportive supervision. They write us about the strengths and weaknesses, and we combine all the findings into a document with best practices and disseminate it to all the HCs so that they can learn from each other. We have organized all the different documents from the last few years into separate folders as you can see here. [He points to a shelf with folders and starts reading their titles]." ~ WoHO B2

"So, where do you go to provide supportive supervision?"

*"According to the structure established, the HCs and HPs are linked. We provide supportive supervision to the HC, then they take the checklist and go down to the HPs. But, if the PHCU Director tells us to go visit a HP, we do it. We might not go to all 33 HPs, but we go to some. SC4CCM also goes to visit HPs so we go with them. It'd be better if we were able to support all the way down to the HPs, but the structure allows us to only go to the HCs. We don't want to do the HCs to sit idly because we're doing their work." ~*WoHO B2

All of these inputs – IPLS focused training at HC, follow-up and continued support by HC, and leadership – are necessary for building the skills and knowledge for correct use of the IPLS by HEWs, but a chain of leadership for IPLS at multiple levels above the HP is the primary enabling factor for operationalizing IPLS for HEWs.

Product Availability

When considering the core indicator of whether all four iCCM products (ORS, zinc, cotrimoxazole, ACT 1x6 and/or ACT 2x6) were in stock on day visit at the HP, the survey data showed that there was an increase in availability in SNNP; however, in Amhara, iCCM product availability declined. When considering the iCCM products individually we found that **overall product availability in HPs improved or stayed the same, except for zinc** (Tables 9 & 10). In Amhara, the reduction in availability of zinc was significant ($p < 0.05$) and was likely to be the driver for reduction in all four products in stock. In SNNP, the reduction in zinc availability was insignificant.

Table 11: Product availability at HP, baseline and endline, West Gojam, Amhara and Hadiya, SNNP

% of HPs in stock on day of visit	Amhara		SNNP	
	BL	EL	BL	EL
All iCCM products (Cotri, ORS, Zinc, and any ACT)	77%	61%	58%	71%
Cotrimoxazole 120mg tablets	99%	93%	82%	98%*
Zinc 20mg	98%	68%*	95%	81%
ORS	86%	93%	70%	82%
Coartem 1x6 (ACT)	35%	58%*	18%	46%*
Coartem 2x6 (ACT)	50%	72%*	21%	50%*
Coartem 3x6 (ACT)	28%	69%*	13%	61%*
Coartem 4x6 (ACT)	73%	90 %*	54%	71%

* $P < 0.05$

At the HC level, for the core indicator of all four iCCM products (ORS, zinc, cotri, ACT 1x6 and/or ACT 2x6) in stock on day visit, there was an increase in both regions and a significant increase in Amhara. Overall, for individual products, there was generally either an increase in availability or availability stayed almost the same.

Table 12: Product availability at HC, baseline and endline, West Gojam, Amhara and Hadiya, SNNP

% of HPs in stock on day of visit	Amhara		SNNP	
	BL	EL	BL	EL
All iCCM products (Cotri, ORS, Zinc, and any ACT)	25.%	86.7%*	60%	85.7%
Cotrimoxazole 120mg tablets	50.%	93.8%*	0%	93%*
Zinc 20mg tablets	72.7%	93.3%	0%	86.7%*
ORS sachets	87.5%	100.%	93.3%	93.3%
Coartem 1x6	50.%	71.4%	20.%	50.%

Coartem 2x6	62.5%	78.6%	25.%	18.2%
Coartem 3x6	13.3%	64.3%*	9.1%	58.3%*
Coartem 4x6	81.3%	100.%	53.9%	76.9%

*p<0.05

When considering stock status of these products, we can get more insight into the adequacy of supply of products being stocked at the HP by estimating how long the quantity in stock will last. Stock status can only be calculated for those HPs that have bin cards for that product. An HP is considered adequately stocked when it has stock between one quarter of a month and two months of stock; an HP is understocked when it has stock for less than one quarter of a month, and an HP is overstocked when it has stock for more than two months. When comparing stock status at HPs between endline and baseline, there were fewer "no stocks" but little reduction in overstocks in both Amhara and SNNP; in SNNP, there was also a slight improvement in adequate stocks of some products. In both regions, overstocking was still a problem at HCs, although "no stocks" was minimal. In SNNP specifically, there was some understocking of ACTs at HCs.

Figure 2: West Gojam, Amhara stock status

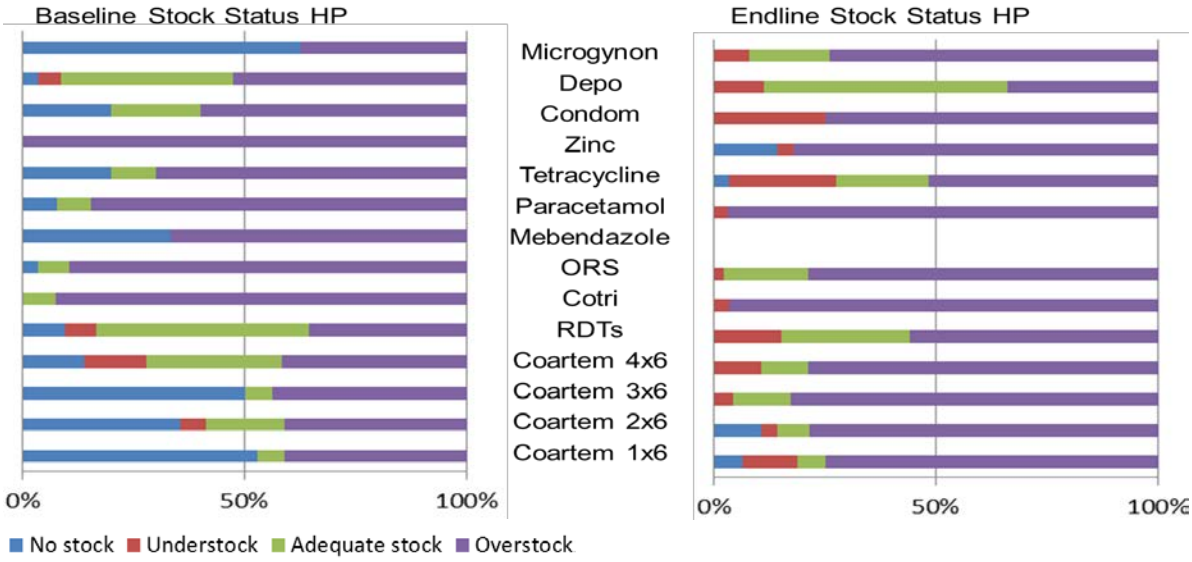
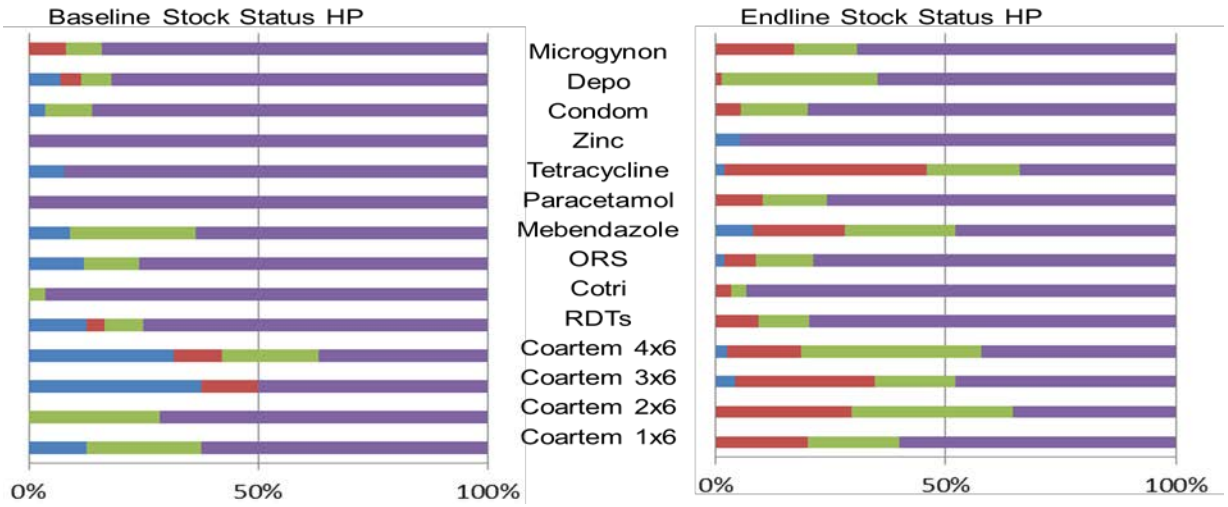


Figure 3: Hadiya, SNNP stock status



While improvement in iCCM product availability at HP and HC levels was limited to only some products, the use of HPMRR by HC for resupply was evident in both regions. Completeness of the HC portion of the HPMRR was found to be near perfect (Table 5), a notable improvement from baseline. Especially in SNNP, and in both Amhara and SNNP, the survey data showed that more HP orders are adequately filled and few are under filled by the HC at endline (Figures 5 & 6). Adequately filled is defined as the amount issued is +/- 20% of the amount requested, under filled is defined as when the amount issued is less than 80% of the amount requested, and over filled is when the amount issued is 120% or more than the amount requested.

Figure 4: Order fill rate: West Gojam, Amhara

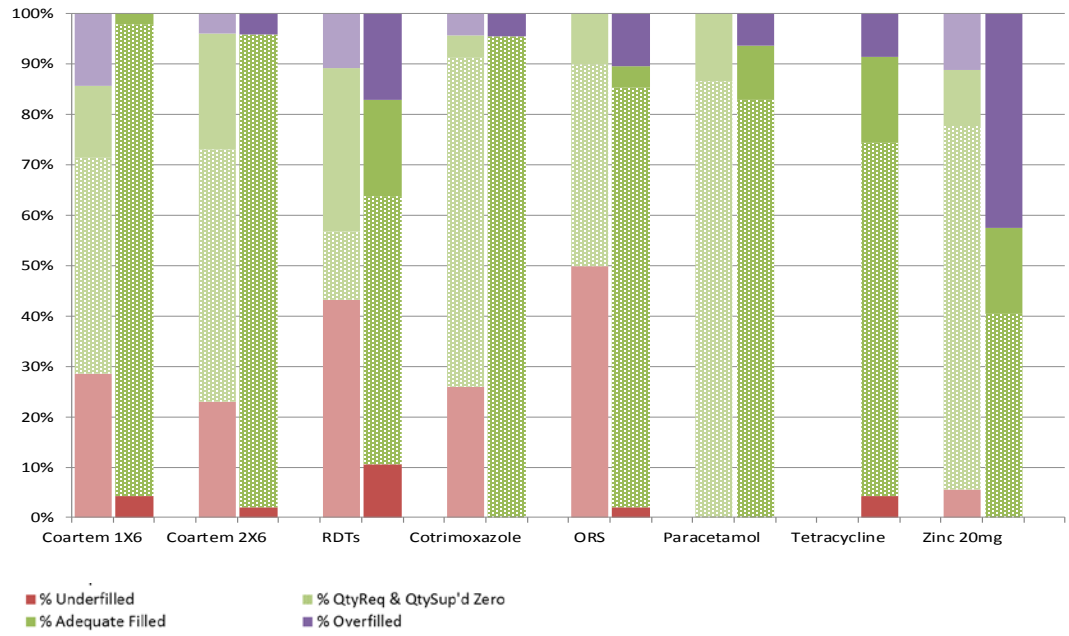
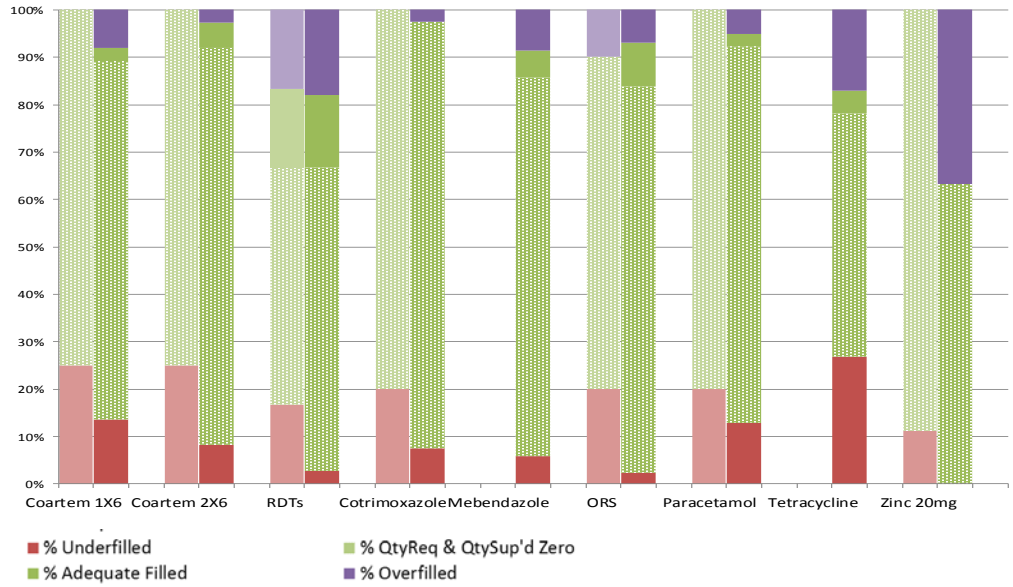


Figure 5: Order fill rate: Hadiya, SNNP



Despite the survey results showing some stock imbalances at HP and HC, findings from the case study showed that **HEWs and HC staff believed, or perceived, a positive effect on the availability of products** after introduction of the IPLS tools.

"Have you seen any difference in product availability since the start of IPLS?" "Yes. Before, we went to the HC to request products only after we had a stockout. And sometimes, we'd have to come back empty-handed if they didn't have anything to give us. ***We wouldn't have any products for service provision. Now, there are no such gaps.*** *"* ~HP B1.1

"Have you seen a difference in product availability since you've started using bin cards and HPMRR?" "Yes. Now I can ask for medicine before I have a stockout. ***I've made the bin card my good friend.*** *It tells me how much I need."* HP A1.2

"Have you seen a difference in the actual availability of products in your HP since you've started using bin cards and HPMRR?" "Yes. Before bin cards and HPMRRs, I used to just write my request on a sheet of paper and give it to the HC. That's how I requested my products. But now, the HPMRR itself tells me how much I need and the HC supplies accordingly. ***I don't get too much product so it doesn't expire in my hands. I get just the right amount.*** *Before, I would get too much medicine and it would expire."* ~HP A1.2

"Has there been any change in product availability since you started using IPLS?" "Before IPLS, the HC would just give us all types and amount of medicine, ***but now with the reports they give us the proper amount of medicine.*** *At first the WoHO used to give medicine to us, but now it is the HC. We used to only have ORS and Coartem given to us initially, but now we get more medicine."* ~HP A2.2

"How has training helped your usage of the HPMRR?" Before, we would write our request on a sheet of paper when we had stockouts. Now, we ask monthly. ***Also, we get the adequate amount now.*** *Before we used to have overstocks because we'd get a lot of products at once."* ~ HP B1.1

The reduction in availability of zinc at HP and the increase in availability of zinc at HC level seen in the survey for Amhara could be explained by findings in the qualitative case study. Two years prior to this study, zinc was funded by a project that was closing and procured en masse (instead of in annual batches) due to funding restrictions from the donor source. The zinc was pushed out to HPs not based on consumption but in excess and had expired in late 2013. A new batch of zinc had been received in country in 2014; this batch appears to have reached the HCs by the time of the survey but had not reached all HPs. The pushing of products has not however been limited to zinc and has also been seen with products such as ORS and cotrimoxazole.

"Zinc quantification was done for 3 years, 2012-2015, planned for staggered system – but it all came at once." ~MOH

"There are products that are sent out on a push system, and not using RRF." ~PFSA B

In response to a question on why a HP had not been supplied ORS in January and February*: "the HP had an overstock as the woreda had supplied them directly." ~HC A2*

"We had too much zinc, and it all expired in December..." ~RHB A

"But they didn't bring these products according to the RRF. They just brought the products here and gave it to us." ~ WoHO A1

Another factor adding to the overstocking and expiry of zinc was the insufficient demand for zinc due to lack of understanding among HEWs about when and how to use zinc for sick child management. As explained by one FMOH representative, "*It seems that there was a **lack of awareness**, even among health professionals, about zinc for diarrheal disease. We sent distribution list to PFSA, State Minister sent a letter, even on how to use zinc."*

Additionally, we found that **the majority of iCCM product supply problems that persisted were related to levels above the HC**. If the HC had supplies on hand, then stockouts at the HP level were easily resolved. This also was true if the HC had to get supplies from the woreda. However, if the PFSA hubs did not have supplies, this was typically due to supply planning and distribution problems from the central level.

*"We send reports to the **WoHO,** but they might not sometimes bring the proper amount....This is because there are times where **PFSA** sends medicines to the WoHO, and maybe they don't have enough to distribute"* ~ HC A1: Store Manager

"Sometimes the HC won't receive the drugs it requested. There are delays in report collection and product delivery. It may take PFSA longer than two months to supply the products." ~WoHO A1

"If the HC doesn't have medicine that we need we have experienced difficulties with shortages of medicine such as zinc and cotri. We have asked for it many times, but we just received some recently." ~HP A1.2

Some PHCU Directors indicated that they solved supply shortages by using health care financing and procuring products such as gloves or lignocaine through local sources; however, store managers stated they could not provide HPs with products procured using health care financing, suggesting some disconnect in the understanding of the policies surrounding these issues.

"What do you mean exactly by healthcare financing? How does it relate to product availability?" "On certain occasions, if the HEWs run out of something that is essential and that they use very often, the HC tries to buy and provide it to them. Like gas or gloves, for example." HC A1: PHCU Director

"There is no clear information about how to solve product availability problems. This came up even at the review meeting. The HC acquires products with its own budget, so it doesn't give those to the HP. It only distributes the program drugs to them. We asked for RHB to give us a clear directive on this, but we haven't gotten anything yet." ~HC B1: Store Manager

This data suggested that **having a mostly functional system at HP and HC levels cannot fully compensate for supply imbalances and insufficient attention to IPLS procedures for iCCM products at higher levels.** Regional and central level supply chain processes currently follow more of a push than pull system for iCCM products, which results in a mixed distribution approach, some of which is not based on consumption. Therefore, most of the continued product availability challenges (imbalances, stockouts) are due to these higher level SCM practices.

While product availability is widely considered to be the best indicator of supply chain performance, in this situation, as the intervention only focused on the lower levels of the supply chain and had little influence on the higher levels of the chain, iCCM **product availability is not the best indicator for measuring operational success based on the intervention**. The contradicting findings from the survey and the case study make sense because of how the supply chain system above the HC level currently functions for iCCM products. HEWs and HC staff reported having gained confidence in the precision of re-order estimates when IPLS tools were used for resupply, and a sense of increased efficiency, order, and transparency in the resupply process, which translated into the expectation that product "gaps" were of course reduced. However, the survey still found a range of stock imbalances, despite the HP level successfully using IPLS tools because there continues to be products that are not supplied based on the HPMRR but are pushed in fixed quantities from higher levels. The pushing of products is due to the different sources of budgetary support and different procurement processes for different iCCM products that result in these products only being provided on an ad hoc basis and not based on the IPLS procedures.

The conditions under which iCCM stock imbalances might improve seem to be present. In recent years, the SC4CCM project has partnered with other iCCM partners to conduct an iCCM specific quantification. Nevertheless, until now there has not been a coordinated approach to utilizing the quantification results. However, we verified that iCCM will become an identified program within FMOH: this should simplify the financing streams for different iCCM products so that the quantification and optimal procurement processes through PFSA can be more closely followed. A newly established Logistics Management Unit within FMOH is tasked with coordinating the SCM processes between FMOH and PFSA that should support this streamlining, and ultimately, the transition to a pull system for iCCM products.

The risk with the current situation of good IPLS operationalization at HP level without actual improvement in product availability is that, if stock imbalances continue, there will be reduced motivation among HEWs and HC staff to use the tools correctly and routinely, to continue to provide follow-up and support for IPLS by HEWs, and to continue to regard the IPLS as "a good thing." The timing of the endline assessment in relation to the successful operationalization of the IPLS at HP and between HC and HP means that while it is too early to assess the size of this risk, it is a reasonable hypothesis. Although users of IPLS for HEWs in the case study are enjoying a better sense of control and insight regarding iCCM supplies right now, they may start to lose that if iCCM product stock imbalances do not improve in response to their correct and skilled use of IPLS.

Institutionalization and Scalability

Institutionalization of IPLS for HEWs

Leadership and ownership at HC and woreda levels were necessary for IPLS institutionalization. In our cases, we found some evidence of **outstanding leadership from PHCU Directors and Store Managers that was catalytic to IPLS operationalization and institutionalization**. Leadership at these levels, and in particular from the PHCU Director, was critical to supporting ownership of IPLS among HEWs and ensuring continuous support.

The evidence shows that **there is organizational capacity to transfer knowledge and skills for IPLS to HEWs and to provide reinforcement of skills** through continued support as described in earlier sections. Activities such as supervision and PHCU meetings are ongoing activities at the HC, and by leveraging these opportunities to provide continuous support to HEWs, they will further integrate and institutionalize IPLS for HEWs into routine activities at the PHCU level.

"What role do you play so that institutionalization can occur?" "First I need to transfer the knowledge I have on IPLS by prioritizing what I know and have the pharmacist and medicine dispensing person know about bin cards. Having orientations available is also important. When supervisors are rotated, we need to orient them and they should know how to fill checklists. OJT needs to be prioritized. When it is asked what IPLS is, everyone should know. However, this can only happen if there is institutionalization. For example, if the pharmacist isn't here, this means that others here, such as nurses, should know the things the pharmacist does, etc. The work of the pharmacist should not stop because he/she is temporarily unavailable." ~HC A2: PHCU Director

"What is the role of other staff concerning IPLS?" "Change can only happen if we are all working together. So there needs to be commitment by all staff. They need to know about IPLS products, what medicines need to be ordered first, about FEFO. So by having all staff know IPLS, this will be good and result in ownership of IPLS by everyone." ~HC A2: PHCU Director

"What is your role with regards to IPLS?" "… I also discuss the HEW's reports with the store manager and dispensing unit. We look at incomplete reports. During the PHCU meetings, we discuss skill gaps with HEWs, and this way, we are able to see eye to eye with them. We also work to try and make other offices/departments that we have here functional. I try to monitor staff so that they are coming in at the proper times so they come in and do work. If there is a staff member that is off work because of an illness for maternity leave, I try and find a replacement for them as soon as possible. I also try to solve quantification problems by talking to the store manager about it. I also encourage HEWs to bring expired medicines here so that we can dispose of them." ~HC B1: PHCU Director

"It was hard to train them [HEWs] at first because they were expecting to get paid. But we made them believe that it was all in their best interest, that the gaps in IPLS were hurting them. It's all for their good. They still had gaps in IPLS, but we followed up with them closely. We showed them how to use bin cards, how to transfer information from bin cards to HPMRR, and how to request products." ~HC A2: Store Manager

Our case study participants also provided their thoughts on what would further contribute to the future success and institutionalization of IPLS, which involved increasing the knowledge of IPLS across cadres:

"What do you think is needed to successfully continue IPLS?" "What is expected from us is to institutionalize all supervision. Since there is a lot of shifting occurring at the HC, ***all supervisors should know about IPLS.*** *It would make things better and easier and allow IPLS to successfully continue." ~HC A2: PHCU director*

"Can you please explain what you mean by institutionalization?" "Institutionalization means ***if one person from the HC knows about IPLS and others don't it would lead to problems, so it is necessary that everyone needs to have equal knowledge across the board.*** *Additionally, having a functional routine supply chain system is necessary. Also, supervision from others shouldn't be needed for us to do a good job; this all has to do with institutionalization. I might be here one day or the pharmacist might not be here one day, but having someone ready to take our place also means there is institutionalization." ~HC A2: PHCU Director*

"In your opinion, what needs to be done for IPLS to succeed?" It would be good ***if everyone at woreda knew about IPLS.*** *I shouldn't be the only one who knows; I might be gone tomorrow. And it shouldn't just be the woreda staff members who know about IPLS, but the staff members at the HCs as well. They're the ones providing support and supervision to HEWs, so it's necessary that they know. Using checklists is also helpful. Everyone should be aware for IPLS to be successful. Before, only the pharmacists and the store managers knew about IPLS, but things are starting to change." ~WoHO A1*

Scaling up IPLS for iCCM for HEWs

SC4CCM implemented IPLS at the HC and HP levels as a pilot project in order to learn for scale-up purposes. Overall, our findings show that it is possible to successfully integrate iCCM products into IPLS as has been done with other products such as family planning. Our endline findings show that central level supply chain processes such as quantification, procurement, and distribution of iCCM products need to be addressed simultaneously before meaningful and sustained gains in product availability at the community level can be expected.

Creating Conditions for Successful Scale-Up

Our endline study found sufficient **evidence that current capacity constraints and other barriers to integrating iCCM products into IPLS at higher levels are being addressed at the central level**. For example, we found evidence of a regularization of coordinated systematic quantification exercises and improved coordination between child health program and PFSA Central with the establishment of the logistics management unit. Furthermore, iCCM was established as a program in FMOH with its own budget, and there was opportunity for reorganization and capacity building at PFSA Central. There was also evidence of consistent commitment to move to a pull system, in line with organizational capacity and systems, among key funders and procurers. These developments and plans should allow for iCCM products to be integrated into IPLS processes at higher levels and for fixed quantity kits to be discontinued.

"What do you feel about loose products vs. kits?" "Your question is clear. For new items, delivering kits is preferred. You see, healthcare professionals are not informed on which products to use. When we deliver kits, we're giving them a certain quantity of products that they should use within a specific time period. This is a push system, until they get used to the products. Afterwards, they can request the products they need. Kitting is good during the initial phases, then the pull system can be implemented once the healthcare professionals are used to the products. Our supply chain system is demand-based; it goes upstream. The kit system has to be replaced by continuous RRFs. This is ideal supply chain. The kit system is a push system, but for new products, we need to dictate which products the facilities should be using so that they can request for these products themselves later on." ~PFSA Central: Forecasting and capacity building unit

"What is the plan for the kits?" "As long as the system is not there, the kit is a bridging strategy. This is a very difficult question coming, about when to stop the kits. If we work for the pull system now, then it will be shorter. [We] are not for kits now, but it can be implemented to close gaps sometimes, like a mixed system. PFSA also says that they are using mixed system - but the main work will be for pull system." ~ Central level partner

*"Why do you think you are now on your way?" "We have been having discussions with PFSA, Logistics Unit, child health team, MNCH in FMOH [about integration]. Integration take time, the health system is not ready to request. We are going to introduce, turn by turn, according to the maturity of the iCCM program. There was phased introduction of the iCCM, some were in 2012, some in 2013, so there is not uniform maturity of the iCCM program. IPLS should not be phased – should be all over the country, should be blanket. iCCM should be in place and have maturity. In some cases there will be gaps – until it will be uniform we will provide the replenishment kits to fill the gap." ~*FMOH

The iCCM program currently operates in more than 14,500 health posts in 86% of districts. It has recently been determined that the iCCM is a program, with its own budget and budget line for supplies, and a clear source of financing has been identified. This will facilitate the scale-up of iCCM and the system for managing the products needed for the iCCM program, namely IPLS. Other programs, such as family planning and ART for HIV, have integrated their related products into IPLS; the expectation is that iCCM, with its new status as a program, will also be able to do this. The iCCM roll-out and program maturation goes hand-in-hand with demand creation activities and FMOH/HSDP priorities.

Translating the Pilot for Scale-Up

An important finding from the endline evaluation is that some things were done exactly according to original project implementation strategy; however, the design of Phase 2 was to be adaptive and ensure that essential supply chain functions could be integrated into routine work while maintaining operationalization of the IPLS at the HC and HP levels. This is a positive indication of the scalability of the IPLS and the potential for institutionalization and sustainability (Appendix 7).

During the pilot, the SC4CCM provided a variety of support inputs for start-up and implementation (Table 11). As IPLS for iCCM is scaled up, it will be necessary to translate the types of inputs and support that the project provided during the pilot into alternatives that can feasibly be provided by the woreda, zone, or RHB.

Table 13: Summary of activities conducted by SC4CCM during the intervention period

Timeline	Activity/Inputs	Description
June 2013, July 2013, September 2013, Jan 2014	Supervision	visited each HCs each round and at least one HP per HC, used integrated check list, built woreda and HC capacity
August 2013, January 2014, March 2014	Review Meetings	reviewed supervision data to identify gaps and developing action plans to address these
December 2013	HEW Refresher Trainings	co-facilitated IPLS for HEWs refresher training with HC pharmacy staff, used for building both capacity of HC and HEWs
January 2014	Orientation to HP supervisors	provided a one or hour orientation to HP supervisors (non SC specific) on IPLS for HEWs

The key for cost-efficient scale-up will be to ensure effective initial training, with a variety of follow-up inputs planned for and budgeted, that focus on supporting the HC as a learning center for IPLS. An important question will be how to maintain knowledge and skills in using IPLS for iCCM products, considering the critical issue of high staff turnover, especially at the HC level.

Recommendations

Based on the results of the endline evaluation and discussions of the results with relevant stakeholders from the two pilot regions (participant lists are included in appendix 8), the following recommendations were jointly developed by SC4CCM and stakeholders in four key areas: operationalization of IPLS for HEWs, scaling up the IPLS for HEWs, institutionalizing the IPLS for HEWs, and finally, ensuring iCCM products are integrated into IPLS from the central level down to the HP level.

1) Operationalization IPLS for HEWs

Adequate training of HEWs is important for the operationalization of IPLS for HEWs. To keep training of HEWs affordable, it is possible to train HEWs using HC staff. To achieve this, training sessions at the health center should be conducted that focus solely on IPLS to ensure adequate emphasis and time is made available for supply chain skills. This training could be arranged to coincide with other HEW activities at the health center. Alternatively, it is feasible that HEWs could also be trained during other HEW training sessions conducted at woreda or zonal level but only if adequate time and attention is given to IPLS: for the IPLS lessons this is at least five hours and should be facilitated by supply chain staff. However, this was not tested in the pilot.

The quality of training is very important: the evaluation results showed that the quality and methods of training varied across the different HCs. Therefore, one recommendation would be to have staff from the woreda or zone at trainings to ensure HC staff conduct the training using the recommended participatory methods outlined in the training curriculum. This will help standardize the methods and quality of training across the various health centers. Woreda or zonal staff can also emphasize the importance of the training to HEWs.

Results from the endline evaluation also showed that the initial training was often insufficient for HEWs to fully grasp all the concepts of the IPLS, especially for more complex tasks of bin card and HPMRR completion, which made it more difficult to operationalize all skills associated with IPLS. Following the initial training, some combination of continued follow-up and support is needed regardless of the type or quality of the initial training that HEWs receive on IPLS. The HC as a learning site creates opportunities to provide that support during activities: this offers a feasible, cost-effective approach to providing continued support for making IPLS operational for HEWs. It is therefore recommended that following the initial training, the PHCU Director and HC Store Manager monitor the skill levels of the HEWs and their use of the recording and reporting tools. They should then provide a combination of continued follow up and support activities based on the need of the HEWs within their PHCU. This continued follow up and support could include refresher trainings to all HEWs to fill widespread gaps in knowledge or skills. The follow up could also entail OJT during onsite supervision that addresses individual gaps in using tools and addressing storage challenges, or individual training when HEWs come to the HC to submit reports and collect products. Moreover, PHCU meetings could include IPLS in order to collectively discuss and solve barriers to implementation of IPLS and product availability challenges.

2) Scaling up IPLS for HEWs beyond the pilot areas

In order to scale up IPLS for HEWs beyond the pilot areas, strong leadership and commitment from the FMOH, RHB, ZHD, and PFSA Central and hubs will be necessary to support scale up. As the pilot was only in a small number of sites, we did not see the need for central level support; however, on this smaller scale, we saw how important the zone and woreda were for emphasizing the importance of this activity to HC staff and HEWs.

The SC4CCM project has provided evidence on the effect its inputs had on improving IPLS for HEWs. Therefore, translation of these inputs into feasible health systems functions along the different levels of

IPLS will be an important step in scaling up IPLS for HEWs. Commitment and leadership from the higher levels can help in moving this process forward and promoting buy in from areas beyond the pilot areas. It will also be important to consider the roles that existing logistics and iCCM partners can play in IPLS for HEWs scale up. For example, these future roles could include the training of trainers for PHCU Directors and Store Managers where no training has yet taken place, conducting orientation to woreda and zonal staff to build leadership and ownership, and reinforcing IPLS skills during routine support provided by these partners. In addition, promoting peer-to-peer learning and problem solving approaches through use of review meetings will promote ownership at the different levels, which in turn will enable scale up of IPLS for HEWs.

It should also be noted that the SC4CCM intervention focused mainly on PFSA direct delivery sites. For non-delivery sites who receive products through the woreda, including the woreda more fully during training and implementation will be especially important for scaling up IPLS for HEWs.

3) Institutionalizing IPLS for HEWs at all levels

Evidence of institutionalization is limited in this evaluation to case study HCs as it is difficult to measure institutionalization using survey data. However, for the case study sites, what was clear was that leadership and commitment from PHCU Directors were critical to ensuring that IPLS for HEWs was considered a priority at the HC. If IPLS for HEWs is to be scaled up nationwide, then it will be necessary to institutionalize IPLS at PHCU level but also at central and regional levels of government. This will require the kind of leadership and commitment seen at PHCU level in the pilot to be present at higher levels from FMOH, RHBs, ZHDs, and WoHOs.

It will be essential that at the PHCU level, the PHCU Director and Store Manager are encouraged to leverage existing opportunities to provide continuous support for HEWs in IPLS. During the pilot, we saw a combination of follow up support activities be used to fill gaps and reinforce skills; these were most successful when combined with already existing activities where HC staff and HEWs interacted, such as supportive supervision, PHCU meetings, and during resupply of products. By integrating this activity with already existing structures and routine activities, IPLS for HEWs can become part of standard business practice. Such opportunities include but are not limited to refresher trainings at the HCs, integrated supervision on IPLS, OJT during resupply, and inclusion of IPLS issues in the PHCU meeting agenda—all of which are important findings from the endline evaluation.

A major risk that continues to exist is staff turnover at HCs, and therefore, planning for staff turnover is important. In the case study sites, it was clear that IPLS for HEWs was being institutionalized into the orientation or replacement training for new staff. It will be important to ensure that as IPLS for HEWs is scaled that this continues to be the practice and that HCs are encouraged to ensure that more than one person/member at the HC are trained on IPLS for HEWs. Another way of addressing this issue, as seen in the case study, was training more than one person at the HC in IPLS.

Another recommendation for institutionalizing IPLS for HEWs suggested through regional dissemination meetings and not as a result of this evaluation entails incorporating IPLS as an evaluation criteria for staff in professional development plans at all levels. This will ensure that IPLS and IPLS for HEWs are recognized by all staff as the supply chain system that is owned and prioritized by the FMOH.

4) Integrating iCCM products into IPLS

ICCM products at this stage are not integrated into the IPLS at the central or regional level as is evident by the findings in the evaluation. While the HC and HPs in the pilot were following the IPLS procedures, products were still being pushed to the HPs in fixed quantities rather than following the HPMRR. This resulted in major stock imbalances of iCCM products at HC and HP. To address this, iCCM products need to be quantified, procured, and distributed using IPLS procedures at all levels from the central level to the HP.

First and foremost, iCCM needs to be considered as a program similar to other programs such as family planning. In this light, there should be dedicated financing for iCCM products, and these products should be procured through the PFSA mechanism to support the iCCM program. There needs to be a plan developed to conduct an annual quantification specifically for iCCM products so that adequate resources can be set aside for procurement, supply plans can be developed, and procurement coordinated. If any partner-supported iCCM products should also flow through Central PFSA and the IPLS rather than through parallel distribution systems, then the procurement should be coordinated and based on supply plans that resulted from the quantification.

iCCM products must also be pre-printed on RRF (which is already underway), thereby ensuring that requests of iCCM products are systematically conducted in the same manner as other program drugs. This will mean that resupply of HP iCCM products can be and should be based on consumption using the RRF and HPMRR in an effort to supply adequate amounts of drugs and prevent overstocking, understocking, and stockouts of iCCM drugs.

Additional recommendation: Health care financing

One additional recommendation that was not fully explored in this evaluation should be considered by policy makers as the IPLS for HEWs is fully scaled up and as iCCM products are integrated into IPLS. There appears to be some disconnect between the health care financing (HCF) policy and the PHCU directives. The HCF policy indicates that product procured using HCF should only be used for services where costs are recovered; however, the PHCU directives indicate that the HC is responsible for ensuring HPs can provide their services, and this includes provision of health products. It is recommended that practical guidelines are developed to help HCs navigate between these two directives so that HCs can be empowered to address supply shortages at HP level.

Closing Statements

The SC4CCM pilot project demonstrated that it is possible to operationalize IPLS at the HP and between the HP and HC. Successful operationalization of IPLS for HEWs is supported by the survey data from all HPs and HCs and by findings from the qualitative case study. The successful operationalization of the IPLS for HEWs and HCs for HEW resupply required a variety of inputs: training, follow-up and continued support, and leadership. Both HEWs and HC staff recognized a range of benefits from using IPLS, and they felt that it made their work easier.

All of these inputs – IPLS training at HC level for HEWs, follow-up and continued support by HC, and leadership – are necessary for building the skills and knowledge for correct use of the IPLS by HEWs, but a chain of leadership for IPLS at multiple levels above the HP is the primary enabling factor for operationalizing IPLS for HEWs.

The survey data showed that overall product availability improved or stayed the same, except for zinc, in both regions. However, the picture is complex, and more work is required to fully integrate iCCM products into IPLS. While product availability is widely considered to be the best indicator of supply chain performance, in the case of the IPLS for HEWs, iCCM product availability is not the best indicator for measuring operational success because there continues to be both push and pull supply systems at higher levels for different iCCM products and different sources of budgetary support for different iCCM products, despite a consolidated quantification process being in place.

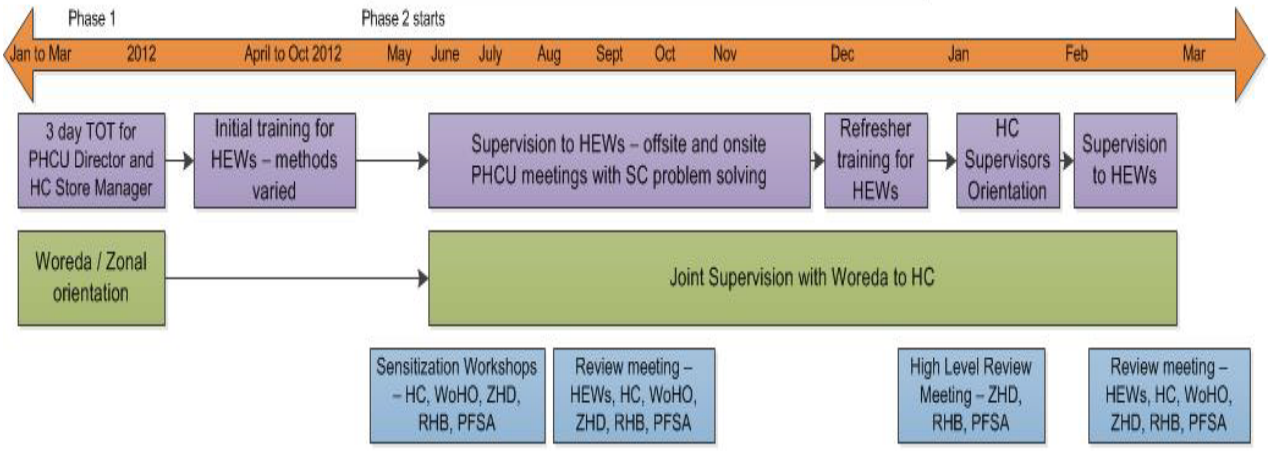
The conditions under which iCCM stock imbalances might improve seem to be present. The risk with the current situation of good IPLS operationalization without improvement in product availability is that, if stock imbalances continue, eventually there will be reduced motivation among HEWs and HC staff.

Conditions for scaling up IPLS to all HEWs and integrating iCCM products into IPLS so that the program can move away from kits appear favorable, based on our endline findings. Our qualitative data show that IPLS knowledge, practice, and benefits recognition were institutionalized at HP and HC levels in our case study, and we believe this success could be replicated in other health centers, zones, and regions. The endline survey data show IPLS performance indicators at sufficiently high levels to conclude that IPLS for HEWs was largely operational in all pilot sites. However, a major risk to scale-up of iCCM IPLS for HEWs is the high staff turnover at HC level, and the case study data provide lessons for how to minimize that risk. The other key for cost-efficient scale-up will be to ensure effective initial training, with a variety of follow-up inputs planned for and budgeted, that focus on supporting the HC as a learning center for IPLS.

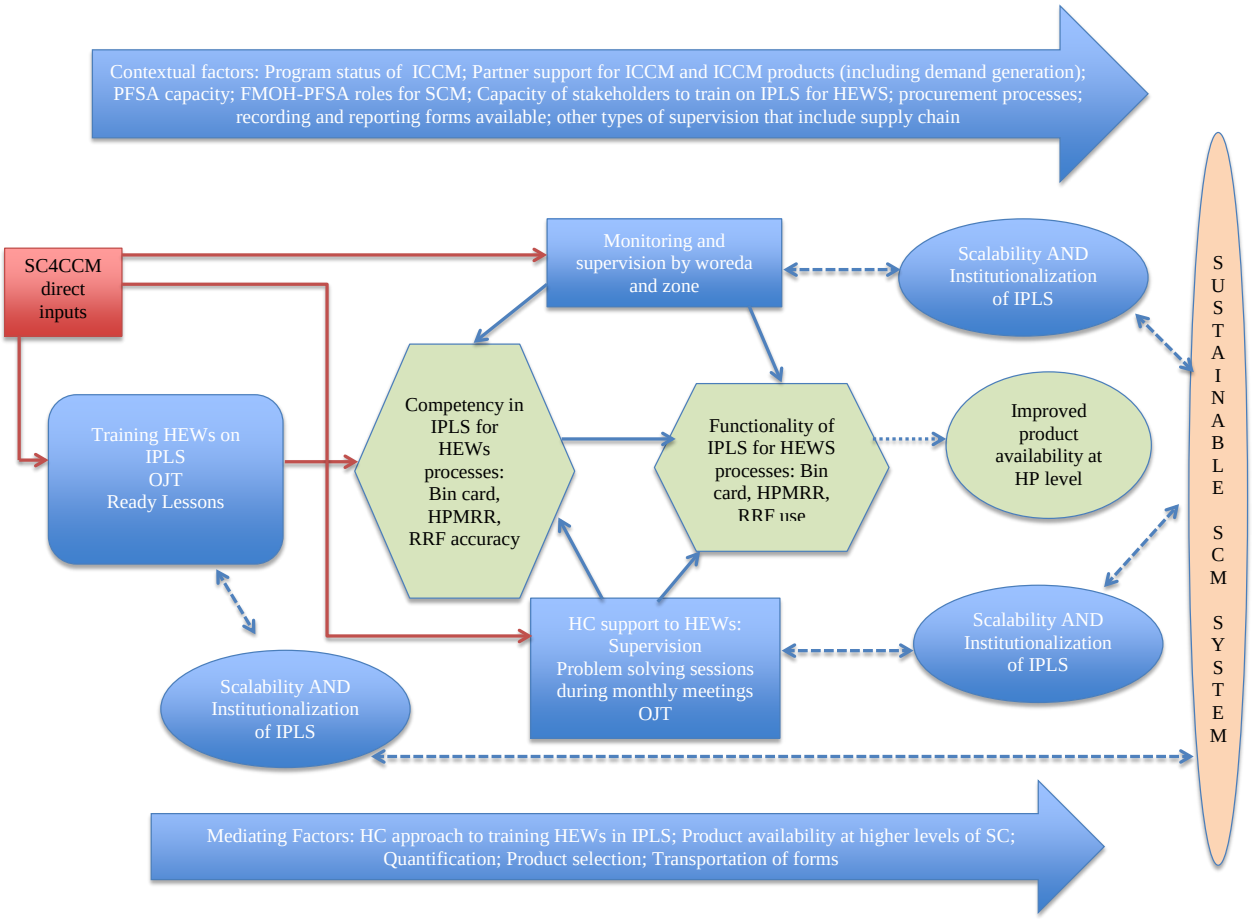
Our case study shows that **the HC functions as the learning site for IPLS for HEWs and is enabled by the active engagement of both the PHCU Director and the Store Manager.**

The risk with the current situation of good IPLS operationalization without actual improvement in product availability is that, if stock imbalances continue, there will be reduced motivation among HEWs and HC staff to use the tools correctly and routinely, to continue to provide follow-up and support for IPLS by HEWs, and to continue to regard the IPLS as “a good thing”. The timing of the endline assessment in relation to the successful operationalization of the IPLS at HP and between HC and HP means that while it is too early to assess the size of this risk, it is a reasonable hypothesis. Although users of IPLS for HEWs in the case study are enjoying a better sense of control and insight regarding iCCM supplies right now, they may start to lose that if iCCM product stock imbalances do not improve in response to their correct and skilled use of IPLS.

Appendix 1: Timeline of Activities



Appendix 2: Initial Conceptual Framework for Assessing IPLS Functionality, Institutionalization, and Scale-up

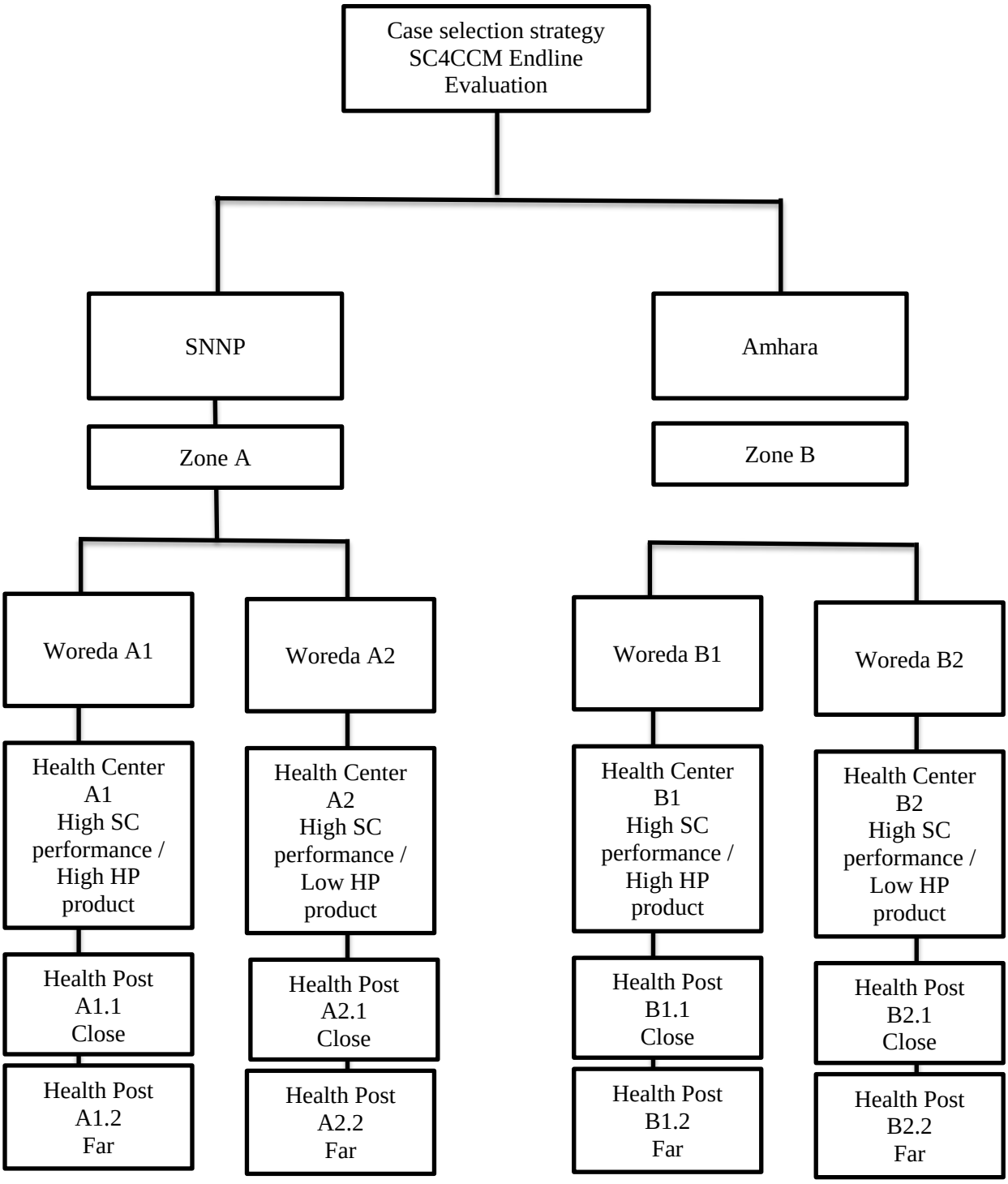


Appendix 3: List of Intervention Sites

Woreda	Health Center
Hadiya, SNNP	
Soro	Gimbicho
Soro	Kosha
Misha	Geja
Misha	Morsito
Gibe	Homecho
Duna	Bure Bulshana
Gombora	Bushana
Gombora	Sege
Shashago	Bonosha
Shashago	Doesha
Anlemo	Fonko
Lemo	Lisana
Lemo	Shurmo
Misrak Badewacho	Korga
Misrak Badewacho	Shone
West Gojam, Amhara	
Dega Damot	Feres Bet
Mecha	Merawi
Yilmana Densa	Adet
Bahir Dar zuria	Kinbaba
Jabetehenan	Jiga
Dembecha	Debecha
Burie zuria (Burie Shikudad)	Kuchi

Burie ketema	Burie
Wenberima	Shindi
Gonge Kolela	Adis alem (Gonji)
N.achefer	Liben
S.achefer	Durbete
Sekela	Geshe Abay(Sekela)
Quarit	Quarit
Yilmana Densa	Agita
N.achefer	kunzla

Appendix 4: Case Selection for SC4CCM Qualitative Endline Case Studies



Appendix 5: Performance Indicators Used for Case Selection

Product Availability at Health Post

- Average percent in stock of 14 tracer products over all rounds of supervision for those HPs visited by HC
  - Coartem 1X6 (ACT)
  - Coartem 2X6 (ACT)
  - Coartem 3X6 (ACT)
  - Coartem 4X6 (ACT)
  - *Cotrimoxazole 120mg
  - Oral Rehydration Salts (ORS)
  - Malaria rapid diagnostic tests (RDTs)
  - Mebendazole 100mg of 100
  - Paracetamol 100 mg of 1000
  - Tetracycline eye ointment 1% tubes
  - *Zinc 20mg
  - Condom (male)
  - Depo provera
  - Pills (combined oral pills)

  * Chosen as an indicator for product availability

Performance on Key SC Processes at HC and HP

Health Center

- Reporting RRF accurately (regularly and on time not included because it was good across all facilities)
  - RRF calculations accurate
  - RRF data is valid
- PHCU meeting frequency
  - PHCU meeting at least monthly reported by pharmacy staff (director not included
  - Discussed SC issues at PHCU meeting reported by pharmacy staff
- Use tracking tool
  - Use of tracking tool report by director and pharmacy staff

Health Posts for that HC

- Reporting HPMRR consistently and accurately
  - HPMRR submitted consistently and regularly
  - HPMRR On Time
  - HPMRR accurate
- Recording on bin cards consistently and accurately
  - Are BCs in use
  - Are they up to date
- Receiving the right quantities
  - HP get the right quantity required in the last month

Appendix 6: Data Collection Plans for Each Level[7]

Data collection plan for Health Posts

The team will conduct at least five data collection activities at health posts:

1. In-depth interviews with HEWs
2. Review of bin cards
3. Review of HPMRR
4. Supervision/Feedback log book
5. Photos – for storage room (bin card usage, organization) and health facility

Data Collection Plan for Health Centers

The team will conduct at least 6 data collection activities at the health center:

1. In-depth interviews with key health center staff (PHCU Director, Store Manager)
2. Review of bin cards
3. Review RRF for HP products
4. Review of HPMRR
5. Review Order fill rate (OFR)
6. Supervision/feedback log book and tracking tool
7. Photos

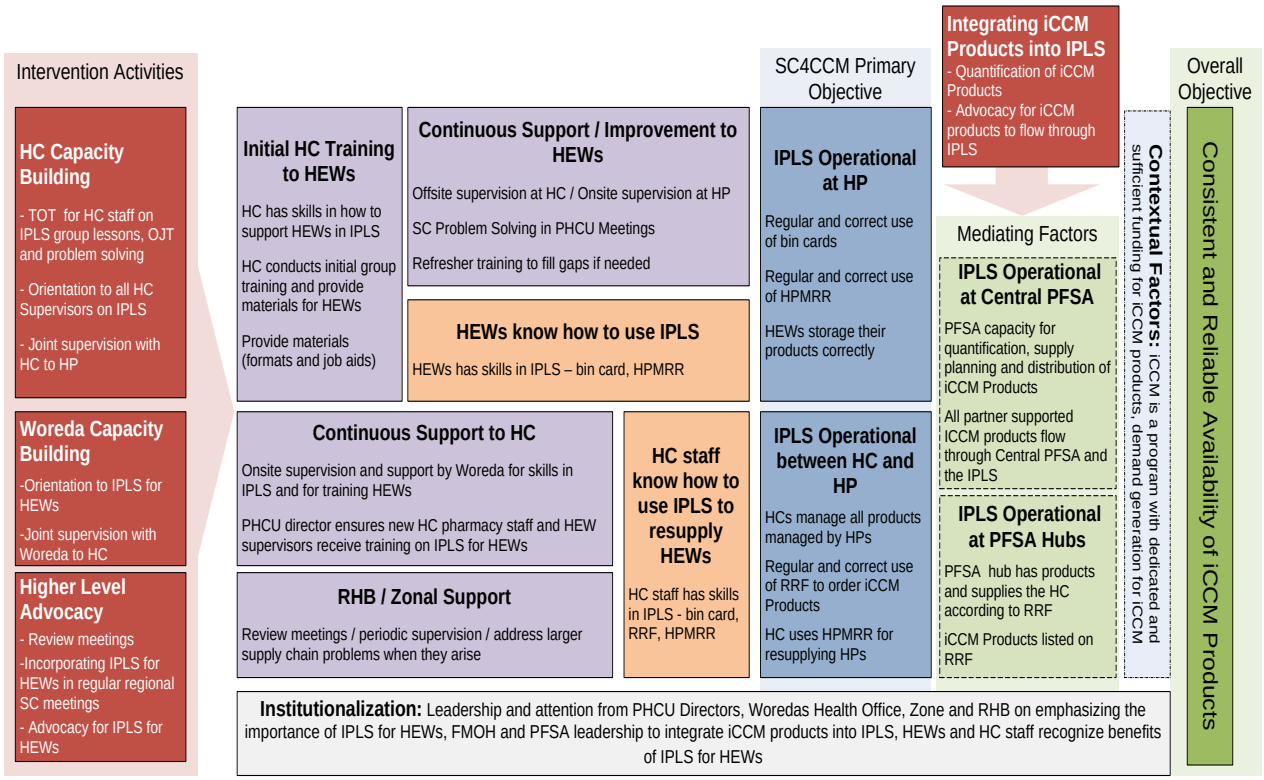
Data Collection Plan for RHB, ZHD, Woreda HO, and PFSA Hub

The team will conduct at least one data collection activity at each facility:

1. In-depth interviews
2. Supervision/feedback log
3. Review meeting minutes
4. Observations (PFSA hub only):
    a. Observation of HPMRR and RRF from HCs for selected HCs
    b. Observation of RRF at each PFSA hub (Look for: How many? For which months? Which products?)
    c. Observe how they are using the RRF to issue products

[7] Source: SC4CCM Case Study Field Manual

Appendix 7. Program Impact Theory for IPLS, Based on Endline Evaluation Evidence



Appendix 8: List of Participants at End of Project Dissemination

	Name	Institution	Responsibility
1	Dllu Kassim	Jarco	Program Coordinator
2	Seifu Tadesse	Jarco	ROM
3	Sami Tewfik	USAID|DELIVER	Technical Director
4	Dessalegne Tesfaye	USAID	Pharm. Logistics Specialist
5	Hailu Abebe	FMOH	Newborn Care Advisor
6	Amano Eyob	L10K	Technical Advisor
7	Dagim Damtew	FMOH	Logistic Officer
8	Atrie Fkedu	Save the Children	iCCM Program Coordinator
9	Paul Dowling	USAID|DELIVER	Country Director
10	Abubeker Hussien	CHAI	Senior Associate
11	Hailemariam Legesse	UNICEF	Health Specialist
12	Elfnish Bekele	FMOH	Officer
13	Henok Gezahegn	Micronutrient Initiative	Country Director
14	Azeb Fisseha	USAID|DELIVER	Regional Director
15	Abraham G/georgies	WHO	NPO
16	Abebe Kassahune	PFSA	FCBO
17	Ferew Tafaye	IFHP	DTD
18	Meron Paulos	PATH	PO
19	Yasmin Chandani	JSI/SC4CCM	Project Director
20	Sarah Andersson	JSI/SC4CCM	Country Technical Manager
21	Solomon Gelaw	JSI/SC4CCM	Regional Community Health Logistics Advisor
22	Hanna Mengistu	JSI/SC4CCM	Regional Community Health Logistics Advisor
23	Alemayehu Nigatu	JSI/SC4CCM	Resident Logistics Advisor
24	Gadissa Homa	JSI/SC4CCM	Regional Community Health Logistics Advisor