# ETHIOPIA

## Health Post Supply Chain Baseline Assessment Report

July to September 2010


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PHARMACEUTICALS FUND AND SUPPLY AGENCY

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የጤና ጥበቃ ሚኒስቴር
Federal Democratic Republic of Ethiopia
Ministry of Health

JSI

SC4CCM
Supply Chains 4 Community Case Management

# Ethiopia

## Health Post Supply Chain Baseline Assessment Report

July to September 2010

**SC4CCM Project**

The Improving Supply Chains for Community Case Management of Pneumonia and Other Common Diseases of Childhood (SC4CCM) project is a five-year initiative funded by the Bill & Melinda Gates Foundation. It is implemented by JSI Research and Training Institute Inc, in three African countries: Malawi, Ethiopia, and Rwanda.

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**Recommended Citation**

SC4CCM. 2010. *Ethiopia Health Post Supply Chain Baseline Assessment Report.* Arlington, Va.: SC4CCM.

Cover photo: Medical supplies storage at a health post in Tigray Region, Ethiopia

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# Acronyms

| | |
|---|---|
| ACT | artemisinin-based combination therapy |
| ARI | acute respiratory infection |
| ART | anti-retroviral infection |
| CCM | community case management |
| CHW | community health worker |
| COC | combined oral contraceptives |
| DMPA | depot-medroxy progesterone acetate |
| EPI | Expanded Program of Immunization |
| FMOH | Federal Ministry of Health |
| FP | family planning |
| HC | health centre |
| HEW | health extension worker |
| HIV | Human Immunodeficiency Virus |
| HP | health post |
| ICCM | integrated community case management |
| IFHP | Integrated Family Health Program |
| IPLS | Integrated Pharmaceutical Logistics System |
| JSI | John Snow, Inc |
| L10K | Last Ten Kilometers |
| LIAT | Logistics Indicator Assessment Tool |
| LSAT | Logistics System Assessment Tool |
| NGO | non-governmental organization |
| ORS | oral rehydration salts |
| PI | principal investigator |
| RDT | rapid diagnostic test |
| RHB | Regional Health Bureau |
| RUTF | Ready-to-Use Therapeutic Foods |
| SC4CCM | Supply Chain for Community Case Management |
| SCM | supply chain management |
| STG | standard treatment guidelines |
| TB | tuberculosis |
| TOC | Theory of Change |
| WoHO | Woreda Health Office |
| ZHD | Zonal Health Department |

# Acknowledgements

We would first like to thank Bill and Melinda Gates Foundation for extending funding support for this assessment. Had it also not been for the commitment of the Federal Ministry of Health of the Ethiopian Government, Regional Health Bureaus and Pharmaceuticals Fund and Supply Agency, this assessment wouldn't have been practical. The participation of integrated community case management technical working groups at national and regional levels was so commendable to guide the methodology and validate the findings of the data.

We also would like to extend our gratitude to JaRco for recruiting, training and deploying competent data collectors who use phones for data collection at ease. In addition, the management of the consulting firm and principal investigators involved in the data collection and data cleaning deserve appreciation for responding to our requests timely.

The participation of Zone Health Departments and Woreda Health Offices in data collection and validation of the data was of great help. Their involvement in the facilitation of the process helped the project to complete the data collection in a timely manner.

Lastly, but not least, our heartfelt gratitude goes to those professionals at various levels of the health system who were willing to give us their time to go through our long list of questions.

- SC4CCM Project Team

# Introduction

Forty percent of deaths in children under five globally and over 60% of deaths in post-neonatal children are attributable to three conditions: acute respiratory infections (ARI), malaria and diarrheal diseases. In sub-Saharan Africa, 53% of deaths in children under five are attributable to these three conditions.[1] Additionally, 43% of children in sub-Saharan Africa suffer from under-nutrition or malnutrition, and, globally, under-nutrition or malnutrition is the underlying cause of death in more than 30% of under-five deaths.[2] This harsh reality has influenced governments and non-governmental organizations (NGOs) to adopt a variety of approaches to deliver life-saving essential health services for young children, including community case management (CCM). Although the range of child health interventions offered by community health workers (CHWs) at the lowest level is relatively limited, ensuring a regular supply of the essential medicines and supplies needed to effectively treat sick children is often problematic. And the challenges around product availability are multi-fold, ranging from a lack of supplies at the community level to lack of data about the supplies at the national level.

Solutions for overcoming supply chain constraints for existing national public health programs, are well-documented, and in many cases have been successful in improving product availability for priority programs such as Human Immunodeficiency Virus (HIV), tuberculosis (TB), family planning (FP) and Expanded Programme on Immunizations (EPI). The vast majority of these successful supply chains, however, end at facilities and many of the known solutions are primarily relevant for addressing supply issues that plague the central, intermediate and facility levels. Meanwhile, community-based distribution programs are increasing in number, scale, and scope yet the specific supply chain interventions that facilitate product availability at the community level are not widely known or documented. While general supply chain principles do not change by level, the specifics of how they are applied do vary by level, and it's the specifics that determine how well systems perform. Currently, when supply chains extend beyond facilities into communities, they are often an add-on to the facility-based model, and may not have a purposeful design or may not incorporate the needs of communities.

The Supply Chain for Community Case Management (SC4CCM) project will demonstrate that interventions targeted at improving supply chain performance at the community level exist and can be applied at scale. Identifying and testing a variety of models will provide the country and the global community with an understanding of solutions that work, how they work and the environment required to foster their adoption.

The SC4CCM project identified Ethiopia as one of the priority focus country, since Ethiopia is one of the countries with emerging and promising CCM programs.

# SC4CCM Theory of Change

The SC4CCM project has developed its own Theory of Change (TOC) to serve as a technical framework for the project and guide the process of improving supply chain performance at the community level. The TOC identifies the long-term goal being sought (or main problem that must be addressed) and its relationship to those preconditions that are necessary in order to achieve the goal or solve the problem. The TOC then lays out the pathways for making progress for each precondition.

Within the context of the project, the country level goal that must be achieved is the availability of CCM products at the health post (HP) level when, and in the quantities, needed in order for HEWs to treat all sick children who present at their health post with common childhood illnesses. The goal level hypothesis of the project is that if effective and efficient supply chain systems can be created to ensure that health extension workers (HEWs) have consistent access to sufficient quantities of high-quality, affordable essential medicines, they will be able to dramatically improve care and treatment for children. This will ultimately contribute, along with other CCM interventions outside of SC4CCM, to the overall goal of reducing childhood mortality for children under five from treatable diseases.

Achieving sufficient supplies of essential CCM products at the HP level requires all of the following preconditions to be met:

1. Necessary, usable, quality CCM products must be available at HP resupply point(s)
2. HEWs, or the persons responsible for CCM resupply, need to know how, where, what, when and how much of each product to resupply and act as needed
3. Goods must be routinely transported between resupply points and HEWs
4. HEWs must have adequate storage: correct conditions, security and adequate space
5. HEWs must be motivated to perform their roles in the CCM supply chain

Designing and testing practical interventions that overcome obstacles to the above preconditions and significantly improve CCM product availability at HP level at scale in low-resource settings is the focus of this project.

These preconditions are also dependent on the status and condition of other lower level preconditions that must in the first stage be met if the upper level preconditions are to be achieved. The key implication from this recognition of multi-tier preconditions is that in order to effect meaningful change, the basic building blocks of the system will need to function as expected if the ultimate goal of improving product availability is to be achieved. Hence, the change must address the foundation of the system. The significance of the TOC model is that it forces stakeholders to critically think through those factors that will impact on the program and therefore anticipate data sources that will need to be monitored in order to facilitate assessment of progress and achievements over time towards the desired goal.

The ability to achieve the desired long term project goal and impact directly depends on the existence of necessary pre-conditions at the different levels they exist.

Appendix A presents a diagrammatic illustration of the Theory of Change Model that underlies the SC4CCM project.

# Methodology

## 2.1. Preparation

### *a) Instruments*

#### *Qualitative tool*

This baseline assessment applied the Logistics System Assessment Tool (LSAT) as its main qualitative instrument. The LSAT proceeded as a two-day group workshop and discussion covering all areas of a logistics system and collecting responses that the project will score and use to track as indicators over time. SC4CCM modified the LSAT tool to focus on HP-level supply chain issues in the Ethiopian context. Additionally, qualitative data was collected through key informant interviews and focus groups as necessary.

#### *Quantitative tool*

SC4CCM used the Logistics Indicators Assessment Tool (LIAT) as its main quantitative tool for the baseline assessment. This modified LIAT also focused on HP-level supply chain issues in the Ethiopian context. Survey questionnaires were formatted for and loaded on to smartphones for greater ease and efficiency of data collection. The LIAT collected data to measure core indicators through structured interviews with HEWs, health facility staff and/or warehouse staff at all levels of the system within the integrated community case management (ICCM) initiating regions. Data collection included physically counting the quantity of key CCM products kept at each level of the system (including stock kept by the HEWs), observation of storage conditions and certain aspects of record keeping and reporting.

### *b) Recruiting local evaluation partner*

Aiming at improving efficiency and building local ownership and capacity, SC4CCM selected JaRco as an evaluation partner in Ethiopia based on a competitive proposal process. The role of this local partner was to oversee all aspects of the LIAT fieldwork.

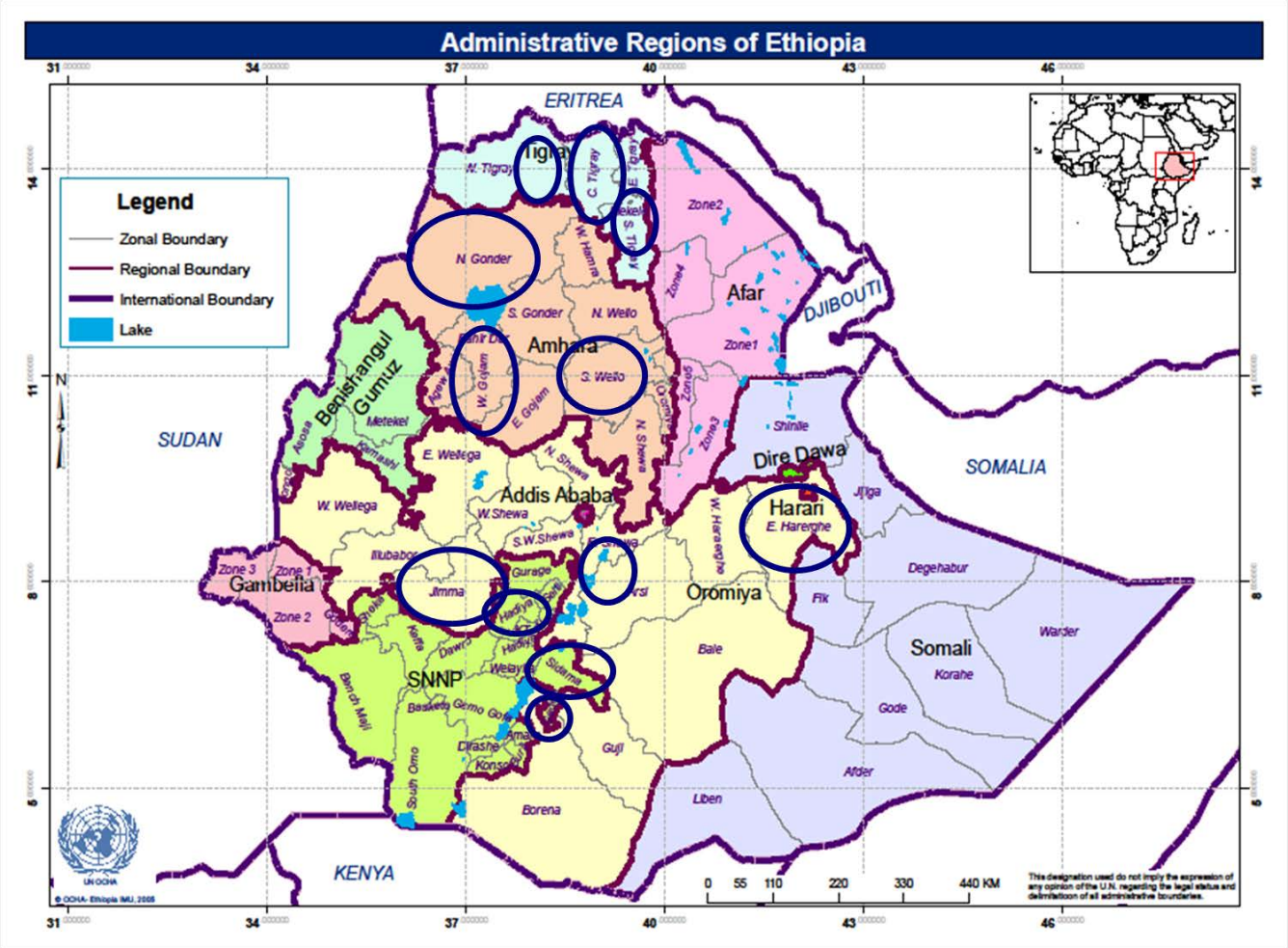
### *c) Data collectors recruitment and Training*

A total of 16 individuals (10 data collectors, 4 supervisors and 2 principal investigators (PIs)) were trained over a period of nine days. Out of the 10 data collectors trained, two were considered replacements in case others were unable to fully participate. The first four days of training were devoted to classroom learning which included building competencies in supply chain logistics and in using smartphones for data collection. The fifth day and half of the sixth day were used to pretest tools in the field, and the afternoon of the sixth day was used to process feedback on pretest experiences. The last two days were used to familiarize data collectors to revised questionnaires (based on the pretest), finalize the translation of the questionnaires into local languages and upload the final version of questionnaires onto the phones.

Additionally over the last two days, key aspects of the survey process were reviewed with the supervisors and enumerators, including the field logistics and sampling guidelines.

The data collectors divided into four teams, each with two data collectors and one supervisor. Each team was assigned to travel to one of the four target regions: Amhara, Oromia, SNNP and Tigray, based on their knowledge of the local language.

***Figure 1: Target Zones***




## 2.2. Sampling and Data Collection

### *a) Sampling techniques and samples*

This survey was purposefully conducted in all four regions where ICCM will be initiated. A half day workshop was held with representatives from the Federal Ministry of Health (FMOH) and all the CCM partners: Last Ten Kilometers (L10K), Integrated Family Health Program (IFHP), Save the Children USA and Save the Children UK; in which three zones, or woredas[1], were selected from each region (at least one for each implementing partners).

The assessment chose regions purposely based on the presence of CCM activities, then selected zones roughly proportional to the number of health posts functioning in each zone, but also considering presence of a range of CCM partners and interventions, including partners with

[1] As there is no zonal administration in Tigray National Regional State, three woredas selected from the region.

whom SC4CCM will work most closely and appropriate geographic, socioeconomic, and cultural variation. Woreda Health Offices (WoHO) under the selected woredas were selected randomly using a probability-proportional-to-size method based on the number of functioning health posts per woreda. The survey also selected health centers (HCs) and HPs randomly within selected woredas for approximately 3-9 HPs per HC. Table 1 below shows the total institutions visited by region.

***Table 1: LIAT Sample***

| Levels of Administration / Facility | Amhara | Oromia | SNNP | Tigray | Total |
|---|---|---|---|---|---|
| Regional Health Bureau (RHB) / Warehouse | 1 | 1 | 1 | 1 | **6** |
| Zonal Health Dept (ZHD) | 3 | 3 | 3 | 0 | **9** |
| Woreda Health Office (WHO) | 10 | 7 | 6 | 3 | **26** |
| Health Center (HC) | 29 | 18 | 18 | 9 | **74** |
| Health Post (HP) | 82 | 80 | 56 | 27 | **245** |
| **Total** | **125** | **111** | **84** | **40** | **360** |

Each team used a visit list of preselected regions, zones, woredas and HCs to carry out their assigned field work. Teams randomly sampled HPs in the field, as guided, based on a lottery method.

### *b) Data Collection*

Data collectors used Nokia e71 mobile smartphones loaded with preset forms to collect the quantitative survey data. The forms were developed using a web-based program called EpiSurveyor. Data collected on the phones were uploaded directly to the EpiSurveyor database, eliminating the need for paper questionnaires and streamlining the data entry process. For the Ethiopia baseline assessment, JSI provided a sufficient number of EpiSurveyor-equipped phones for this purpose. Forms for each level of the systems were finalized by John Snow, Inc. (JSI), adapted from the paper-based LIAT and uploaded to the mobile phone for the data collections. Data collectors, supervisors and principal investigators were trained in mobile phone operation and synchronizing and sending data to JaRco's central office so data records could be uploaded into the database in a scheduled manner. In addition, the data collectors and supervisors were given printed local language versions of all questionnaires for administering the LIAT at all levels in a uniform way.

### *c) Data Cleaning*

Data collecting and inventorying were done according to the steps below:

i. On a weekly basis, supervisors sent data records from the field by email to JaRco's central office

ii. Principal Investigators at JaRco inventoried and cleaned those records on a rolling basis using Microsoft Excel. Each supervisor provided input to resolving questions that arose during cleaning

iii. Principal Investigators at JaRco sent cleaned records in batches to project staff at JSI-Washington

iv. JSI verified inventorying and cleaning and communicated with JaRco about additional issues and questions

v. JaRco provided justifications and corrections upon JSI's request.

## 2.3. Data Analysis, Interpretation and Validation

Project staff first formatted data in Excel for transfer into analysis software. Then, staff analyzed data using STATA and SPSS version 18 software, and categorized results under the five main preconditions of the project's Theory of Change framework. Project staff then presented them to the national and regional level partners and stakeholders for discussion and validation.

## 2.4. Limitations of the Study

Limitations of the study include the following:

i. Use of interview-administered questionnaires may limit openness of the respondents for certain questions

ii. Lack of national/regional database with a complete listing of facility names limited inclusion of some facilities in the sampling frame

iii. Some sampled health posts and health centers were inaccessible due to heavy rains

iv. Some upgraded health centers were not functional and therefore replaced

v. Predictable challenges associated with multi-lingual surveys; to try and address this all surveys were translated into Amharic, Oromiffaa and Tigrinya and data collectors could speak regional language

vi. HEWs without health posts that work out of a health center and use bags to store their items were not included in this survey.

## 2.5. Operational Definitions

**Community Case Management** is an approach to health service delivery intended to facilitate treatment of common childhood diseases in the community by training local community workers in the management of uncomplicated disease and providing them with a stock of simple medicines to dispense as needed.

**Product availability** is defined as having usable supplies on hand at the customer point of interest in a supply chain, e.g. with HEWs at HPs. Maintaining continuous product availability is the primary objective of supply chain management.

**Products managed by HEWs** are products requested, received or reported by HEWs in the last 12 months prior to the date of data collection.

**Tracer drugs** are the key essential medicines recommended for treating pneumonia, malaria, malnutrition and diarrhea; contained in the CCM STG; and used as key family planning

products. The tracer drug list was compiled in collaboration with the ICCM partners and FMOH to reflect the essential medicine and supplies necessary for CCM program in Ethiopia. The tracer list consists of the 14 items in Box 1.

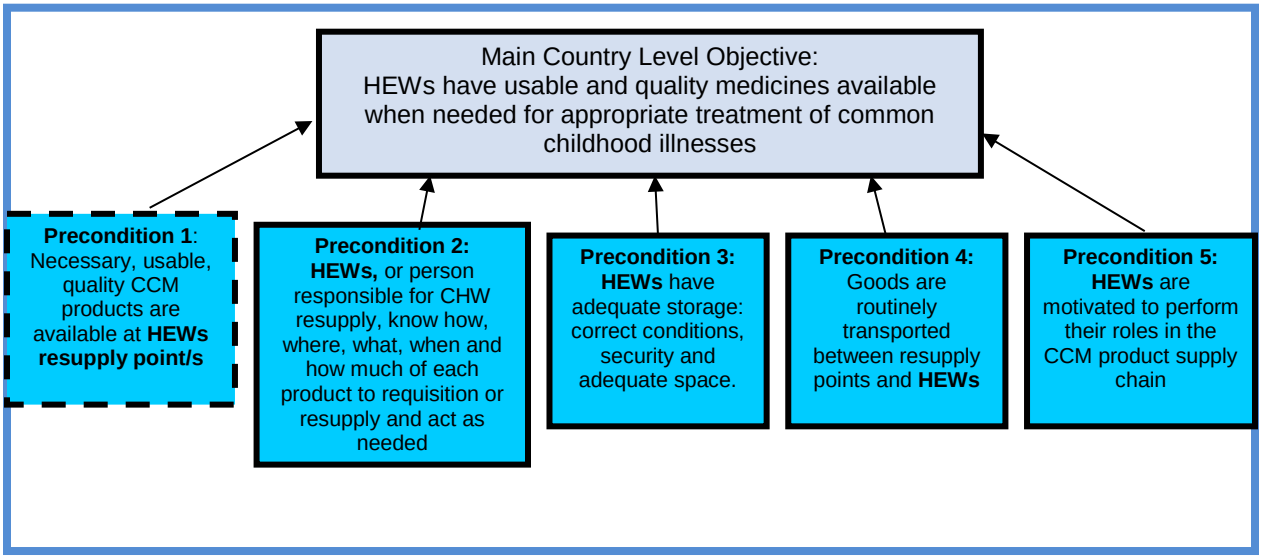
**Storage conditions:** These are the conditions a store should fulfill if it is to maintain the quality and integrity of the health products. The storage conditions assessed in this survey are outlined in Box 2; all ten were assessed at facilities higher than the HP and only the first eight were assessed at HP level.

# Results and discussions

This baseline assessment was designed to assess each of the five main pre-conditions of the project's Theory of Change. By doing so, the project will better understand the extent to which preconditions are in place and what gaps exist that must be addressed in order to achieve the country level objective of ensuring HEWs have usable and quality medicines available when needed for appropriate treatment of common childhood diseases at the community level.

The following findings are presented in relation to the main country level objective as well as the five main preconditions that are theorized as essential to achieving this objective. As previously mentioned there are a number of preconditions connected to each main precondition, as per the TOC in appendix A. This report presents only preliminary qualitative and quantitative data; a secondary analysis will be done in the future, and the results shared with partners in Ethiopia.

***Figure 2**: The Main Country Level Objective and Five Main Preconditions*




## 3.1. MAIN COUNTRY LEVEL OBJECTIVE: HEWs have usable and quality medicines available when needed for appropriate treatment of common childhood illnesses

A list of 14 tracer products (Box 1) was identified from the full list of products managed by HEWs by FMOH and ICCM partners for the survey. The products included all key products for treating the common childhood illnesses, malaria, pneumonia, diarrhea, malnutrition and some representative family planning products.

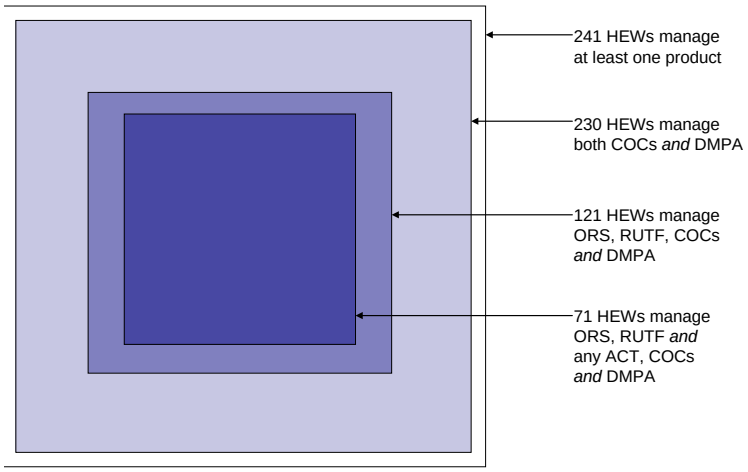
Upon commencing the survey, the HEWs where asked which products on the list of 14 tracer commodities they currently manage. The number of HEWs managing each product varied significantly among products. This was not that surprising for some products like cotrimoxazole 120mg and Zinc 20mg. The training for HEWs to manage pneumonia in the community had not yet been rolled out therefore cotrimoxazole 120mg was not expected. A similar situation occurred with zinc 20mg, which had not yet been rolled out for the treatment of diarrhea. Regarding antimalarials, data predictably showed a mixed picture since malaria is not endemic across the whole country, so not all health posts provide them. It is expected that only 57% and 58% of HPs reported that they have managed Coartem 1X6 tablets and 2X6 tablets, respectively. For other products, the number of HEWs managing them was surprisingly low; for example, only 85% of health posts manage ORS sachets—an essential product for preventing deaths due to diarrhea.

The following diagram (Figure 3) describes the sample based on products managed by health posts, in three categories of products: family planning products (DMPA, COC), child health products (RUTF, ORS) without antimalarials and child health products with antimalarials (RUTF, COC, any strength of ACTs).

**Box 1: Tracer Products for Assessment**

1. cotrimoxazole 120mg tablets
2. cotrimoxazole 240mg/5ml suspension (bottle)
3. amoxicillin 250mg capsules
4. amoxicillin 125mg/5ml suspension (bottles)
5. Coartem (lumefantrine / artemether) 1 x 6 tablets (ACT)
6. Coartem (lumefantrine / artemether) 2 x 6 tablets (ACT)
7. chloroquine 50mg/5ml syrup (bottles)
8. malaria RDTs
9. zinc 20 mg tablets
10. ORS sachets or Oral Rehydration Salts
11. Ready to Use Therapeutic Food - Plumpynut sachets (RUTF)
12. male condoms
13. depot-medroxy progesterone acetate (Depo-Provera or Petogen) vials (DMPA)
14. combined oral contraceptives (COC)

***Figure 3*: *Number of HEWs who manage each category of health products: family planning products, child health products without antimalarials and child health products with antimalarials***

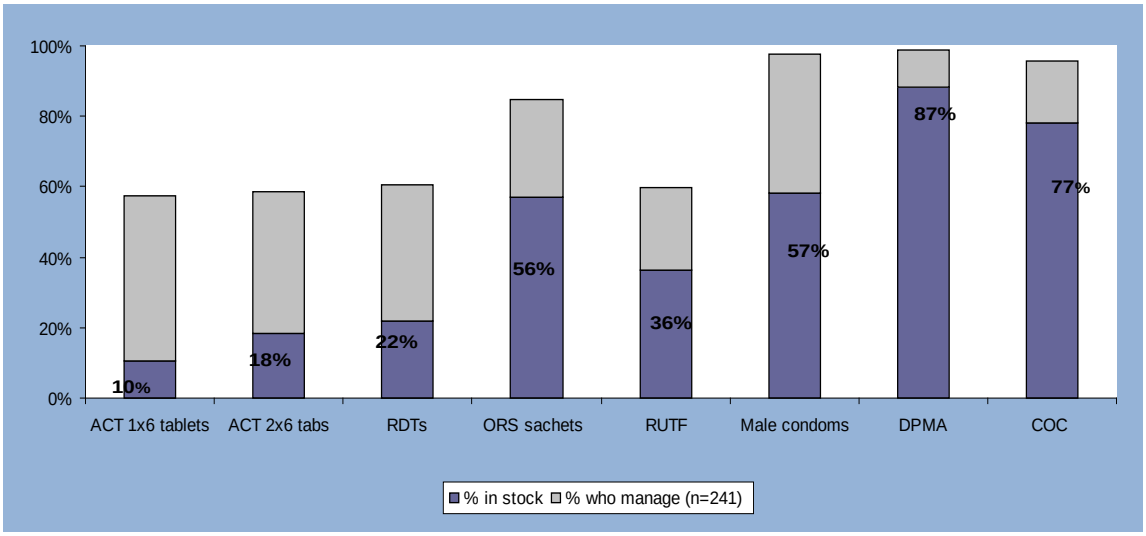



Nearly all HEWs surveyed manage tracer family planning products (DMPA, COC), whereas a smaller percentage of HEWs manage ORS, RUTF and an even smaller number reported managing Coartem.

Physical inventory was conducted by the data collectors for all 14 products to assess the number of health posts with products on the

day of visit. The survey observed high levels of product availability (in stock rates) of family planning products, such as DMPA and COCs at health posts; however, product availability was much lower for products like malaria RDTs, Coartem, ORS and RUTF. (Figure 4) Despite the fact that availability of some products may be impacted by seasons, a health post should never have a stock out of any of these essential products. It should be noted that data was collected only for two packages of Coartem, 1x6 and 2x6 tabs, as the project is primarily concerned with products for child health and promotes the use and availability of child friendly pack size at all times. However, it must be acknowledged that in many cases children will be treated with the adult packages of 3X6 or 4X6 by cutting the packages as the strengths are the same. So this assessment revealed that stock levels of child friendly ACTs (1X6 and 2X6) were low at the time of the survey while children may still have been treated with ACT 3X6 or 4X6.

***Figure 4*****:** *Percentage of HEWs who manage and were in stock on day of visit*




In assessing product availability by the product categories mentioned above (family planning, and child health with/without ACTS) we can see that there are trends associated with the categories which could be related to the level of program or donor support. Product availability of family planning products, as seen at the HP level, is noticeably higher at the HPs than other products. When the product availability is compounded by the categories it is apparent that as child health products with or without antimalarials are added the number of health posts with all products in stock drops dramatically.

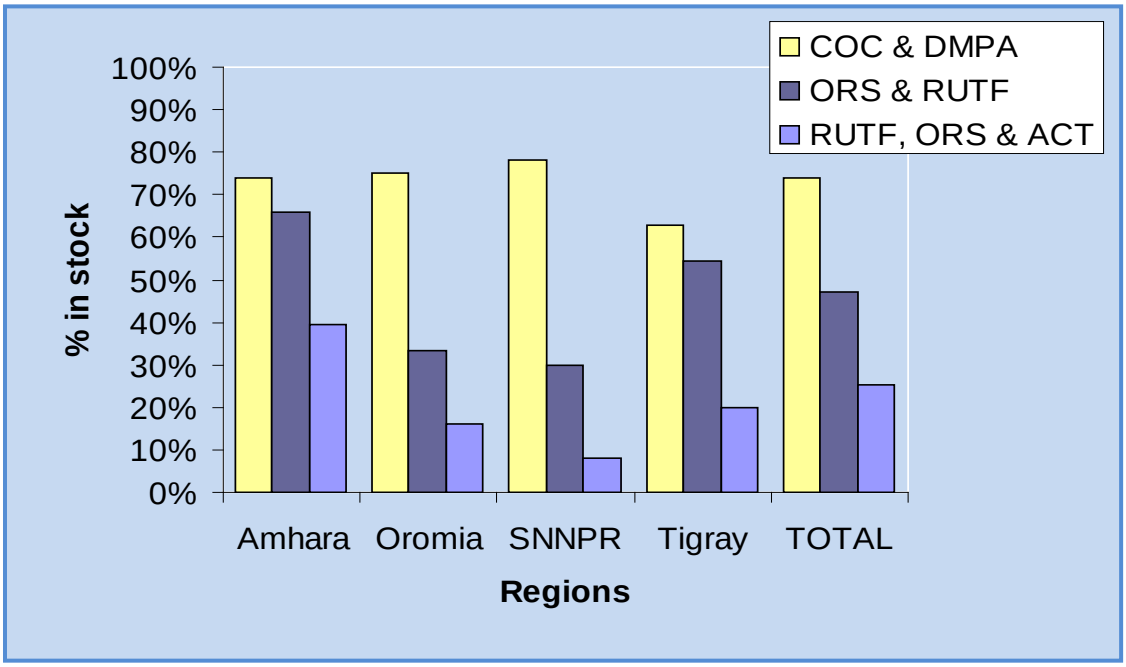
**Box 2: Product availability by Product Category**

- 171 of 230 **(74%)** HPs manage both COCs *and* DMPA and have **all in stock**
- 49 of 121 **(41%)** HPs manage ORS, RUTF, COCs *and* DMPA and have **all in stock**
- 14 of 71 **(20%)** HPs with ORS, RUTF, COCs, DMPA and any ACT have them **all in stock**

On viewing this product availability data by region, the same pattern is seen that family products are better supplied than other health products assessed Figure 5**.** Family planning appears to be a

better established system as the products are better supplied, whereas Coartem is a limiting factor for availability of all 3 products at HEW level in all regions.

***Figure 5:*** *Regional Variations of in Stock Rates at HP Level*




The majority of HEWs (74%) reported they had experienced stock outs in the last 12 months. On enquiring as to the reasons for the stock outs, 53% of HEWs reported "the resupply point doesn't give me enough health products" and 26% reported that "more people are coming to health posts." (Table 2) When asked how they respond to a stock out, the majority of HEWs said they go to either the HC (57%) or WoHO (39%) for emergency supply. A smaller number of HEWs said they wait until the next resupply schedule (7.4%), refer their clients to local drug sellers (5.1%) or other health institutions (10%).

***Table 2:*** *Reasons for stock outs at health post level*

| Reasons | National (n=176) | Tigray (n=20) | Amhara (n=59) | Oromia (n=44) | SNNP (n=53) |
|---|---|---|---|---|---|
| Did not receive all the health products ordered | 40% | 15% | 47% | 34% | 47% |
| The resupply point does not give me enough health product | 53% | 45% | 86% | 50% | 21% |
| Resupply did not have any product | 24% | 45% | 15% | 52% | 4% |
| More people are coming to the HP | 26% | 25% | 8% | 23% | 47% |
| Health products expired | 1% | 0% | 0% | 0% | 2% |
| Other | 5% | 0% | 3% | 9% | 6% |

*Multiple responses allowed

## 3.2. PRECONDITION 1: Necessary, usable, quality CCM products are available at HEW resupply point(s)

It is expected that for products to be available at the lowest level of the supply chain, products must also be available at the higher levels of the supply chain. Resupply points for health posts in this assessment are health centers and/or woreda health offices.

Figure 6 graphically represents the decreasing trend in availability of products when one goes down along the health system structure, with better availability of most products at higher levels of the system and overall product availability generally lower at the health post level, though this varies by product.

By comparing aggregated stock rates at resupply points with HPs, product availability at the resupply points appears to be strongly linked to the availability at health post level. (Figure 7) In general, whenever the resupply points had stock of products the likelihood of having products at HP level appears to be better. The information in Figure 7 has been disaggregated by region in Appendix B, and shows that the strength of this link varies by region and product.

***Figure 6:*** *Product availability at various levels of the health system at day of visit*

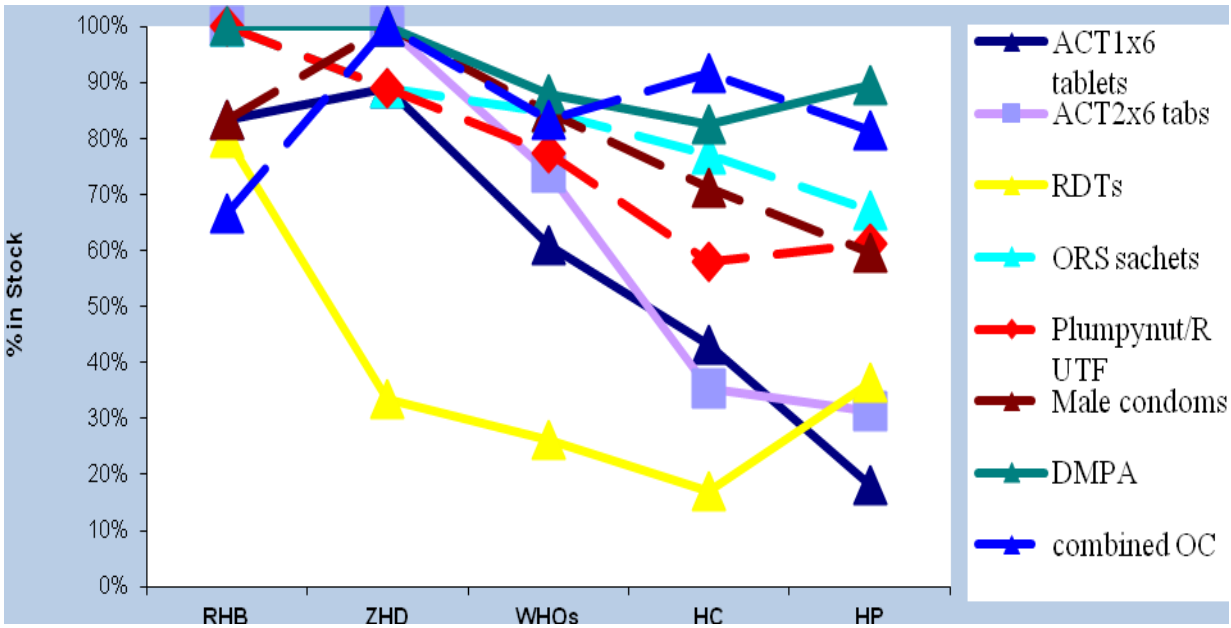
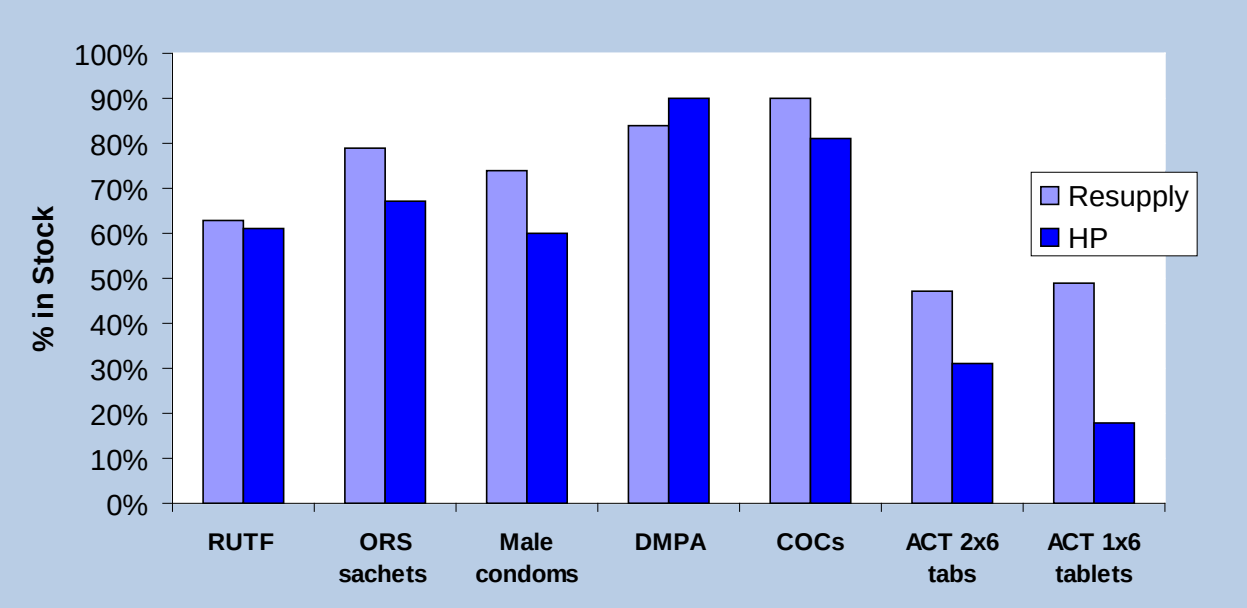


***Figure 7**: Product availability at HP and resupply points*




The majority of resupply points (77% of Woreda Health Office and 86.5% of Health Centers) experienced stock outs in the last 12 months prior to data collection. The reason mentioned by the majority at each level (75% of WoHOs and 56% of HCs) was "the resupply point does not give me enough health products."

## 3.3. PRECONDITION 2: HEWs, or person responsible for HEW resupply, know how, where, what, when and how much of each product to requisition or resupply and act as needed

Precondition 2 recognizes the importance of knowledge and capacity of health workers for the system to function efficiently. HEWs, as well as health workers at facilities that resupply HEWs, need to understand the procedures for supplying health products to the HEW. To assess the strength of this precondition, the survey asked respondents throughout the supply chain about the types of training they received, the availability of standard operating procedures and reporting forms and any general procedures they followed concerning stock management and reporting of logistics data.

### *a) Training*

Respondents were asked whether they had received training on supply chain management and HEWs were also asked about their training in treatment of common childhood illnesses. The number of staff trained in supply chain management varied across the regions and levels of the system. (Table 3)

***Table 3:** Percentage of health workers WoHO reported receiving formal SCM training by region*

| Level | **Amhara** | **SNNP** | **Oromia** | **Tigray** | **National** |
|---|---|---|---|---|---|
| **WoHO** | 10% | 50% | 43% | 33% | 31% |
| **HC** | 3% | 6% | 17% | 11% | 8% |

| | | | | | |
|---|---|---|---|---|---|
| **HEW (HP)** | 9% | 13% | 5% | 30% | 11% |

When asked to specify the topics covered in the supply chain management (SCM) trainings, transportation of products appears to have been given least emphasis at all levels. (Table 4) 38% and 67% of staff at WoHO and HC levels received training in the last two years, respectively, and 42% of HEWs who reported receiving training did so within the past year.

In addition to formal training, the HEWs reported being taught how to complete forms through informal methods or through teaching themselves. Of the 99 HEWs who report using forms, 39% reported learning through on the job training, 7% learned at a workshop and almost half (46%) reported they figured it out themselves, which may explain some lower quality of information provided.

***Table 4:*** *Reported Areas of Supply Chain Management Trainings*

| SCM Training Topics | Woreda health office (n=8) | Health Center (n=6) | Health post (n=27) |
|---|---|---|---|
| Record keeping | 63% | 83% | 52% |
| Ordering | 75% | 83% | 41% |
| Receiving | 75% | 67% | 33% |
| Storage | 88% | 67% | 44% |
| First to expire, first out or FEFO | 88% | 67% | 48% |
| Transportation | 13% | 0% | 11% |
| Reporting | 75% | 67% | 44% |

*Multiple responses allowed

HEWs were asked whether they attended trainings on treatment of major childhood illnesses. Slightly more than half (56%) reported being trained on how to treat malnutrition and 44% on providing family planning. As expected, only 16% and 18% of HEWs reported attending integrated refresher training and pneumonia treatment respectively, since the protocol to allow HEWs to treat pneumonia in the community is a new initiative in Ethiopia that is just rolling out. (Table 5)

***Table 5:*** *Percentage of HEWs attended training on how to treat major childhood illnesses*

| Trainings | HEWs (n=244) |
|---|---|
| How to treat pneumonia in children | 18% |
| How to treat diarrhea in children | 30% |

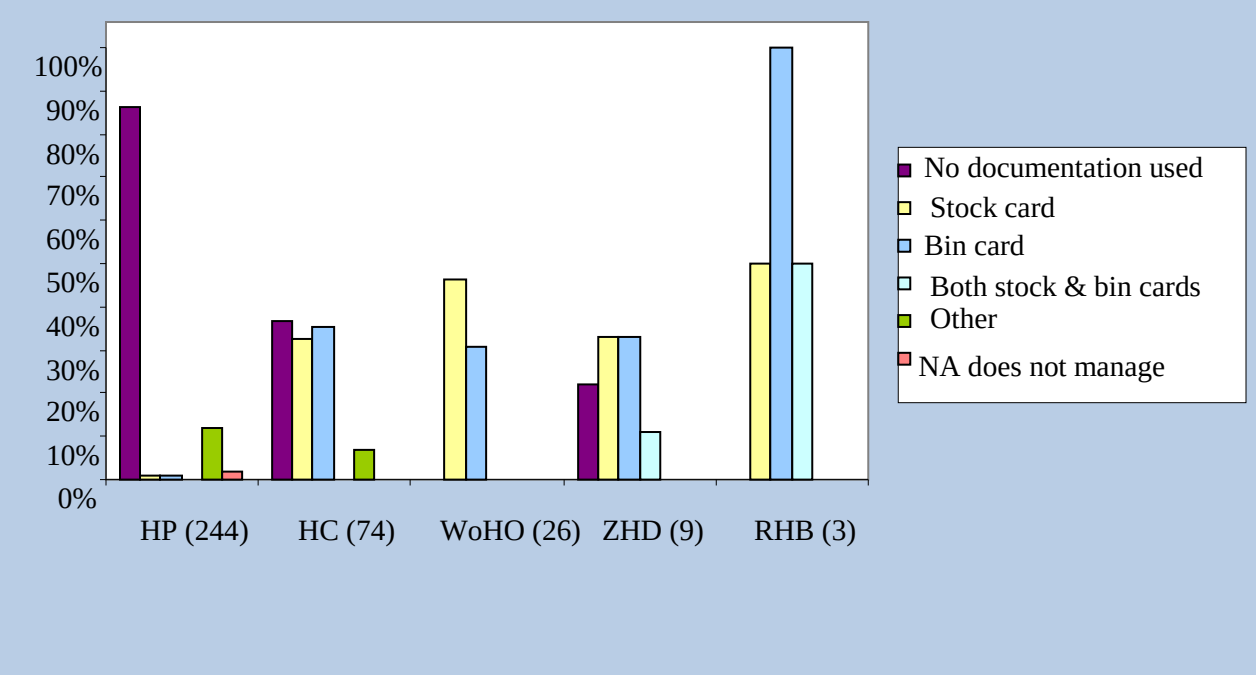
| | |
|---|---|
| How to treat malnutrition in children | 56% |
| How to treat malaria in children | 38% |
| How to provide insecticide treated bed nets for malaria | 21% |
| How to provide family planning services | 44% |
| Integrated refresher training (IRT) | 16% |
| None of the topics listed | 20% |

*Multiple responses allowed

### *b) Record keeping/documentation*

Good record keeping of the movement of stock in and out of a facility is reflective of good basic supply chain practices. In Ethiopia, most of the facilities at the regional, zonal, woreda and health center level reported using some form of stock keeping document, whether a bin card, stock card or both, to record stock transactions. The opposite is true at the health post level where the majority of HEWs (86%) reported using no stock keeping documentation at all. (Figure 8)

***Figure 8:*** *Percentage of facilities that use stock keeping documentation at each level*

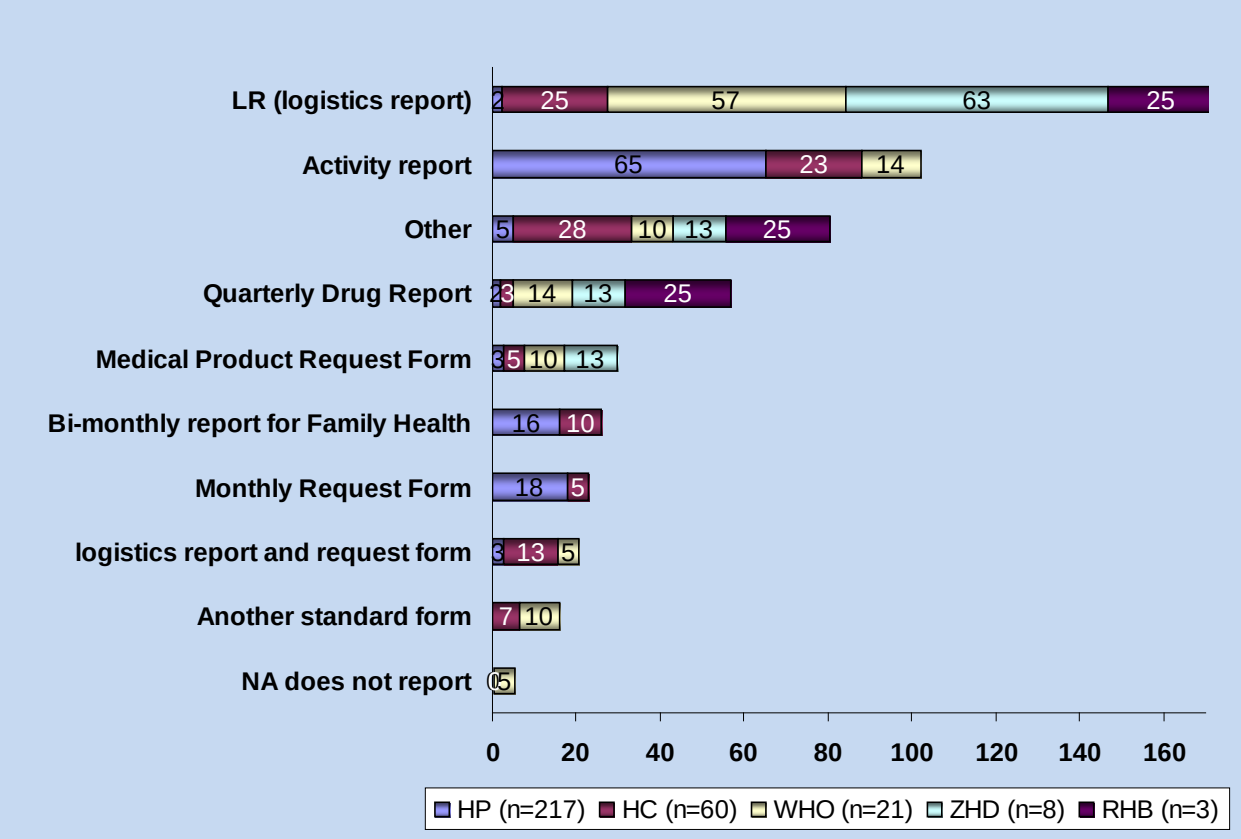



### *c) Reporting Procedures*

Data visibility in a logistics system allows staff at different levels to make informed decisions when planning, forecasting, calculating resupply quantities and performing many other logistics

activities. To achieve desired outcomes, logistics data must be good quality and reports need to be received by the decision-makers in the supply chain. The following bar graph (Figure 9) highlights the variety of reporting forms used in Ethiopia. The most common report used at the zone and woreda levels was the Logistics Report, while at the Health Post level 65% reported using an Activity Report. The Health Center showed a variety of responses, with 25% using the Logistics Report, 23% using an Activity Report and 28% reporting another type of report.

***Figure 9**: Type of reports submitted by various levels*

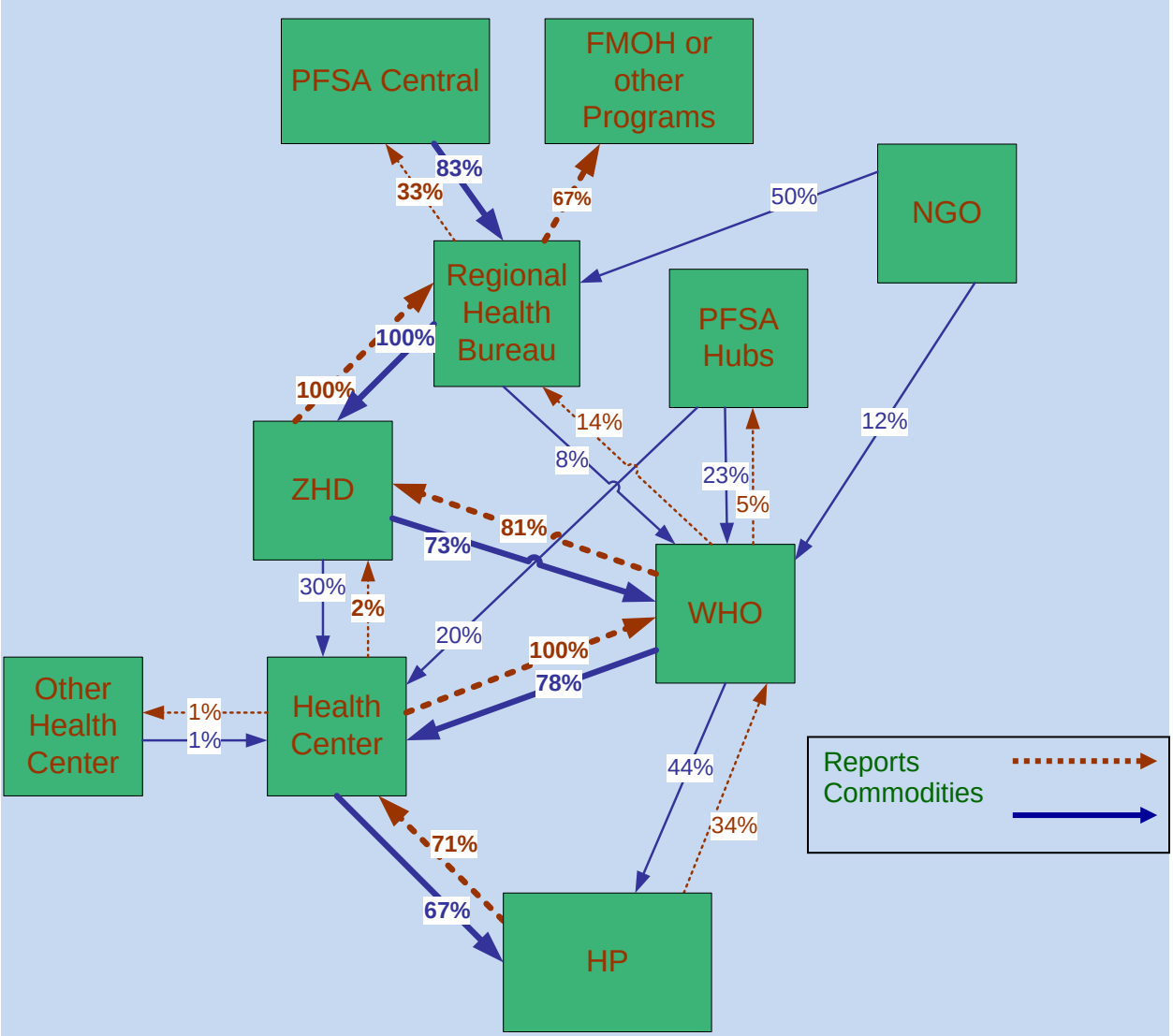



Many of the respondents recognized reports should be sent to the next level; 81% of WoHOs, 89% of Zonal Health Departments (ZHDs) and 100% of Regional Health Bureau (RHB) respondents acknowledged this requirement. The following diagram outlines the reported flow of commodities and the flow of reports in the entire health system. (Figure 10) The diagram is consistent with a system that is in flux as per the Ethiopia system, which is in the process of rolling out the Integrated Pharmaceutical Logistics System (IPLS). The diagram highlights the multiple channels for both commodities and reporting. When considering the flow of commodities and reports by individual health products, such as family planning versus ORS, there were no particular patterns in terms of how particular products or reports move through facilities.

Respondents were able to give multiple responses to where they send reports; hence, one facility may have reported that they send reports to two different institutions in the system. This is

possible to see when considering the HP: 71% report sending information to HCs and 34% of HPs stated they report to the WoHO, therefore indicating that 7% of HPs report to both.

***Figure 10:*** *Flow of commodities and information for tracer products in Ethiopia*




Timeliness of reporting at all levels was another dimension assessed and revealed that 50% of respondents at RHBs, 13% at ZHDs, 30% at WoHOs, 16% at HCs and 13% of HEWs failed to submit a report in a timely manner over the past year. The major reason behind not submitting the report as stated by these HEWs was "having not been supplied with or ran out of reporting forms" (24%) and "not having time to fill the report" (14%). These two reasons also account for 40% of the reasons reported by Health Center staff. Other responses mentioned by HEWs that make up 41% in the 'other' category included being away for trainings, meetings or outreach, or being either too busy or sick to fill the forms. (Table 6)

***Table 6:*** *Reported reasons for submitting reports late*

| Reasons | WoHO (n=7) | HC (n=10) | HP (n=29) |
|---|---|---|---|
| Have not been supplied with or ran out of reporting forms | 14% | 30% | 24% |
| Do not have time to fill out | 0% | 10% | 14% |
| Do not know what they use the information for | 14% | 0% | 3% |
| No transport available | 29% | 40% | 10% |
| Cluster health center or woreda or zone health offices are too far | 0% | 0% | 7% |
| The rainy season | 0% | 10% | 3% |
| No one came to pick it up | 0% | 0% | 3% |
| Others | 43% | 30% | 41% |

Assessing the common problems of completing the reporting forms, the survey showed that a large number of WoHO staff (67%) do not know how to fill the forms. At HC level, 33% of respondents also mentioned people are not well trained on how to complete report forms. In addition, 43% of HEWs reported that they have no pre-printed forms to use. (Table 7)

***Table 7***: Common problems of completing reporting forms

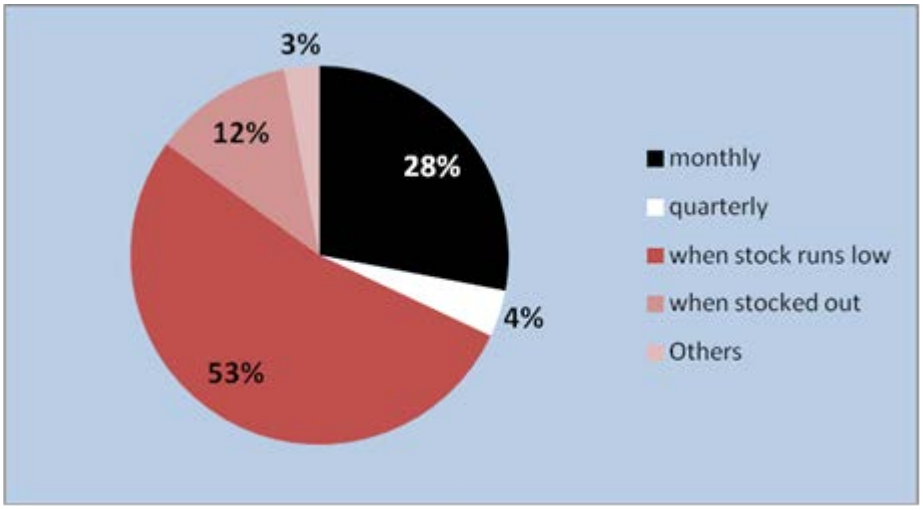
| Problems | WoHO (n=3) | HC (n=6) | HP (n=14) |
|---|---|---|---|
| The forms are too complex | 0% | 17% | 14% |
| Do not understand why I have to | 33% | 17% | 7% |
| Do not understand how to complete the forms | 67% | 17% | 7% |
| Do not have preprinted forms | 33% | 33% | 43% |
| Do not have the necessary information | 33% | 0% | 14% |
| Have not been trained/staff lacks capacity | 0% | 33% | 7% |
| Other | 0% | 0% | 7% |

*Multiple responses allowed

### *d) Resupply Procedures*

As seen in the diagram above (Figure 10) products flow through various channels to get from one level to another. Nationally, 67% of HPs reported getting supplied from the HC and 44% reported being supplied by the WoHO, revealing that some are supplied by both.
In terms of the frequency that facilities request new products and what prompts them to request supplies, only about 28% of reporting HEWs (n=99) reported requesting products on a regular basis and more than 50% of HEWs either submit requests when stock runs low or when they stock out (Figure 11).

***Figure 11**: Frequency HEWs request supplies*




Resupply procedures at higher levels of the system, as reported by survey respondents, are just as inconsistent as those at the HP level. Thirty percent of WoHO respondents underscored they receive re-supplies every month but the same proportion stated the receive products when they need them. An even greater proportion of HCs (46%) said they receive the products whenever they need them, but the majority of zonal level respondents reported being resupplied regularly every two or three months. (Table 8)

***Table 8**: Average frequency of resupply*

| Average frequency of resupplies | ZHD (n=9) | W0HO (n=26) | HC (n=74) |
|---|---|---|---|
| every two weeks | 0% | 0% | 3% |
| every month | 11% | 30% | 20% |
| every two months | 33% | 12% | 5% |
| every quarter | 33% | 23% | 24% |

| Average frequency of resupplies | ZHD (n=9) | W0HO (n=26) | HC (n=74) |
|---|---|---|---|
| whenever I need health products | 22.2% | 30% | 46% |
| less often than every quarter | 0% | 0% | 1% |

Based on the responses regarding who determines resupply quantities at each level there appears to be a mix of push[2] and pull[3] systems in the country. The majority (65%) of HEWs report determining their own resupply quantities (pull), though to a lesser extent they also mentioned resupply HC or WoHO – their resupply point - also taking this role (push). At Health Center level, 39% reported the WoHO in charge calculates their resupply quantity (push) and 32% reported the Health Center in charge calculates resupply quantities (pull). Moreover, half of those interviewed at WoHO level reported that the WoHO officer determines resupply quantities (pull), but another 42% reported that the Zonal Officer plays this role (push).

The methodology used for determining resupply quantities also varied between facilities and levels (Table 9). As such, it is sufficient to say a standard methodology is currently not used in all facilities.

***Table 9:*** *How resupply quantities are determined*

| Methods | WoHO (n=26) | HC (n=74) | HP (n=244) |
|---|---|---|---|
| By formula | 12% | 11% | 7% |
| Whenever the last container is opened | | 1% | 1% |
| Same as last month | 12% | 11% | 13% |
| As much as HEW can carry | | 0% | 2% |
| Based on forms submitted | 23% | 24% | 29% |
| Others decide how much to supply | 23% | 19% | 31% |
| Depends on the product | | 9% | |
| Other | 23% | 38% | 19% |

*Multiple responses allowed

Utilization of standard request forms varies across all facilities in Ethiopia. At the Zonal and Woreda level 80% to 90% of respondents reported using standard request forms, whereas at the HP and HC level the average was around 41% to 57%, respectively. This also varied by region,

[2] Pull system: the personnel who receive the supplies determine the types and quantities of products to be issued or collected

[3] Push system: the personnel who issue the supplies determine the types and quantities of products to be issued or collected.

for example in SNNP no HEWs reported using any kind of standard requisition forms. In questioning staff at all levels on how they learned to complete the request form, 67% of WoHO respondents, 74% of HC respondents and 47% of HEWs reported they figured out how to use the request form themselves, again questioning the accuracy in how request quantities are determined.

Mobile technology capabilities and access were also assessed to learn about the potential for using mhealth tools to improve data transmission. The majority of HEWs (89%) reported owning a mobile phone, however only 38% and 23% of HEWs reported having adequate network coverage and power source to recharge their phone at their place of work, respectively.

### 3.4. PRECONDITION 3: HEWs have adequate storage: correct conditions, security and adequate spaces

Storage is considered a precondition for the main objective in ensuring that medicines maintain their quality and effectiveness so as to be useful in treating sick children when needed.

The ten storage conditions assessed in the survey are highlighted to the right. (Box 3) At the health post only the first eight conditions could be properly assessed, due to the fact that health posts only keep a small quantity of products; as often only one batch was in storage. Thus FEFO (9) could not be assessed. In addition, most health posts did not have any chemicals to allow, separation from chemicals or insecticides (10) was not assessed. Very few health posts met all of the storage conditions. (Table 10)

Box 3: Satisfactory Storage Conditions:

Health products are stored:

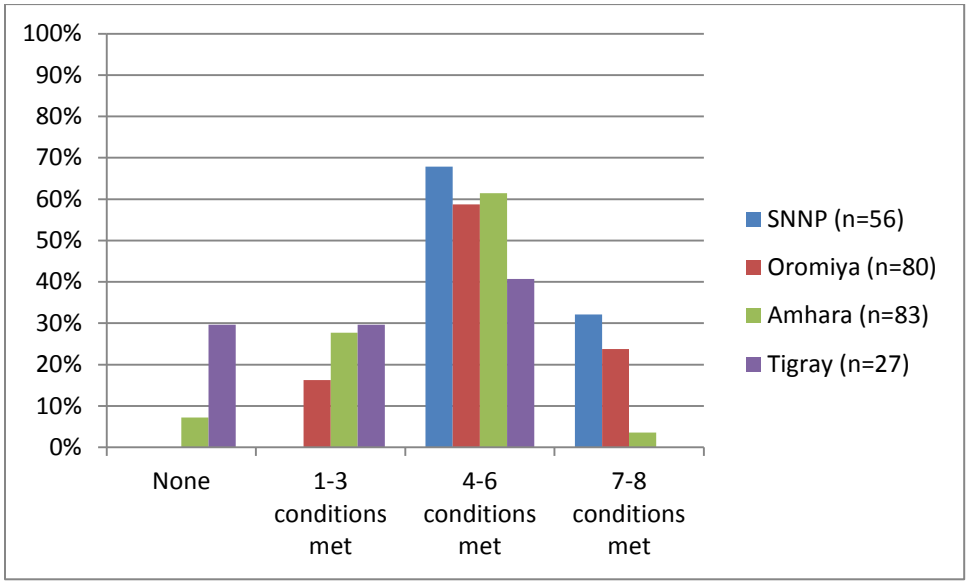
1. separately to damaged and/or expired health products
2. in an area free of rodents or insects
3. securely with a lock and key, and with limited access
4. in an area that is protected from direct sunlight
5. at the appropriate temperature
6. on shelves or stacked off the floor in stacks and away from walls
7. in a clean, dry, well-lit and well-ventilated storeroom
8. In an area that is accessible during all normal working hours.
9. *so that first-to-expire, first-out (FEFO) is observed*
10. *separately to insecticides and chemicals*

***Table 10**: Percentage of Health Posts with products managed that met each Storage Condition*

| Storage condition | HP (n=239) |
|---|---|
| Medicines and supplies stored on shelves or off floor | 32% |
| Medicines/supplies all stored in clean, dry, well ventilated and lit storage | 57% |
| Medicines/supplies protected from direct sunlight | 89% |
| Medicines/supplies stored at appropriate temperature | 70% |
| Storage area free of rodents or insects | 54% |
| Storage area secured with lock and key, and is limited to authorized personnel | 86% |
| Damaged/expired medicines stored separately - damaged or expired products observed in separate area | 19% |
| Damaged/expired medicines stored separately- separate area seen but no damaged materials at time of visit | 37% |
| Storage area is accessible during all working hours | 26% |

The graph below shows the percentage of HPs that met zero conditions, one to three conditions, four to six conditions, or seven to eight conditions so as to classify health posts as having very bad storage, bad storage and good storage to assess the level of intervention required. The condition of storage in health posts differs by regions, as depicted in Figure 12 which shows that problems are more pronounced in Tigray and Amhara regions.

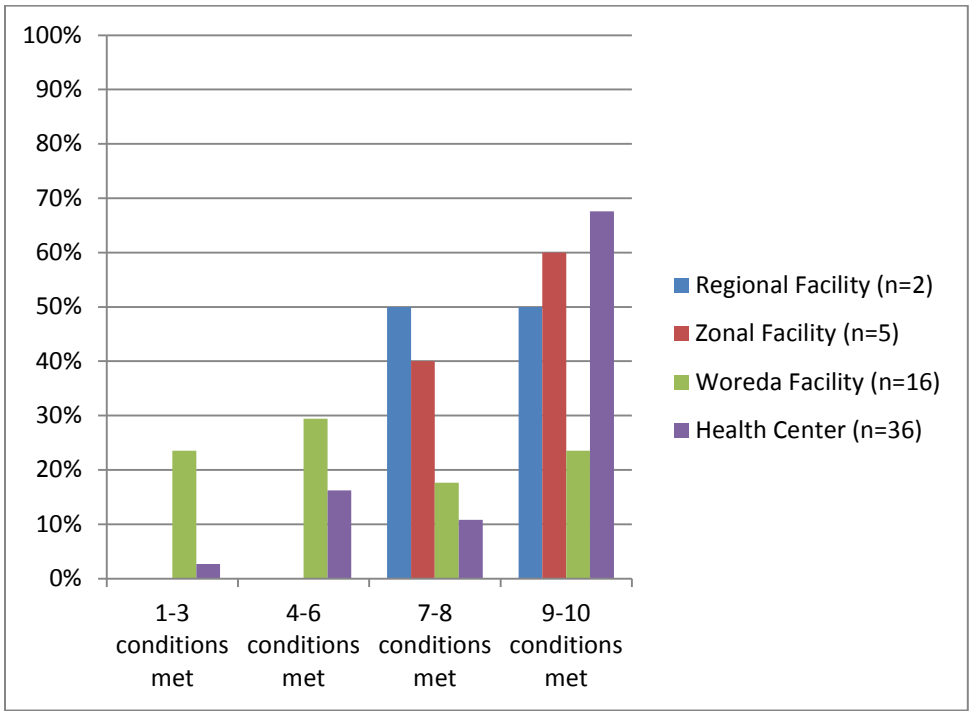
***Figure 12**: HP Storage conditions met among regions*




### *a) Storage at resupply points*

Data collectors also observed storage conditions at the resupply point, as good storage is essential at all levels of the supply chain if product quality is to be maintained. As shown in Figure 13, WoHOs and HCs need the most improvement in maintaining good storage conditions. Almost 25% of WoHOs met only 1-3 conditions, and almost 30% of WoHOs and 17% of HCs met 4-6 conditions. The situation looked better at zonal and regional levels.

***Figure 13:*** *Proportion of facilities meeting storage condition*




*Note: Any facility that could not be assessed for all conditions was dropped

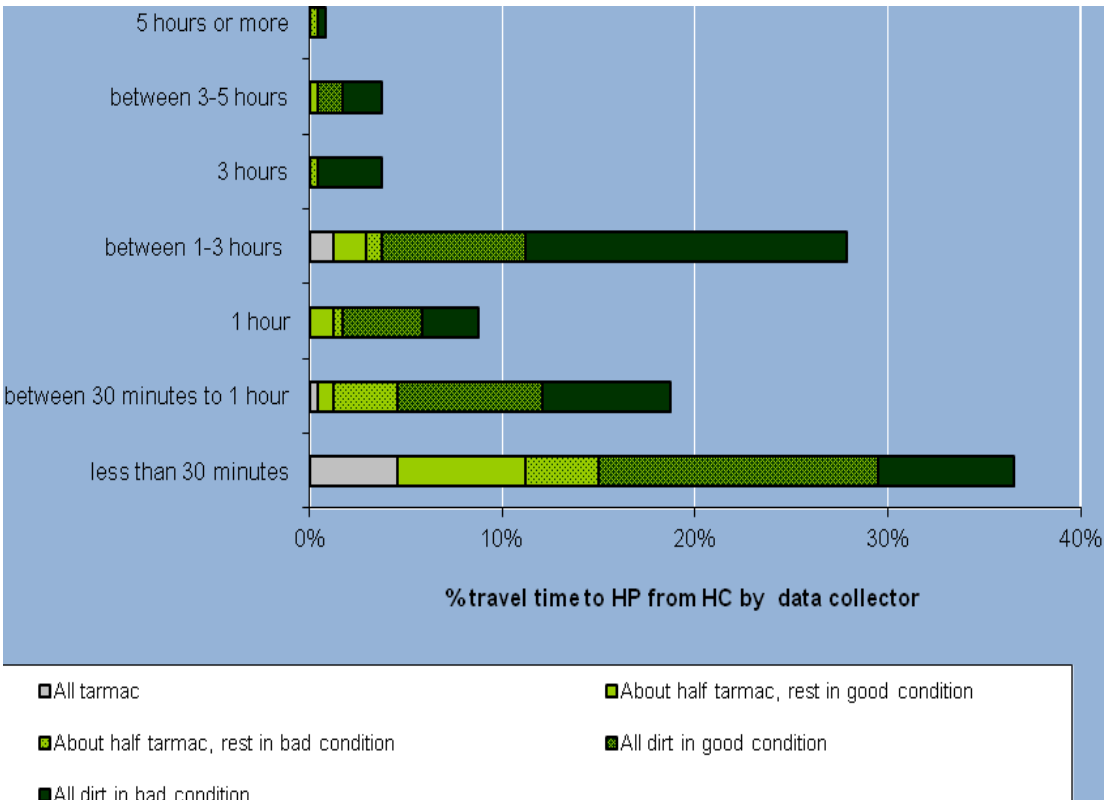
## 3.5. PRECONDITION 4: Goods are routinely transported between resupply points and HEWs

Recognizing reliable transport as one critical aspect of an effective supply chain system, the assessment sought to understand how products are routinely moved from resupply points to health posts. The survey gathered information on the conditions of the roads, the distances that must be traveled and the types of transport used to move products to the community to evaluate the appropriateness and reliability of the modes of transport.

Ninety five percent of HEWs collect their supplies most commonly by walking (69%) and sometimes using public transport (30%) or animal transport (9%) to travel to and from the resupply point. Many used multiple modes of transportation.

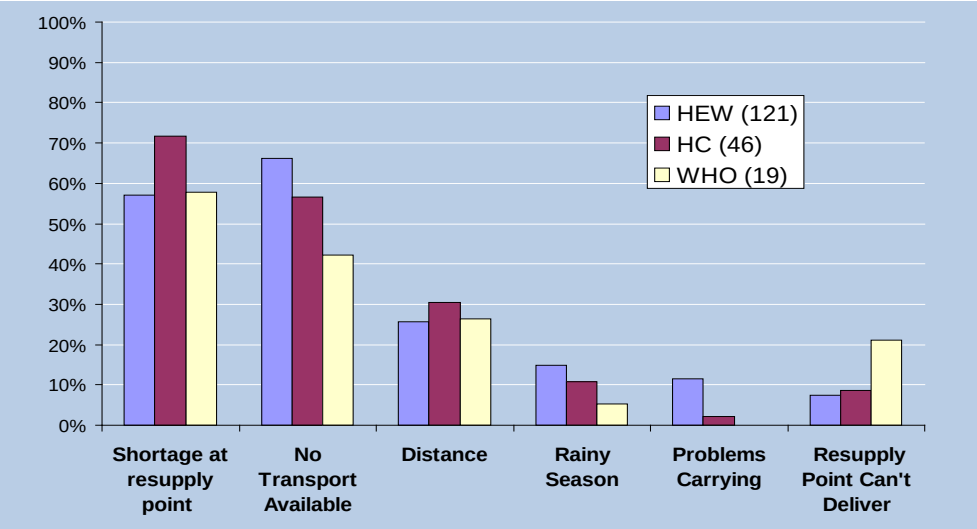
Data collectors were also asked to measure the distance and condition of the road from health posts to health center as time taken to drive to the health post and by noting if the road was tarmac, dirt or both. As shown in figure 14**,** many of the roads were in bad conditions, even when it took the data collectors less than 30 minutes to reach the health post. In such road conditions there are fewer options in terms of public transport and HEWs are forced to walk or use animals to transport their products from resupply points to health posts. Any cost incurred by this cause is covered from HEWs' pocket. Even though the survey took place during the rainy season, which most likely affected conditions of the roads and made them worse, this is an important challenge to consider as HEWs must transport goods in the rainy season as well as the dry season.

***Figure 14:*** *Time between resupply points and HP and road conditions*




Moreover, respondents were asked whether they faced any problems while collecting or receiving products in the last 12 months. Seventy three percent (73%) of WoHO, 62% of HC and 50% of HPs mentioned having any problems. The major problems faced by these facilities (58% of WoHO, 72% of HCs and 58% of HPs) were that their resupply point ran out of health products. (Figure 15)

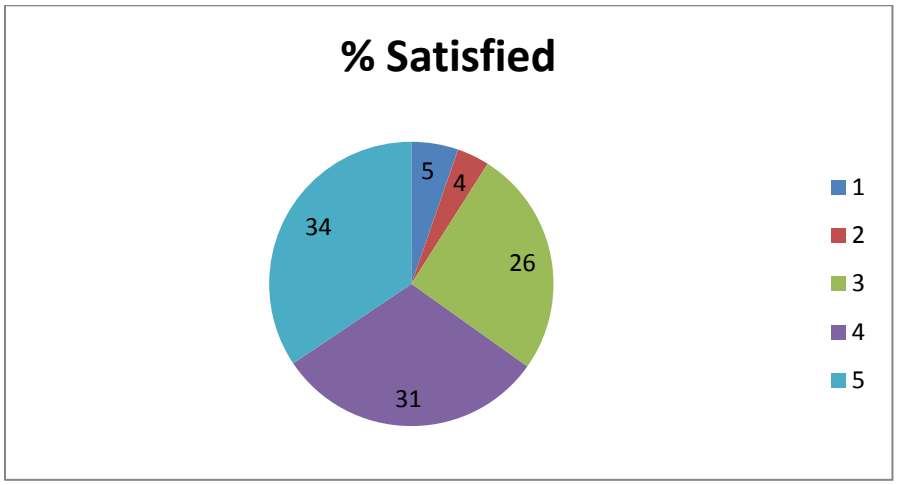
***Figure 15:*** *Problems of collecting or receiving health products*




## 3.6. PRECONDITION 5: HEWs are motivated to perform their roles in the CCM product supply chain

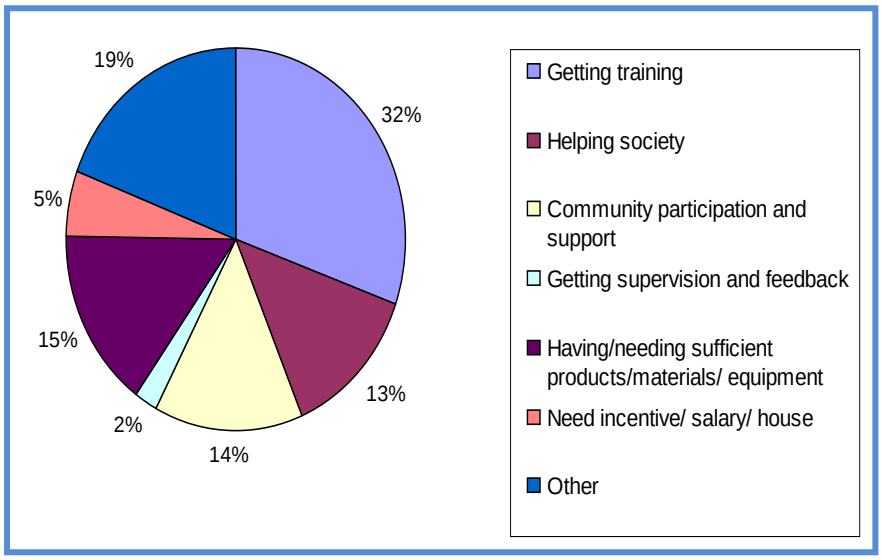
Health Extension Workers were asked to rate their job satisfaction from 1 to 5, with 5 being highest. Despite the data collection method, 10 % of respondents tend to report that they are not satisfied with their job - ranking their job satisfaction as 1 or 2. (Figure 16)

***Figure 16****: HEWs Self-Reported Satisfaction toward their job (1-5 with 5 being highest satisfaction)*




To know what things motivate HEWs to perform well in their job, they were asked to list factors which can motivate them to do better. A majority (32%) of them identified training, (Figure 17), though the length and type of trainings, e.g. formal, informal, classroom or on-the-job are unknown and more investigation may be required to identify exactly which kinds of training were identified as a motivating factor. However, during the validation workshops the HEWs were inclining to career developments and long-term training opportunities that might require further study.

***Figure 17**: HEWs reported sources of motivation*




Even though supervision has been employed by various stakeholders to enhance the motivation of HEWs, only 2% identified supervision as a motivating factor. This survey cannot provide detail on why supervision was not mentioned more often, but it did collect information on some elements of supervisions that might offer some insight.

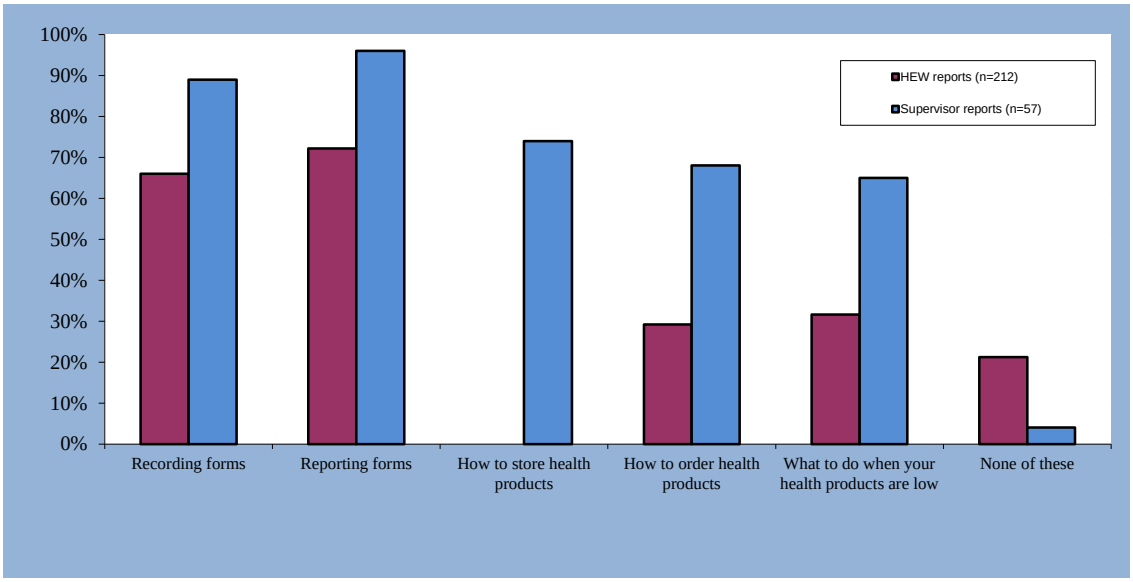
A majority of HEWs reported receiving supervision from supervisors regularly: 84% of HEWs reported receiving supervision once a month or more, and 86% of supervisors reported providing it once a month or more. (Table 11)

***Table 11:** Frequency of supervision*

| Frequency | HEW Reported (n=212) | Supervisor Reported (n=57) |
|---|---|---|
| More frequently than a month | 43% | 70% |
| Every month | 41% | 26% |
| Every quarter | 6% | 4% |
| Every six months | 3% | |
| Other | 4% | |

The majority of HEWs received supervision support from HEW Supervisors (89%) while a smaller number received supervision from Woreda Health Extension Program Focal Persons (22%). The supervision takes place primarily at the health post (98%) and less so at community or village locations (56%). When asked what topics supervision included, the responses from supervisors compared to HEWs differed notably. In most cases the supervisor reported providing supervision on a greater number of topics than the HEW reported. (Figure 18) One very interesting example is that 74% of supervisors reported providing supervision support for HEWs on how to store products, while none of the HEWs reported receiving supervision on this topic.

***Figure 18:*** *Topics reported as being covered during supervision*



# Conclusion and Recommendation

SC4CCM project aims to contribute to the reduction of child mortality by ensuring necessary supplies are available at the health post level. This baseline assessment showed that the availability of ICCM products identified by FMOH and ICCM partners to be available at health posts throughout Ethiopia are not available adequately at this time to have the desired impact on child mortality. This is partly due to the fact that the policy and guidelines for ICCM have only recently been adopted, in particular the guidelines for treating pneumonia. Apart from medicines for pneumonia treatment, products for diarrhea, malaria and malnutrition should be available in sufficient quantities as these have been implemented at the health post level for a number of years. Availability of products varies significantly between product categories; child health products such as ACTs, ORS and RUTF were in much smaller supply than the products for family planning services at the time of the survey. Greater availability of family planning products compared to curative products could be due to a number of factors, such as community demand, donor interest or priorities at the resupply, administrative or FMOH level. Hence, investigating what drives high FP product availability may provide useful lessons for the whole system.

The assessment considered the five major preconditions identified by the project and highlighted some of the strengths and gaps associated with each supply chain area.

***PRECONDITION 1: Necessary, usable, quality CCM products are available at HEW resupply point/s***

The availability of usable supplies at resupply points for many of the tracer products is strongly linked to the availability at the HP level; however in some circumstances there appears to be other factors that influence product availability at the health post. For certain products, such as ACT 1x6 tablets, the in-stock rates at resupply points was far greater than the percentage of HPs with this product in stock. (Figure 5) Further analysis will need to be done to understand the extent to which product availability at resupply points is sufficient enough to refill health posts consistently. Recent initiatives, such as Health Care Financing, may need to be explored in detail to determine if there is a possibility that this mechanism could be utilized to address stock shortages at resupply level and available products to Health posts.

***PRECONDITION 2: HEWs, or person responsible for HEW resupply, know how, where, what, when and how much of each product to requisition or resupply and act as needed***

The country is in a transition to adopt a new IPLS and the baseline assessment reiterated this phase as multiple channels for the movement of products and information up and down the system were reported. In particular, there are multiple resupply options for lower level institutions to receive health products from, and often facilities are not following any kind of reorder schedule but requesting when needed. (Figure 9)

The assessment also revealed that a very limited number of people are trained on Supply Chain Management, particularly at lower levels of the system. Currently there is emphasis on there being a push system to HPs, and therefore it is essential that the resupply point staff have the capacity to accurately calculate resupply quantities.

The lack of standard logistics procedures to guide HEWs in managing their supplies is an important gap preventing improvements in product availability at this level of the system. The

new IPLS does not appear to include the health post level and as such it will be important to complement these efforts to instigate a national system by developing a set of procedures for managing stock that includes reporting and recording formats which address the specific and unique needs of the HEWs. This includes such things as simple forms with few data points and job aids using diagrams and pictures.

Related to this gap, if it is filled, is the need for a training approach that provides basic skills, continuously reinforces skills needed to prevent bottlenecks in product availability and regularly directs attention and resources towards solving chronic supply chain barriers or problems. Similarly, continuous improvement through ongoing capacity building efforts needs to be enforced to ensure people involved in such activities maintain good supply chain practices.

***PRECONDITION 3: HEWs have adequate storage: correct conditions, adequate space and security***

Storage is also one of the major problems identified in this assessment. When health posts were constructed, one room was dedicated for storage. However, some HEWs use this room for living due to necessity. As a result the equipment and supplies available in the health posts is congested in the remaining two rooms. The unavailability of shelves was observed at about one-third of health posts. This issue could be solved through engagement with the community or kebele administration, for which there are many good experiences elsewhere, to construct a room or provide a room near to the health post for the HEW to live in. In addition, as raw materials for constructing locally-made shelves are readily available, it is possible to mobilize the community members towards this end. Availing User Guides on how to store products at health post level is a timely action considering the number of products managed by HEWs is increasing.

The study identified problems related to storage conditions at HP and resupply points. Partners should focus on making sure the supplies at these points are maintained in good quality.

***PRECONDITION 4: Goods are routinely transported between resupply points and HEWs***

Transportation of supplies from resupply points to health posts is a very critical issue. In line with the goals of the Health Extension Program of reaching communities in remote areas reaching health posts is not an easy task. In many instances, the road conditions are not favorable, and health extension workers are forced to walk long distances. When the program started, they were involved only in simple preventive health activities, but now the government has extended their mandate and role so that HEWs can provide simple curative services to manage cases in the community. As a result, the number of products they manage has expanded. If implementation continues in the same trend, we are creating a huge task for HEWs to transport big volumes of bulky and potentially heavy products to their HP. Expecting them to continue working with the same level of motivation and commitment as before will be difficult, and HEWs are likely to leave products behind at the resupply point prioritizing the products that the community asks for or which is easy to carry. Identifying mechanisms to reduce the transportation burden between the resupply points and HPs is much needed. Introducing local solutions to transportion and revisiting the inventory control system to explore ways that reduce the monthly volumes HEWs are required to carry may reduce this burden.

***PRECONDITION 5: HEWs are motivated to perform their roles in the CCM product supply chain***

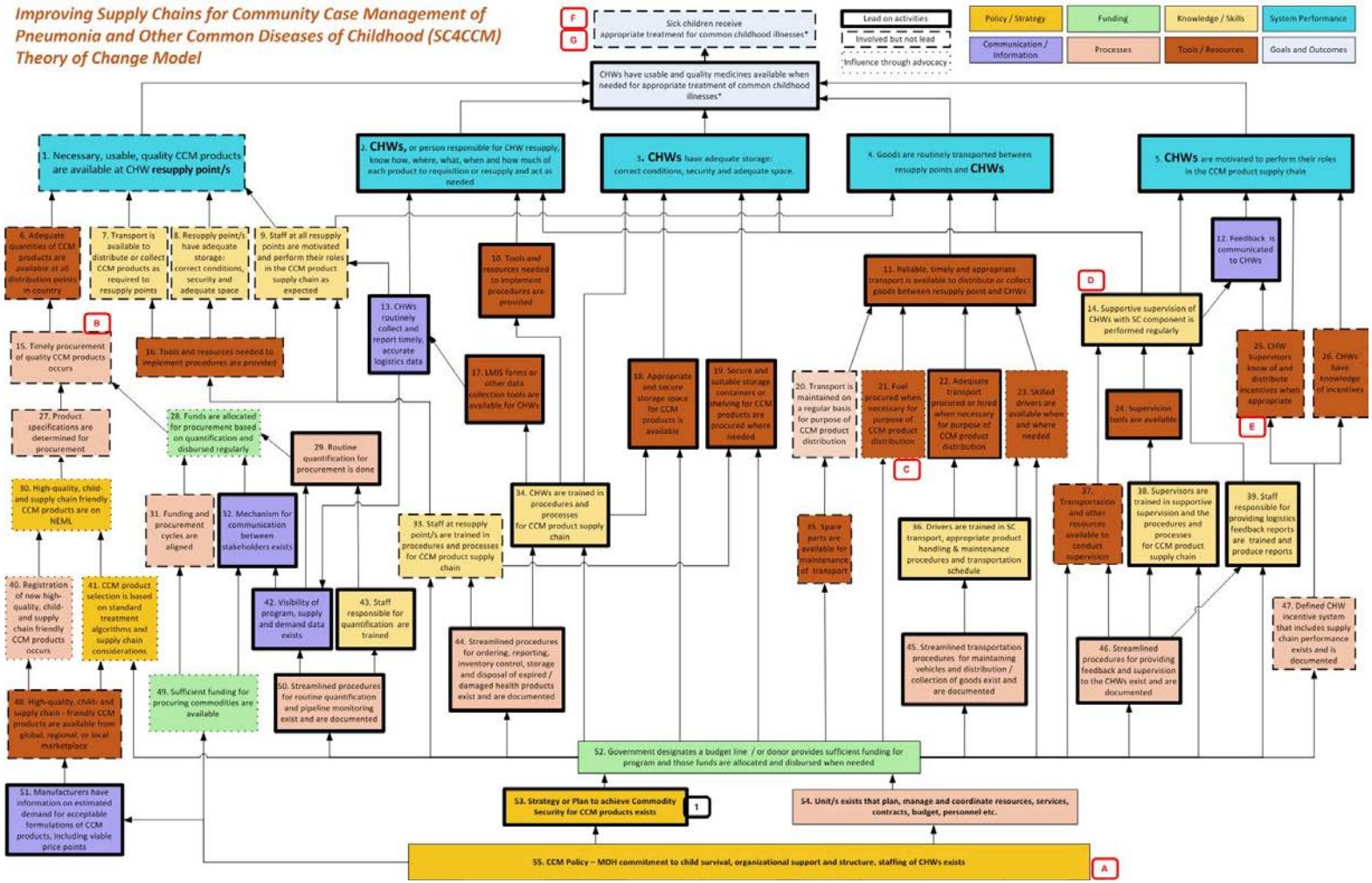
Unless the HEWs are motivated to work, investing in the aforementioned issues would be a futile exercise. The majority of HEWs identified trainings, availability of health products, helping

community and receiving support from community as motivation factors. Any interventions or initiatives at this level ought to gear towards nurturing such practices. Unexpectedly, supervision was not identified as a big source of motivation and this should be explored further as to why and to inform how to address this to make supervision more effective.

In summary, the preliminary data from this baseline assessment has identified a number of gaps that are possibly hindering the availability of usable products at health post level. Recognizing the theme that CCM is new to the sector, it is crucial to test various kinds of interventions to alleviate the problems of product availability at the community level. SC4CCM is exploring possible interventions to test that address the unique challenges faced by HEWs and the project will produce a separate concept note that outlines an intervention strategy that has a long term vision of providing sustainable and affordable solutions for the integrated supply chain that delivers CCM and other products to HEWs to ensure lifesaving products are available when needed for people in the community.

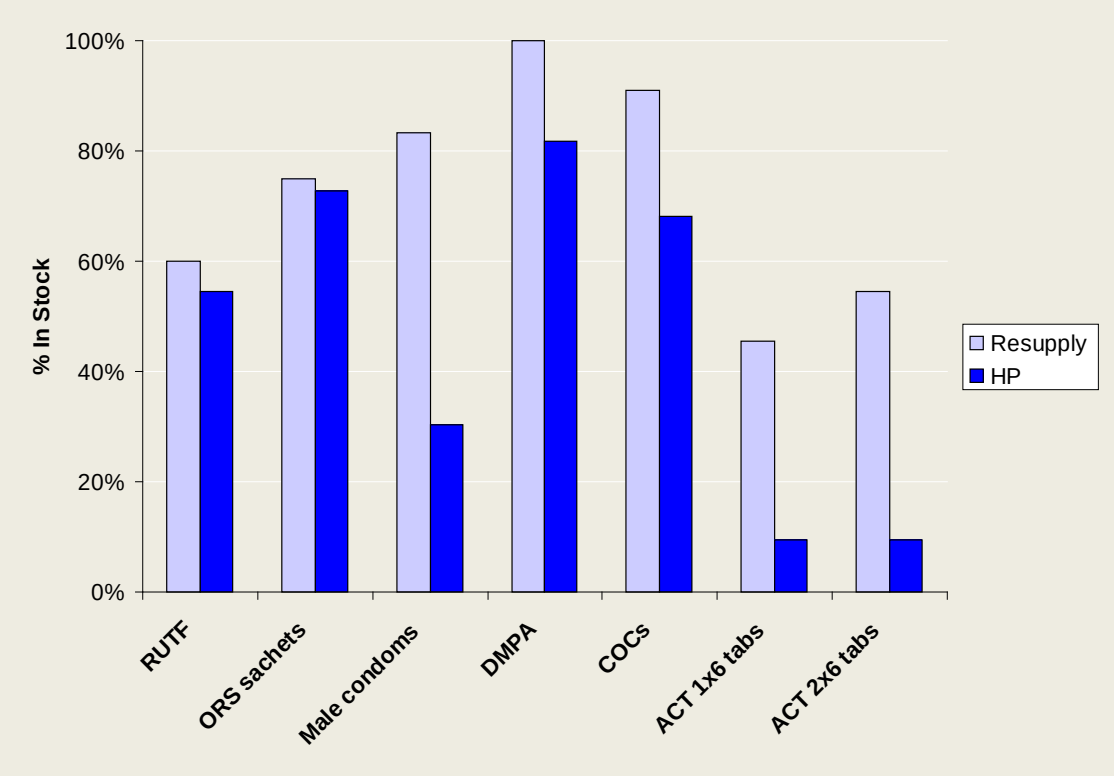
# Appendix A: Theory of Change Diagram

In the diagram CHW = HEW in Ethiopia

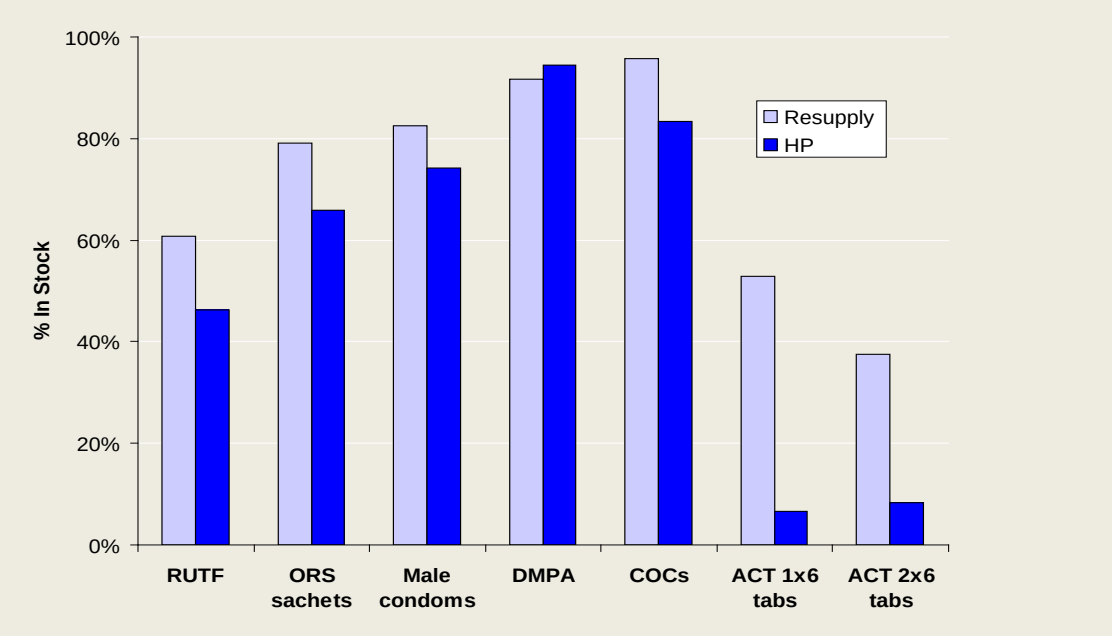


# Appendix B: Product Availability at Resupply Points and HEWs on Day of Visit by Region

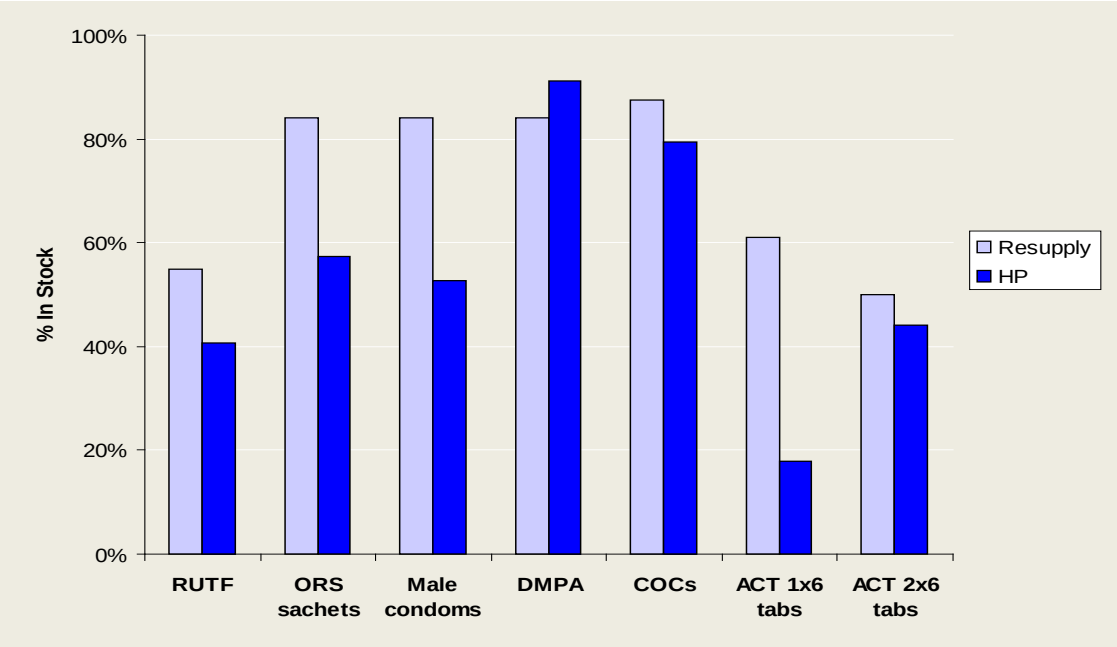
**Tigray**



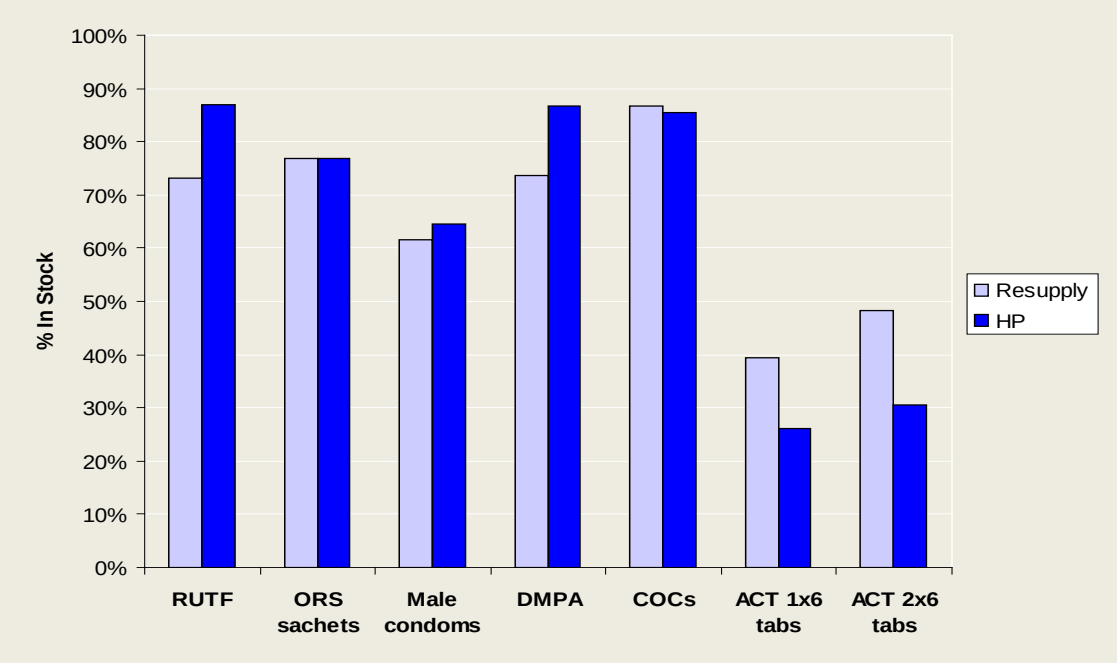

**SNNP**



**Oromia**




**Amhara**



# References

[1] World Health Organization, and Black, et al. 2004. *Causes of Death in Neonates and Children under Five in the Africa Region. World Health Organization*. http://www.who.int/child_adolescent_health/media/causes_death_u5_neonates_afro_2004.pdf (accessed August 18, 2009).

[2] Teller, Charles and Soumya Alva. *Reducing Child Malnutrition in Sub-Saharan Africa: Study Finds Mixed Progress*. Population Reference Bureau. http://www.prb.org/articles/2008/stuntingssa.aspx (accessed August 18, 2009).

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