በኢትዮጵያ ፌዴራላዊ ዴሞክራሲያዊ ሪፐብሊክ
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
የመድኃኒት ፈንድና አቅርቦት ኤጀንሲ
PHARMACEUTICALS FUND AND SUPPLY AGENCY

National Quantification Exercises Report for

Integrated Community Case Management of Common Childhood Illnesses (ICCM) in Ethiopia, Products Requirements for 2012 to 2014

December 2011
Addis Ababa, Ethiopia

Table of Contents

Contents page

Tables and figures:

Annexes:

Acknowledgements

The Pharmaceuticals Fund and Supply Agency (PFSA) would like to express its appreciation and gratitude to all who contributed and participated in the National Quantification Exercise for Integrated Community Case Management Common childhood illness (ICCM), the first of its kind for their contributions and cooperation.

We would like to specifically acknowledge the contributions of the following institutions: - the Federal Ministry of Health (FMOH), Oromia National Regional State Health Bureau, Amhara National Regional State Health Bureau, Southern Nations, Nationalities and People National Regional State Health Bureau, Tigray National Regional State Health Bureau, Benishangul Gumuz National Regional State Health Bureau, Supply Chain for Community Case Management of Pneumonia and other Childhood Illness (JSI/SC4CCM) Project, United Nations International Children's Emergency Fund (UNICEF), Last Ten Kilometers (L10K), Integrated Family Health Program (IFHP), Save the Children-USA, Save the Children-UK, International Rescue Committee (IRC), USAID|DELIVER PROJECT, Supply Chain Management System (SCMS), Management Sciences for Health Strengthening Pharmaceutical Services (MSH/SPS), USAID/TB-Care I, Help Ethiopia Addresses Low Performance TB (HEALTB) Project, among others.

PFSA would also like to acknowledge the special contributions of Alexis Heaton (Technical Advisor, JSI/SC4CCM), Dessalegn Tesfaye (Resident Logistics Advisor, JSI/SC4CCM), Yared Yigezu (Director, Forecasting and Capacity Building Directorate, PFSA), Lilia Gerberg (Technical Advisor, JSI), Bekele Ashagire (Forecasting and Capacity Building Officer, PFSA), Gadissa Homa (Oromia Regional Community Health Technical Advisor, JSI/SC4CCM), Dawit Getachew (SNNPR & Tigray Regional Community Health Technical Advisor, JSI/SC4CCM), Alem Tewelde (Manager, Adama Branch, PFSA), Anteneh Tsige (Senior Pharmaceutical Management Associate, FMOH/MSH/SPS), Abdurahman Abdo (UNICEF Logistics Officer), Saul Morris (Senior Program Officer, Child Health Family Health Division of the Bill & Melinda Gates Foundation).

Acronyms

ACT	Artemisinin based combination therapy
ANC	Antenatal care
ARI	Acute respiratory infection
CCM	Community-based case management
CHW	Community health worker
C-MNCH	Community-based maternal, newborn and child health
DPT	Diptheria, pertussis, tetanus vaccine
EDHS	Ethiopian demographic and health survey
EFY	Ethiopian fiscal year
ENA	Emergency nutrition actions
EPI	Expanded program on immunization
FHD	Family Health Department
FMOH	Federal Ministry of Health
FP	Family Planning
HC	Health center
HEP	Health extension program
HEW	Health extension worker
HF	Health facility
HIB	Hemophilus influenzae type B (vaccine)
HIV/AIDS	Human immunodeficiency virus/ acquired immunodeficiency syndrome
HMIS	Health management information system
HP	Health post
HSDP	Health Sector Development Program
ICCM	Integrated Community Case Management of Common Childhood Illnesses
IFHP	Integrated Family Health Program
IMCI	Integrated management of childhood illnesses
IMNCI	Integrated management of neonatal and childhood illnesses
IRC	International rescue committee
IRS	Indoor residual spraying
ITN	Insecticide treated nets
IYCF	Infant and young child feeding
JSI	John Snow, Inc
L10K	Last Ten Kilometers
LLINs	Long lasting insecticide treated nets
LMIS	Logistics management information system
MSH/SPS	Management Sciences for Health/ Strengthening Pharmaceutical Systems
MDG	Millennium development goal
MOH	Ministry of Health
MUAC	Mid-upper arm circumference
NGO	Non-governmental organization
NTD	Neglected and tropical diseases
ORS	Oral rehydration solution
ORT	Oral rehydration therapy

OTP	Outpatient therapeutic programme
PFSA	Pharmaceuticals Fund and Supply Agency
PMI	President’s Malaria Initiative
PMTCT	Prevention of Mother to Child Transmission
RUTF	Ready to Use Therapeutic Food
RDT	Rapid diagnostic test
RHB	Regional Health Bureau
SC	Save the Children
SC4CCM	Supply Chains for Community Case Management
SCMS	Supply Chain Management System
SFP	Supplementary feeding programs
SNNPR	Southern Nations, Nationalities, and People's Region
TFP	Therapeutic feeding programs
TOT	Training of trainers
TT	Tetanus toxoid vaccine
TTC	Tetracycline ointment (eye ointment)
TWG	Technical working group
U<1	Children under one year of age
U<5	Children under five years of age
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations International Children's Emergency Fund
USAID	United State Agency for International Development
WHO	World Health Organization
WorHO	Woreda Health Office
ZHD	Zonal Health Department

Executive Summary

The Integrated Community Case Management of Common Childhood Illnesses (ICCM) program is currently being rolled out to 25,000 health extension workers (HEWs) in five regions of Ethiopia to quickly reduce child morbidity and mortality caused by the most common illnesses of childhood. From February to September 2011 around 10,500 HEWs are trained on ICCM and supplied with a training kit and the training of HEWs is underway and will continue into early 2012. Pharmaceuticals have been procured to provide HEWs with a starter kit to last each health post approximately six months and the kitting is underway. However, beyond that, there had been no national quantification exercise for all of the products required for HEWs to implement the service packages covered in the ICCM training. A full and continuous supply of these products is critical to the program's use and uptake by clients and to achieve the intended health impact. Given that future funding for the products for this program is uncertain, it is crucial to start coordinating and advocating for funding now so that future procurements can be made in a timely way and avoid interruptions in supplies once the starter kit contents are consumed.

Therefore, PFSA determined that the ICCM quantification exercise should be conducted now. The primary objectives of the national quantification exercise workshop were to:

1. Develop a three-year forecast for 17 pharmaceutical products needed for the ICCM Program (2012-2014)

2. Develop a preliminary one-year supply plan for the years 2012 to 2013

In addition to the reasons already mentioned above, the following additional reasons supported the need for a robust quantification exercise:

a) ICCM is a new initiative which may increase overall demand for services and has not been specifically considered in previous quantification exercises

b) New products and dosage forms are included in the ICCM packages and these require new information, consideration, and assumptions

c) A clear understanding of and consensus on the annual program need and supply plan will help prioritize the most critical requirements and define the resources required

d) Clarity on program requirements will facilitate coordination and mobilization of resources by the government, donors and partners to secure sufficient financial resources for the products required

e) ICCM is a logistics intensive initiative, so aligning the program scale up plan to that of the pharmaceuticals requirements is critical to program success.

f) Timely procurement and a reliable supply plan are critical to ensure continuous product availability at all levels, but especially at the health posts, so this requires a timely quantification exercise to ensure there is no lag in supplies for the ICCM program between the starter kits and the continuous resupply process

The ICCM National Quantification Exercise Workshop took place in Adama on October 3 – 5, 2011 and included active participation and input from members of PFSA, FMOH, the Regional Health Bureaus of Amhara, Benishangul Gumuz, Oromia, SNNPR, and Tigray, UNICEF and other NGOs supporting ICCM implementation and supply chain partners in Ethiopia. The workshop was officially opened by Ato Yared Yiegezu, the Director of Forecasting and Capacity Building Directorate at PFSA. The officials briefed participants on the goals, objectives and rationale of the quantification review and highlighted PFSA's support of the ICCM Program and distribution of products to the health centers to ensure consistent resupplies of products to the health posts. PFSA also underlined the importance of the quantification outputs for planning and mobilizing the financial resources to secure the necessary supplies for programs.

PFSA also stressed the importance of a well-functioning logistics management information system for ICCM and data requirements for effective quantification. The officials requested that partners work to strengthen and support data collection for HEWs to improve the use of limited resources and provide information to help procure appropriate products for pediatrics and use at the community level. Further, while the rationale for conducting this first ICCM quantification as a stand-alone exercise was understood, this was done with the goal that as the program matures it will be harmonized with PFSA's national integrated quantification exercise in the future.

The workshop highlighted the opportunities and also the challenges associated with rolling out a new program and particularly, one that needs to reach the lowest level in the supply chain, the health extension workers. Given the novelty of this program, there was limited logistics data available for this quantification, so this first version was based heavily on assumptions developed by the experts' group. While the contents presented herein represent the best estimate of program needs for the next three years, as the program is fully rolled out, the forecast and supply plan should be reviewed frequently and updated as new information becomes available. In support of this, all participants asserted their commitment to a successful implementation of the ICCM program and assurance of improved collection and reporting of data for decision making.

Error! Reference source not found. represents the estimated product costs only for the ICCM program for the years 2012 – 2014, for the 17 products included in this quantification exercise. It should be noted that these costs do include additional costs associated with freight, handling,

insurance, clearance, storage, and distribution that add approximately 17% to the cost of the product itself. However, as these figures do not take into account any additional quantities of products required to fill the pipeline to ensure adequate inventories at all levels of the system within the parameters of PFSA's inventory control system, the figures herein may not reflect the actual costs associated with the procurement and distribution of the products for the ICCM program. The full costs will be included in the preliminary supply plan which will be developed upon approval of this forecast.

As the recent national integrated quantification exercise in 2010 already quantified for the malaria products, including those intended for use and distribution by HEWs, the figures here are shown with and without those costs.

Table 1 - Estimated Costs of ICCM Products for 2012 – 2014, including 17% for CIF and distribution

Drug Name	2012 Estimated Cost (including 17% CIF and distribution)	2013 Estimated Cost (including 17% CIF and distribution)	2014 Estimated Cost (including 17% CIF and distribution)
Cotrimoxazole 120 mg dispersible tablets	$346,872	$354,889	$363,096
Paracetamol 100 mg tablets	$153,937	$154,175	$154,332
Zinc 20 mg dispersible scored tablets	$6,151,184	$6,307,077	$6,467,030
Low osmolarity 1 L sachets	$5,802,918	$5,949,985	$6,100,882
RUTF sachets	$5,644,905	$5,787,967	$5,934,755
Amoxicillin 125 mg/5ml suspension 100 ml bottle	$15,640	$16,037	$16,443
Amoxicillin 250 mg dispersible tablets	$92,023	$94,356	$96,748
Albendazole 400 mg tablets	$48,729	$49,964	$51,231
Folic acid 5 mg tablets	$436	$447	$458
Tetracycline eye ointment 1% of 5 g	$32,296	$33,105	$33,934
Artemether/Lumefantrine 20+120 mg dispersible tablets 1x6 pack	$101,292	$92,783	$83,786
Artemether/Lumefantrine 20+120 mg dispersible tablets 2x6 pack	$372,568	$341,271	$308,178
Artemether/Lumefantrine 20+120 mg tablets 3x6 pack	$289,904	$265,551	$239,801
Artemether/Lumefantrine 20+120 mg tablets 4x6 pack	$2,816,893	$2,580,264	$2,330,059
Chloroquine 250 mg tablets	$75,505	$69,163	$62,456
Chloroquine 50mg/5ml 60 ml bottle	$106,725	$97,760	$88,281
RDTs (test)	$8,088,244	$8,290,802	$8,498,588
TOTAL USD	**$30,140,072**	**$30,485,596**	**$30,830,061**
TOTAL ETB (Conversion 1 $USD = 17 ETB)	**512,381,229**	**518,255,134**	**524,111,030**
ICCM Products excluding Malaria Products			
TOTAL USD	$18,288,941	$18,748,002	$19,218,911

Introduction

Background

In February 2010, Ethiopia launched the Integrated Community Case Management (ICCM) of Common Childhood Illnesses to ensure the greatest possible reduction of mortality in children less than five years of age, and hence achieve the Millennium Development Goal (MDG) 4 by 2015. It is estimated that 360,000 Ethiopian children under the age of five die each year from preventable or treatable conditions. Many of these deaths and illnesses can be prevented at the community level by treatment offered by health extension workers (HEWs). ICCM targets the conditions that are the leading causes of morbidity and mortality among children less than five years of age, namely pneumonia, diarrhea, malaria, malnutrition, and insufficient newborn care. ICCM delivers lifesaving, curative interventions for these common childhood illness in the community, providing treatment where traditionally there has been little access to facility-based services. ICCM uses HEWs to scale up implementation of high impact child survival interventions and marks a paradigm shift for community health workers from *preventative* to *curative* care.

Between 2005 and 2011, more than 30,000 HEWs were deployed to 15,000 health posts located in rural kebeles, with an average of two HEWs assigned to each health post. In 2010, ICCM was initiated in Tigray, Amhara, SNNPR, Oromia, and Benishangul-Gumuz. From February-September 2011, 10,500 HEWs were trained on ICCM and began to treat pneumonia with cotrimoxazole. The goal is to train and equip 25,000 HEWs in ICCM by the end of 2012.

The Health Sector Development Program (HSDP) recognizes the importance of ensuring community access to essential medicines that are safe, effective and of assured quality. To achieve this, the Pharmaceutical Fund and Supply Agency (PFSA) developed an Essential Pharmaceuticals Procurement List and has conducted forecasts for pharmaceuticals with health facilities in order to undertake need-based procurement of pharmaceuticals. Moreover, in August 2010 PFSA led an integrated quantification exercise for pharmaceutical and supply requirements for HIV/AIDS, malaria and TB. However, other important public health programs including Family Planning (FP), expanded program on immunization (EPI), essential medicines, and neglected and tropical diseases (NTD) still conduct standalone quantification exercises to determine the product needs for their programs. In line with PFSA's plan to integrate all pharmaceuticals and health products, these will soon move to the national system of integrated quantification and distribution systems.

PFSA and its stakeholders agree that continuous product availability is imperative to achieve significant impact in the ICCM program's effectiveness and scale. Hence FMOH and PFSA designed a strategy to ensure product availability for ICCM following the rollout training. In the short term, this has entailed preparation and distribution of training and starter kits, quantifying the composition for the kits, and distributing the kits through UNICEF /ICCM partners and PFSA. The training kits have been distributed to the trained HEWs just after the training by UNICEF and ICCM partners. The Starter kits with supplies for an estimated six months per health post are ready for kitting at PFSA and will be distributed in batches of 500 health posts.

The preparation has been completed and the kitting is initiated. However, after the start-up phase is over and all HEWs have received their initial supplies, PFSA recognizes the importance of determining the requirements of actual demand through national ICCM quantification exercises, and intends to support regular resupply of individual products to health posts, based on actual consumption, rather than through kits.

Though ICCM does not require new products per se, as most of the ICCM products are also used for other programs and are already included in the list of essential medicines, quantifying the requirements for the program is crucial to understand the portion of products in the national supply chain that are required for the ICCM program. Furthermore, in the beginning of 2010 FMOH updated policy to allow health extension workers to dispense antibiotics for pneumonia at the community level and added zinc to the standard treatment guidelines for the treatment of diarrhea. Additionally, half of the products in the ICCM program are new to the HEWs and hence, PFSA decided to conduct a standalone quantification exercise for the first round of ICCM in October 2011 and will work to incorporate future ICCM forecasting efforts into integrated national quantification exercises.

Objectives of the national quantification exercises

The objectives of the quantification workshop were to:

1. Conduct national quantification for three years
2. Review quantification methodologies and collected data
3. Discuss data sources, gaps and how to address gaps
4. Discuss and come to consensus on assumptions for each condition
5. Draft three-year forecast and one-year supply plan
6. Discuss funding requirements and resource mobilization
7. Discuss system for regular review and updating of quantification and pipeline monitoring

Scope of Forecast

1. The scope of the forecast was for the five ICCM implementing regions:

- Tigray
- Amhara
- Oromia
- SNNPR
- Benishangul-Gumuz

The output from the workshop is one national forecast covering these five regions.

2. The conditions of interest for the forecast are: Pneumonia, Malaria, Diarrhea, Newborn care, and Malnutrition. The products included in the forecast include:

1. Cotrimoxazole 120 mg dispersible tablets
2. Paracetamol 100 mg tablets

3. Zinc 20 mg dispersible scored tablets
4. Low osmolarity ORS 1 L sachets
5. RUTF 92g sachets
6. Amoxicillin 125 mg/5ml suspension
7. Amoxicillin 250 mg dispersible tablets
8. Albendazole 400 mg tablets
9. Folic acid 5 mg tablets
10. Tetracycline eye ointment 1% tubes
11. Artemether/Lumefantrine 20+120 mg dispersible tablets 1x6 packs
12. Artemether/Lumefantrine 20+120 mg dispersible tablets 2x6 packs
13. Artemether/Lumefantrine 20+120 mg tablets 3x6 packs
14. Artemether/Lumefantrine 20+120 mg tablets 4x6 packs
15. Chloroquine 250 mg tablets
16. Chloroquine 50mg/5ml syrup
17. Malaria rapid diagnostic tests (RDTs)

The outputs are:

- ICCM forecast for program years 2012-2014
- Preliminary supply plan for the year 2012 to 2013

It was acknowledged that ICCM is a new program in Ethiopia and training kits have just been distributed to newly trained HEWs to provide services, especially for new products, so there is limited information about product use and service provision. Furthermore, ongoing funding for products has not yet been committed. Therefore, the results of this quantification exercise will be used largely for advocacy to ensure continuous availability of products for ICCM. As the ICCM program matures, more data can inform and refine future quantifications.

Methodology

In general, when conducting a quantification exercise, it is advisable to collect as many different types of data as possible—i.e. consumption or logistics data, service statistics, and demographic data. In adequately financed supply programs with reliable inventory control, distribution systems, stable disease patterns, and good prescribing practices, medicines and supply items can be ordered on the basis of projections from recorded past consumption. However, for new programs, such as the ICCM program, it may not be possible to collect various types of data. This may be the case when:

- Consumption and services information is unavailable, incomplete or unreliable;
- Problem related to prescribing patterns and consistency to standard treatment guidelines;
- The program is new or expanding rapidly;
- Available funds are not yet committed or are inadequate for projected needs.

In such cases, it is more appropriate to use demographic data and conduct forecasting to determine the quantity of products required through the demographic/morbidity method.

In preparation for the quantification workshop, all available data were collected and analyzed.

SC4CCM undertook data collection in Boloso Sore woreda in order to assess product availability and collect service and consumption data. Originally, the project intended to collect data from a representative sample of woredas across four regions (Tigray, Amhara, Oromia and SNNPR). However, further investigation revealed that due to the novelty of the ICCM program there was insufficient program data available in these regions and woredas. Therefore, since Boloso Sore has been a pilot site for ICCM and implementing partners had collected data, the assessment was only conducted in this woreda.

Data collection tools were prepared for each level (e.g. Woreda Health Office, health centers (HCs) and health posts (HPs)), and SC4CCM staff and a Wolayta Zonal Health Department representative collected data together. They used structured questionnaires, interviews, and reviewed registration reports to gather service statistics (e.g., case load) and referred to transaction records from the woreda pharmacy unit for consumption data (i.e., issues data). The intention was to reach all 5 health centers and 29 health posts in the woreda. However, 2 health centers were inaccessible during the rainy season, so the team was able to visit 3 health centers and 14 health posts.

Although services data provide some insights into health post service and consumption trends, due to limitations (i.e., small sample size, stock outs etc.), it cannot be used to extrapolate for all regions. As the ICCM program matures, PFSA and RHB will be able to improve registration and documentation and gather better data in the future. However, for this year's quantification, the workshop participates decided to use demographic data.

Participants considered the 2005 EDHS, 2011 EDHS and 2007 census projection, and demographic data from Bureau of Finance and Economic Development of the five ICCM implementing regions. Regional Health Bureaus (RHBs) provided updated population data of their regions estimates that was then used as the basis for the quantification to identify the target population of children under five living in rural areas of the five ICCM implementing regions. Using proportions from the 2007 census, participants further segmented the under-fives into one-year age groups, as necessary for several of the standard treatment guidelines. The populations used will be discussed further in the next section.

There are several challenges in producing an accurate estimation of the appropriate products needed for Ethiopia's ICCM program. These include availability of program data, reaching consensus among stakeholders on assumptions, and identifying funds to procure products for the program. The lack of consumption data or robust service reports is a significant risk of this forecast but close monitoring of stock levels and program/client trends will help improve this with time and lead to better and more accurate demand estimates in the future. Even though there was not much data to use for this year's forecast, it was agreed that this quantification exercise is important as a springboard for the ICCM program and would serve as a point of reference for future quantification exercises.

As the program matures, more consumption and services data will be available that can inform future quantifications. PFSA is implementing the Integrated Pharmaceuticals Logistics System (IPLS) which helps to get reliable data from health facilities. Some health posts are resupplied

from woreda health office pharmacy, but the plan is to transition all health posts to be resupplied by the health centers. The IPLS captures data from the health center level; since the health posts will get resupply quantities from and report to health centers, this data will be captured by the IPLS.

Therefore, after the assessment results from Boloso Sore and the demographic data were presented, and participants discussed options for data to use and decided to use the demographic/morbidity method. For the remainder of the first day and for the entire second day, participants discussed each of the five conditions in turn, developing forecasting trees to guide the assumption building process. Participants discussed and reached consensus on assumptions about incidence and prevalence rates, health seeking behavior, severity of condition (which determines whether HEWs treat or refer cases), and standard treatment guidelines. On the final day of the workshop, all the assumptions were summarized and a draft forecast for all products for the ICCM program was presented and discussed.

Assumptions for ICCM Conditions

General ICCM program assumptions

Given the lack of available consumption and services data, participants agreed to use demographic data and morbidity estimates to conduct demographic/morbidity based forecast. As the program matures and it is possible to collect more services and consumption data, updates and reviews of this quantification and future forecasts will be able to take service utilization and consumption data into consideration.

For population figures, participants agreed to use 2007 Ethiopian National Census data as a "placeholder" for target population figures in the five ICCM implementing regions, but collect and replace with updated population information from regions (Bureau of Finance and Economic Development). Subsequent to the workshop, all five regions provided updated population data and these figures were used for the final report, instead of National Census data predictions.

Participants agreed that the target population for ICCM program is children under age five who live in rural areas in the five ICCM implementing regions – Amhara, Benishangul Gumuz, Oromia, SNNPR, and Tigray. While data from the RHBs included information for total population, and occasionally more information, in some instances additional decisions were made to further break out sub-groups. Where not provided by RHBs, 2007 Census data were used to break out into rural/urban populations and proportion of children under age five.

Using these figures for 2011 – 2014, the following were agreed upon as the population for the five ICCM implementing regions for 2011 – 2014:

Table 2 – Rural Population Data from RHBs for ICCM Implementing Regions

	2011	2012	2013	2014
Total Rural Population of 5 ICCM Regions	62,156,782	63,702,638	65,297,975	66,934,487
Under 5 Population – rural of 5 ICCM Regions	9,537,963	9,777,969	10,025,778	10,280,040

Additionally, to follow the Standard Treatment Guidelines (STGs) for ICCM, it was sometimes necessary to further break down the under-five population into smaller age groups. Using population data by region by one year age bands for the five ICCM implementing region from the 2007 Census and calculating the proportions, we arrived at the following distribution by year:

Table 3 - One year age distribution for children under 5 in ICCM implementing regions (2007 Census) – includes all children (rural and urban)

2007 Census Data	Amhara	Benishangul Gumuz	Oromia	SNNPR	Tigray	ICCM Regions
Total Population under 5 (rural and urban)	2,331,480	108,525	4,462,415	2,348,587	629,517	9,880,524
% under 5	13.5%	16.2%	16.4%	15.6%	14.6%	15.3%
Age Breakdown						
0 - 1 year	18.1%	16.7%	16.2%	15.5%	18.8%	16.6%
1 - 2 years	19.2%	19.0%	18.6%	17.7%	18.1%	18.5%
2 - 3 years	20.4%	22.6%	22.1%	20.0%	20.4%	21.1%
3 - 4 years	20.8%	20.0%	20.5%	22.4%	21.7%	21.1%
4 - 5 years	21.5%	21.7%	22.7%	24.4%	21.0%	22.7%

We assumed that the age breakdown by one year age groups is constant (2007 – 2014), consistent across urban and rural populations, and projected forward using these distributions when necessary.

Furthermore, workshop participants agreed to the following general assumptions:

- 25,000 HEWs will be trained on ICCM by end of 2012
- Community awareness and confidence will increase demand for services from health posts and HEWs over time
- Health posts will be resupplied every month from their respective catchment health centers
- HEWs will be trained in supply chain and logistics management as designed by PFSA i.e. training on IPLS to improve proper management, utilization and record & report.

Expert review supported the following general assumptions regarding health care seeking behavior in Ethiopia in general and via the HEP. For certain conditions additional considerations were factored in and these were adjusted per-condition accordingly, as noted in the affected sections.

To determine what percentage of the population would seek care from any source, participants referred to the 2005 EDHS which cited 19% of population seen by health providers and the preliminary report for the 2011 EDHS which cited 27%. In addition to this, several additional factors considered.

HEWs not only see clients at the health posts but also promote health seeking behaviors by spending 50-75% of their time conducting outreach in the community. There are also health development army and community volunteers who are responsible for identifying potential clients and informing the HEWs. In addition to this, a few factors will help increase health-

seeking behavior. These include sensitization of community, product availability, and trained providers. Given the emphasis currently placed on the HEP it is likely that service uptake and coverage will increase. Therefore, participants concluded that the assumption for this quantification would be that 54% of people in the target population would seek health care from any source. This is double from the 2011 preliminary EDHS data, based on the assumption that the scale up of HEP and new initiative of health development army will increase overall access to healthcare and therefore health-seeking behavior.

In order to determine what proportion of people will seek care from health posts of HEWs, participants examined several factors. Experience from other CCM programs has shown that HEWs will "take" cases/volumes from other levels in the health system. Further, most of the work done to increase health-seeking behavior is focused on increasing services provided by the HEWs. Past experience from other programs shows 70% of population may seek care from community health workers.

One of the major factors considered were client preferences regarding cost and access. Services and products provided by health posts are free, but at health centers and other facilities clients will have to pay fees. Additionally, health posts are generally closer to where people live and likely to be more convenient for seeking health care. Therefore, participants decided to assume that of those that seek care from any source, 70% will seek treatment from HPs and HEWs.

Pneumonia Assumptions

At the outset, participants defined pneumonia as "cough plus fast breathing." The condition is assessed, classified, and treated by the HEW at the community level, as opposed to clinical diagnosis at a health facility. To estimate the incidence of childhood pneumonia, participants considered 0.35 episodes/child/year from a WHO study by Rudan et al (2008)[1]. This same report estimated 3.9 million cases of pneumonia per year in Ethiopia, a figure frequently cited in ICCM materials for Ethiopia.

In considering use of this incidence rate, participants discussed the following points. Rural pneumonia incidence rates may be higher than urban rates due to increased indoor air pollution (from cooking fires) and higher rates of malnutrition. This increased effect for rural populations may soon be balanced by the fact that the pneumococcal vaccine is starting to be introduced in Ethiopia (launched on 16th of October 2011); however, projections indicate that the vaccine will only reduce all pneumonia cases by 6% and it is expected that it should have the biggest impact on *complicated* pneumonia. Therefore, it may be that these different factors cancel each other out. If we want to factor them into quantification assumptions, we would need to establish rational methods for calculating the extent to which they increase/decrease pneumonia prevalence. Furthermore, it is understood that it takes some time to see the effect of interventions; they will likely not be felt for a number of years. In light of this information the following assumptions were agreed upon:

1. Participants agreed to use the 2008 WHO estimate of 0.35 cases/child/year for pneumonia in children under age five,

2. In order to disaggregate age groups to fit standard treatment guidelines for pneumonia, participants decided to use the full population proportion (0-1 year) acknowledging that the 0-2 month group is probably under-represented due to lag in birth registrations. To further determine the caseload by age range for the forecasting, we decided that since incidence of pneumonia is generally higher in younger children, treatment proportions should be weighted towards the two months to one year age group. Therefore the assumption used for this quantification is that 33% of cases would be children between two and twelve months and 67% would be children between one and five years.

3. To determine the rate of referral for children with severe pneumonia, several data sources were consulted. Participants concluded that 10% of pneumonia cases would be referred and 90% treated by HEWs

[1] Rudan I, Boschi-Pinto C, Biloglav Z, Mulholland K, Campbell H. 24. *Epidemiology and etiology of childhood pneumonia. Bull World Health Organ* 2008;86:408-16.

Table 4: Summary of Pneumonia assumptions

Pneumonia	**Input**
Annual incidence (episodes/child/year)	0.35
% seeking care (from any source)	54%
% of those seeking care from HEWs	70%
% severe pneumonia (referred)	10%
% uncomplicated (treated)	90%
Cotrimoxazole - age breakdowns % treated	
2 - 12 months	33%
1 - 5 years	67%
Cotrimoxazole - age breakdowns % referred	
2 - 12 months	33%
1 - 5 years	67%

Diarrhea Assumptions

For diarrhea the target population is the under-five rural populations in the five ICCM implementing regions. The expert group agreed upon the following assumptions:

1. Participants assumed that HEWs will provide zinc for all children (not breaking out the neonates).

Ethiopia has commonly used four to five cases of diarrhea per child per year as an estimated incidence for children under age five. Participants also considered the potential impact of intervention activities on diarrhea incidence such as improvements in drinking water, sanitation, and expected future introduction of the rotavirus vaccine.

Participants drew on experience from other countries, such as Peru and other countries in South America, where, despite years of intervention efforts and improvements to water and sanitation, there has been little change in incidence of diarrhea. The result of intervention efforts is that children still get diarrhea, but are less likely to die from it.

2. Therefore the participants decided to use an estimate of five (5) episodes/child/year for the incidence of diarrhea,

3. Participants then discussed the percentage of cases seen by HEWs that would be severe and moderate diarrhea. Based on expert opinion, participants agreed to the assumption that 8% of diarrhea cases would be severe and referred to a facility and 92% would be treated by HEWs.

4. Of those that will be treated by HEWs, it was assumed that 10% will be children under six months of age and 90% will be between six months and five years of age.

Participants discussed the standard course of treatment for ORS and how it would be used by HEWs. According to ICCM experts, sometimes HEWs only give the caregiver two sachets and use one of those for demonstration purposes. In proper demonstration techniques, HEWs should encourage proper use by demonstrating with one sachet and giving the caregiver two to take with her/him, which would require an additional sachet.

5. Therefore, the group agreed to estimate that three sachets of ORS would be required per course of treatment.

Table 5: Summary of Assumptions for Diarrhea

Diarrhea	**Input**
Annual incidence (episodes/child/year)	5
% seeking/obtaining care from any source	54%
% of those seeking/obtaining care from HPs/HEWs	70%
% severe (referred)	8%
% some or no dehydration (treated by HEWs)	92%
Zinc	
Under 6 months	10%
6 months - 5 years	90%
ORS	
0 - 5 years	100%

Newborn Eye Care Assumptions

Participants discussed the use of tetracycline 1% eye ointment (TTC) for the prevention of newborn eye infection transmitted during delivery. Currently, TTC is not in training kits but will be in starter kits for ICCM.

1. Participants agreed to the assumption that TTC will be given for all newborns seen by HEWs, as prophylaxis (against eye infection potentially contracted during delivery). In order to determine what percentage of births would be seen, participants first decided to use the crude birth rate for rural populations (36.2/1,000 population per 2011 EDHS) to estimate the number of births in rural areas of 5 ICCM regions.

   From this the group discussed how to estimate how many newborns are attended to or able to visit within 24hrs after delivery by a HEW. Based on FMOH plans and expert opinion, participants decided to assume that:
   - Percentage of births attended by HEW in their catchment area would be 12% women receiving post-natal visit (within 24 hours) in addition to those who were attended would be 7%.

2. So the assumption to use for this quantification is that 19% of births in rural areas will be seen by HEWs within 24 hours of birth and administered tetracycline eye ointment.

3. Of newborns attended to by a HEW, participants assumed that 100% would receive TTC ointment and that each birth would use one tube of TTC per application due to possibility of cross-contamination or perishability. To reduce wastage, participants suggested buying smaller pack sizes.

Table 6: Summary of Assumptions for Newborn Eye Care

Newborn Care	Input
Crude birth rate - per 1,000 rural population	36.2
% of newborns seen by HEWs within 24 hours of birth	19%
% of newborns seen by HEWs within 24 hours receiving TTC	100%

Malaria Assumptions

Participants agreed to build upon the assumptions used and forecast developed during the national integrated quantification exercise in August 2010 and determines what portion of that total forecasted amount is for ICCM program in the five regions. Participants agreed that the starting point for this forecasting is the total population living in rural areas in the five ICCM implementing regions. Unlike other conditions, this includes adults and children under age five as HEWs are authorized to treat adults for malaria. The following assumptions were agreed upon:

1. The group agreed to use the estimates of the population at risk (68%) by weight band and estimates of malaria incidence per weight band as used in the national integrated quantification conducted by PFSA in 2010.

2. Participants assumed that care seeking for malaria would be higher than other conditions due to increased awareness campaigns and outreach efforts encouraging caregivers to seek treatment for fever sooner, so agreed on 60% compared to 54% for pneumonia and diarrhea.

3. The group agreed that of those seeking care from any facility or provider, the percentage seeking care from HEWs would be 70% as with other conditions.

4. Participants assumed that 100% of those with fever seeking care from HEWs are tested with multi-species RDTs. Of those tested with an RDT, participants agreed on using the national figure of 47% for the positivity rate, acknowledging that this could range from 30-50%, depending on the season.

5. However, given the significant concurrent efforts to reduce the incidence and transmission of malaria in Ethiopia, participants decided to adjust the positivity rate downward by 5% for each year after 2012 due to prevention efforts such as long lasting insecticide treating nets, indoor residual spraying, and increased treatment.

   % Positive for malaria

2012	2013	2014
47%	42%	37%

   (Assumption = 5% drop in positive rate per year due to prevention and treatment efforts)

6. Following the integrated quantification methodology, participants agreed that of those that tested positive for malaria, the distribution of cases between the two species most common in Ethiopia would be 60% p. falciparum and 40% p. vivax.

7. Participants agreed that the percentage of malaria cases that are uncomplicated and will be treated by HEWs is 95% and 5% will be referred to higher level facilities.

8. Of those testing positive for p. vivax and receiving chloroquine, 15% will receive syrup while 85% will receive tablets.

9. Of those children under five who test positive for uncomplicated malaria and are treated, 10% will receive treatment for fever with paracetamol. 56.2% of those will be in the 2 months to 3 years age group (approximately 4 – 14 kgs) and 43.8% will be in the 3 – 5 years age group (approximately 14 – 19 kgs).

10. Of those patients who test negative for malaria, participants assumed that 100% of children under age five will be treated for fever with paracetamol. 56.2% of those will be in the 2 months to 3 years age group (approximately 4 – 14 kgs) and 43.8% will be in the 3 – 5 years age group (approximately 14 – 19 kgs).

Table 7: Summary of Assumptions for Malaria

Malaria	**Input**
Total Rural Population (adults) in 5 ICCM Regions	
Proportion of population at risk for malaria	68%
Distribution of population at risk	
5-14 kgs	8.70%
15-24kgs	16%
25 - 34 kgs	8.30%
> 35 kgs	67%
Annual incidence by weight band	
5-14 kgs	1.548
15-24kgs	1.161
25 - 34 kgs	0.774
> 35 kgs	0.232
Total estimated malaria cases - all weight groups	
% seeking care	60%
% seeking care from HPs/HEWs	70%
% tested by RDTs at HPs/HEWs	100%
% positive (declining 5% year over year)	47%
% Severe malaria (referred)	5%
Paracetamol - severe (referral)	
2 months - 3 years (4 - 14kgs)	56.20%
3 - 5 years (14 - 19 kgs)	43.80%
Cotrimoxazole - severe (referral)	
2 months - 12 months (4 - 10 kgs)	16.6%

1 year to 5 years (10 - 19 kgs)	83.4%
% uncomplicated malaria (treated by HEWs	95%
% p. vivax	40%
% p. falciparum	60%
Artemether Lumefantrine 20+120mg	
5-14 kgs 6x1	8.70%
15-24kgs 6x2	16%
25 - 34 kgs 6x3	8.30%
> 35 kgs 6x4	67%
Chloroquine	
% syrup	15%
% 2 - 12 months	33%
% 1 - 3 years	67%
% tablets	85%
Paracetamol - % uncomplicated malaria treated	10%
2 months - 3 years	56.20%
3 - 5 years	43.80%
FEVER	
Malaria negative	53%
Malaria negative < 35 kgs	33%
Paracetamol	
2 months - 3 years	56.20%
3 - 5 years	43.80%

% Positive for malaria

2012	2013	2014
47%	42%	37%

(Assumption = 5% drop in positive rate per year due to prevention and treatment efforts)

Malnutrition Assumptions

1. The target population for malnutrition for ICCM is the total rural population under five in the five ICCM implementing regions. Children under 6 months are generally all referred but there is limited data available to accurately break out the 0-6 months, so all were included for the purposes of this quantification.

2. Based on the 2011 preliminary EDHS data, participants agreed to use 2.8% as the rate of "severe acute malnutrition" (wasting) to determine the number of severely malnourished children in the five ICCM implanting regions.

3. Participants agreed that because of efforts from ICCM and other programs to actively identify cases of malnourishment in the community, the rate of seeking care would be higher for malnutrition than other conditions. Participants agreed that 75% of malnourished children would seek treatment from any source and of those, 80% would seek care from HEWs due to high levels of awareness-raising and outreach efforts.

4. Of those seen by HEWs, 10% would be classified as *complicated* severe acute malnutrition and referred to a health facility and 90% would be classified as *uncomplicated* acute malnutrition and treated by HEWs.

Additional assumptions needed to be made about the individual products for malnutrition and what children would receive.

5. Participants agreed that 100% of uncomplicated malnourished children would receive folic acid.

6. For RUTF, participants agreed that average of duration of treatment would be four weeks and would use the median weight band to determine the estimated weekly consumption of RUTF sachets (21), meaning that the average course of treatment would require 84 sachets of RUTF per child.

7. For severe complicated malnutrition cases that are referred it was agreed that the referral dose of amoxicillin suspension would be one bottle as it is not feasible to give only one dose and use the rest of the contents of the bottle for another child. This assumption was also held for children treated for malnutrition with amoxicillin suspension by HEWs.

8. To determine the proportion of children receiving amoxicillin suspension versus tablets/capsules, participants agreed that the split would be 25% for suspension and 75% for tablets.

9. To forecast for the multiple weight bands UNICEF uses an average of 21 tablets per treatment course per child for the 250 mg tablets and it was agreed that this would be used for this forecast.

As the group discussed these assumptions it was mentioned that frequently only amoxicillin capsule/ tablets are available which are not conducive to splitting if used for the younger age groups. As there are supply chain challenges associated with resupply of amoxicillin suspension, especially if one full bottle must be given per child even for a referral dose, it was suggested that dispersible amoxicillin be procured in the future.

Albendazole

During the course of the discussion, it became clear that it would be necessary to quantify for albendazole in two ways – one for general distribution of albendazole to all children aged two to five years for deworming and additionally distribution of albendazole for severely malnourished children.

Deworming:

1. For albendazole dispensed for general nutrition (i.e., deworming), participants agreed that the target population is children under five living in rural areas of the five ICCM implementing regions.

2. Of this group, children between two to five years would be given albendazole whenever they came in contact with a HEW to prevent infestation of intestinal worms. Therefore, using the assumptions developed for other conditions, participants agreed that of this population, 54% would seek treatment from any source, of these 70% would seek treatment from a HEW.

3. During this contact, for any condition, 100% of children two to five years of age would receive one 400mg albendazole tablet (1 tablet/treatment dose/child).

Uncomplicated malnutrition:

1. For albendazole dispensed as part of the treatment course for uncomplicated malnutrition by HEW, participants agreed to the assumption that of the 90% treated by HEWs, 100% of two to five year olds would receive one dose of albendazole.

Table 8: Summary of Assumptions for Malnutrition

Malnutrition	Input
Population 6 months - 5 years	100%
Severe malnutrition rate	2.80%
% seeking/obtaining care from any source	75%
% of those seeking/obtaining care from HPs/HEWs	80%
% Severe complicated malnutrition (referred)	10%
% Severe uncomplicated malnutrition (treated by HEWs)	90%
% anemia (# of cases treated)	100%
Amoxicillin - cases treated	
Suspension	25%
Tablets	75%
Amoxicillin - referral doses	
Suspension	25%
Tablets	75%
Albendazole	
% < 2 years	35.10%
% 2 - 5 years	64.90%
RUTF	
average sachets per child per week	21
average number of weeks of RUTF	4
sachets per treatment course	84
Children treated - severe uncomplicated	100%

Deworming	Input
Children 2 - 5 years	64.90%
% seeking care from any source - all conditions	54%
% of those seeking care from HPs/HEWs	70%
% receiving albendazole	100%

Forecasting results

Using the inputs discussed above, an Excel forecasting workbook was developed, with the assumptions and starting populations for each condition documented in an inputs table (the source for the summary tables for each condition above). From that, the inputs were linked to an output table for each year, organized by condition, with the standard treatment guidelines and course of treatment for each age or weight group by product. A summary table was created that aggregated the data into a table to include estimated quantities in basic units forecast by year for 2012 – 2014 (See Table 9).

An assumption was made to add a 5% wastage factor for quantities forecast to account for expire, spoilage and damage. The base forecast (before the wastage factor is added in) is presented in Table 9 and the quantities with the 5% wastage additions are presented in Tables 11 and 12.

Table 9 - Summary of forecast for ICCM products 2012 – 2014

Drug Name	2012 Annual estimated demand (tablets, packs, sachets, bottles, tubes, or tests) with 5% wastage	2013 Annual estimated demand (tablets, packs, sachets, bottles, tubes, or tests) with 5% wastage	2014 Annual estimated demand (tablets, packs, sachets, bottles, tubes, or tests) with 5% wastage
Cotrimoxazole 120 mg dispersible tablets	33,689,943	34,468,626	35,265,781
Paracetamol 100 mg tablets	23,001,745	23,037,390	23,060,816
Zinc 20 mg dispersible scored tablets	169,594,274	173,892,402	178,302,458
Low osmolarity 1 L sachets	55,108,437	56,505,083	57,938,100
RUTF sachets	13,039,743	13,370,217	13,709,297
Amoxicillin 125 mg/5ml syrup (100 ml bottles)	43,121	44,214	45,336
Amoxicillin 250 mg dispersible tablets	2,457,889	2,520,181	2,584,094
Albendazole 400 mg tablets	2,619,437	2,685,822	2,753,937
Folic acid 5 mg tablets	155,235	159,170	163,207
Tetracycline eye ointment 1% of 5 g (tubes)	460,054	471,576	483,395
Artemether/Lumefantrine 20+120 mg dispersible tablets 1x6 packs	240,485	220,283	198,923
Artemether/Lumefantrine 20+120 mg dispersible tablets 2x6 packs	442,269	405,117	365,834
Artemether/Lumefantrine 20+120 mg tablets 3x6 packs	229,427	210,154	189,776
Artemether/Lumefantrine 20+120 mg tablets 4x6 packs	1,852,001	1,696,426	1,531,926
Chloroquine 250 mg tablets	6,265,475	5,739,152	5,182,632
Chloroquine 50mg/5ml 60 ml bottles	276,419	253,199	228,647
RDTs (tests)	10,317,954	10,576,352	10,841,419

In order to calculate estimated costs of the forecasted quantities, price information for each product was needed. Where possible, prices for recent orders for these products for Ethiopia were included, using price data provided by UNICEF, PFSA, or prices for malaria products used in the recent integrated quantification. Where no price data was available, the quantification team

used the median price from the 2010 International Drug Price Indicator Guide. Where available the median buyer price was used, otherwise the median supplier price was used. Table 10 lists the products and the prices used for this forecast. Cells shaded in pink indicated prices obtained from the 2010 International Drug Price Indicator Guide[2].

Table 10 - Products and estimated prices for ICCM forecast (product costs only)

Product name and strength	Unit	Pack size	Units per carton/box	Price per unit (estimated)	Price per carton
Cotrimoxazole 120 mg dispersible tablets	Tablet	10 strips of 10 tablets	100	$0.01	$0.88
Paracetamol 100 mg tablets	Tablet	100 strips of 10 tablets	1000	$0.00572	$5.72
Zinc 20 mg dispersible scored tablets	Tablet	10 strips of 10 tablets	100	$0.031	$3.10
Low osmolarity 1 L sachets	Sachet	10 sachets in boxes of 100	1000	$0.090	$90.00
RUTF	Sachet	1 sachet	150	$0.37	$55.50
Amoxicillin 125 mg/5ml syrup	Bottle	100 ml bottle	1	$0.31	$0.31
Amoxicillin 250 mg dispersible tablets	caplet/tablet	500 tablets/caplets per bottle	500	$0.0320	$16.00
Albendazole 400 mg tablets	Tablet	1000 tablets per bottle	1000	$0.0159	$15.90
Folic acid 5 mg tablets	Tablet	1000 tablets per bottle	1000	$0.0024	$2.40
Tetracycline eye ointment 1%	Tube	5 g tube	50	$0.06	$3.00
Artemether/Lumefantrine 20+120 mg dispersible tablets 1x6	Pack	6 tablets	30	$0.36	$10.80
Artemether/Lumefantrine 20+120 mg dispersible tablets 2x6	Pack	12 tablets	30	$0.72	$21.60
Artemether/Lumefantrine 20+120 mg tablets 3x6	Pack	18 tablets	30	$1.08	$32.40
Artemether/Lumefantrine 20+120 mg tablets 4x6	Pack	24 tablets	30	$1.30	$39.00
Chloroquine 250 mg tablets	Tablet	1000 tablets per bottle	1000	$0.01	$10.30
Chloroquine 50mg/5ml	Bottle	60 ml bottle	1	$0.33	$0.33
RDTs	Kit	40 tests per kit	40	$0.67	$26.80

[2] http://erc.msh.org/mainpage.cfm?file=1.0.htm&module=DMP&language=English

With this information, it is possible to summarize the forecasted need with the estimated costs of the products. While this estimate is useful to consider product costs, it is very important to keep in mind that these estimates are for the product only and do not include the additional charges for freight, handling, insurance, and distribution that are associated with every shipment. Table 11 displays the estimated costs of products needed for the ICCM program from 2012 to 2014 and includes a 5% wastage factor added on to all quantities to account for expire, spoilage and damage and a 17% mark-up estimate on product prices to account for costs of freight, handling, insurance, clearance, storage, and distribution. The total cost is displayed in USD and Ethiopian Birr at the bottom of each column, using an approximate conversion factor of 17 ETB to $1 USD.

Given that the malaria products have already been quantified for these years in the National Integrated quantification and were included in this forecast only to determine the proportion of the total need for Ethiopia that would be served by the ICCM program, the estimated costs for products for each year are also displayed in $ USD without the malaria products included.

To allow comparisons of the estimated forecast for the ICCM program to quantities required for other programs and to estimate additional costs associated with procurement and distribution, Table 12 uses common bottle/carton sizes to display the estimated need for each product by year from 2012 - 2014. The figures in Table 12 also includes a 5% wastage factor added to forecast product needs and a 17% mark-up estimate to the product price to account for costs of freight, handling, insurance, clearance, storage, and distribution. However, as these figures do not take into account any additional quantities of products required to fill the pipeline to ensure adequate inventories at all levels of the system within the parameters of PFSA's inventory control system, the figures herein may not reflect the actual costs associated with the procurement and distribution of the products for the ICCM program. The full costs will be included in the preliminary supply plan which will be developed upon approval of this forecast.

Table 11 – Product forecasts 2012–2014 in basic units (5% wastage factor added plus 17% for CIF & distribution)

Drug Name	Basic Unit	Unit Cost	2012 Annual estimated demand (bottles, cartons, tubes, or kits) - INCL 5% wastage	2012 Estimated Cost (including 17% CIF and distribution)	2013 Annual estimated demand (bottles, cartons, tubes, or kits) - INCL 5% wastage	2013 Estimated Cost (including 17% CIF and distribution)	2014 Annual estimated demand (bottles, cartons, tubes, or kits) - INCL 5% wastage	2014 Estimated Cost (including 17% CIF and distribution)
Cotrimoxazole 120 mg dispersible tablets	tablet	$0.0088	336,899	$346,872	344,686	$354,889	352,658	$363,096
Paracetamol 100 mg tablets	tablet	$0.0057	23,002	$153,937	23,037	$154,175	23,061	$154,332
Zinc 20 mg dispersible scored tablets	tablet	$0.031	1,695,943	$6,151,184	1,738,924	$6,307,077	1,783,025	$6,467,030
Low osmolarity 1 L ORS	sachet	$0.090	55,108	$5,802,918	56,505	$5,949,985	57,938	$6,100,882
RUTF sachets	sachet	$0.37	86,932	$5,644,905	89,135	$5,787,967	91,395	$5,934,755
Amoxicillin 125 mg/5ml suspension 100 ml bottle	bottle	$0.310	43,121	$15,640	44,214	$16,037	45,336	$16,443
Amoxicillin 250 mg dispersible tablets	scored tablet	$0.0320	2,458	$92,023	2,520	$94,356	2,584	$96,748
Albendazole 400 mg tablets	tablet	$0.0159	2,619	$48,729	2,686	$49,964	2,754	$51,231
Folic acid 5 mg tablets	tablet	$0.0024	155	$436	159	$447	163	$458
Tetracycline eye ointment 1% of 5 g	tube	$0.060	460,054	$32,296	471,576	$33,105	483,395	$33,934
Artemether/Lumefantrine 20+120 mg dispersible 1x6 pack	pack	$0.360	8,016	$101,292	7,343	$92,783	6,631	$83,786
Artemether/Lumefantrine 20+120 mg dispersible 2x6 pack	pack	$0.72	14,742	$372,568	13,504	$341,271	12,194	$308,178
Artemether/Lumefantrine 20+120 mg tablets 3x6 pack	pack	$1.08	7,648	$289,904	7,005	$265,551	6,326	$239,801
Artemether/Lumefantrine 20+120 mg tablets 4x6 pack	pack	$1.30	61,733	$2,816,893	56,548	$2,580,264	51,064	$2,330,059
Chloroquine 250 mg tablets	tablet	$0.010	6,265	$75,505	5,739	$69,163	5,183	$62,456
Chloroquine 50mg/5ml 60 ml bottle	bottle	$0.33	276,419	$106,725	253,199	$97,760	228,647	$88,281
RDTs (test)	test	$0.67	257,949	$8,088,244	264,409	$8,290,802	271,035	$8,498,588
TOTAL USD				**$30,140,072**		**$30,485,596**		**$30,830,061**
TOTAL ETB (Conversion 1 $USD = 17 ETB)				**512,381,229**		**518,255,134**		**524,111,030**
ICCM Products excluding Malaria Products								
TOTAL USD				$18,288,941		$18,748,002		$19,218,911

Table 12 - Forecast quantities using common bottle and carton sizes 2012 – 2014 (includes 5% product wastage factor plus 17% increase in cost of product for estimated CIF and distribution costs)

Drug Name	Basic units per bottle, carton, kit	Package Unit	2012 Annual estimated demand (bottles, cartons, tubes, or kits) - INCL 5% wastage	2012 Estimated Cost (including 17% CIF and distribution)	2013 Annual estimated demand (bottles, cartons, tubes, or kits) - INCL 5% wastage	2013 Estimated Cost (including 17% CIF and distribution)	2014 Annual estimated demand (bottles, cartons, tubes, or kits) - INCL 5% wastage	2014 Estimated Cost (including 17% CIF and distribution)
Cotrimoxazole 120 mg dispersible tablets	100	bottle	336,899	$346,872	344,686	$354,889	352,658	$363,096
Paracetamol 100 mg tablets	1,000	bottle	23,002	$153,937	23,037	$154,175	23,061	$154,332
Zinc 20 mg dispersible scored tablets	100	strips (10x10)	1,695,943	$6,151,184	1,738,924	$6,307,077	1,783,025	$6,467,030
Low osmolarity 1 L sachets	1,000	carton	55,108	$5,802,918	56,505	$5,949,985	57,938	$6,100,882
RUTF sachets	150	carton	86,932	$5,644,905	89,135	$5,787,967	91,395	$5,934,755
Amoxicillin 125 mg/5ml suspension 100 ml bottle	1	bottle	43,121	$15,640	44,214	$16,037	45,336	$16,443
Amoxicillin 250 mg dispersible tablets	1,000	bottle	2,458	$92,023	2,520	$94,356	2,584	$96,748
Albendazole 400 mg tablets	1,000	bottle	2,619	$48,729	2,686	$49,964	2,754	$51,231
Folic acid 5 mg tablets	1,000	bottle	155	$436	159	$447	163	$458
Tetracycline eye ointment 1% of 5 g	1	tube	460,054	$32,296	471,576	$33,105	483,395	$33,934
Artemether/Lumefantrine 20+120 mg dispersible tablets 1x6 pack	30	carton	8,016	$101,292	7,343	$92,783	6,631	$83,786
Artemether/Lumefantrine 20+120 mg dispersible tablets 2x6 pack	30	carton	14,742	$372,568	13,504	$341,271	12,194	$308,178
Artemether/Lumefantrine 20+120 mg tablets 3x6 pack	30	carton	7,648	$289,904	7,005	$265,551	6,326	$239,801
Artemether/Lumefantrine 20+120 mg tablets 4x6 pack	30	carton	61,733	$2,816,893	56,548	$2,580,264	51,064	$2,330,059
Chloroquine 250 mg tablets	1,000	bottle	6,265	$75,505	5,739	$69,163	5,183	$62,456
Chloroquine 50mg/5ml 60 ml bottle	1	bottle	276,419	$106,725	253,199	$97,760	228,647	$88,281
RDTs (test)	40	kit	257,949	$8,088,244	264,409	$8,290,802	271,035	$8,498,588
TOTAL USD				**$30,140,072**		**$30,485,596**		**$30,830,061**
TOTAL ETB (Conversion 1 $USD = 17 ETB)				**512,381,229**		**518,255,134**		**524,111,030**
ICCM Products excluding Malaria Products								
TOTAL USD				$18,288,941		$18,748,002		$19,218,911

The quantities and prices reflected in this document thus far are forecasts and estimates only and should not be used for procurement. For the purposes of this forecast all quantities are expressed in basic units (e.g. tablets, packs, bottles, tests, or tubes), with the exception of Table 12, which converts the basic units to commonly available bottle and carton size to compare the relative size of the needs for this program to others.

Supply Plan

The supply planning process is a critical step in ensuring that products are continuously available for the program and for clients at the community level. The supply plan provides information on the quantities of drugs and products expected, including costs and their shipment schedules. This ensures that stock levels are maintained between the desired inventory control levels. In planning procurement, the program takes into consideration the user requirements, the stock on hand, the lead time of the suppliers and the buffer stock to protect the program in cases of an unusual increase in demand or delays in shipments

The supply plan includes the quantities of products needed to fill the national pipeline in accordance with inventory control parameters set by PFSA to ensure continuous availability of supplies and accounting for supplier lead times and distribution channels and schedules from the national level to health posts. The maximum/minimum levels of inventory (measured in months of stock, based on average monthly consumption) for each level of the supply chain were discussed during the quantification workshop and documented. For the PFSA system, the maximum and minimum stock level was set at 15 months and 7 months of stock respectively. This included a max-min stock level of 5 and 2 months at the central level, 4 and 2 months at the regional level, 4 and 2 months at the facility levels, and 2 and 1 months at the health post level. The desired months of stock was estimated to be 11 months for all products, with the exception of RUTF. Due to the bulky nature of the product and storage constraints the desired months of stock for RUTF was reduced to 10 months.

The forecasted quantities of drugs for the period of the forecast (January 2012 – December 2012) were then entered in the PipeLine software to calculate proposed quantities and shipment dates to ensure that the stocks are managed properly within the desired stock levels to avoid overstocking or stock outs. In proposing the shipment quantities and dates, PipeLine takes into account the stock on hand, quantities of drugs on order, the buffer stock, the supplier lead time and the desired maximum and minimum inventory levels of the program as elaborated above.

It was decided that for most products the current stock on hand of ICCM products is already allocated for the ICCM training and starter kits, and in some cases had been “borrowed” from PFSA until additional stock for ICCM was procured. Therefore, the stock on hand for most products was considered to be zero. The exception to this is for zinc 20mg tablets and cotrimoxazole 120mg tablets. SOH data from PFSA as of the quantification in October was used for these products; for all other products SOH is considered zero for the purposes of this supply plan.

As funding and procurement for the ICCM program is uncertain at this point all suppliers are listed as PFSA and funding source is listed as unknown. This is to provide a preliminary supply plan for 2012, should full funding be available, so all first shipments are scheduled for arrival in March 2012. Subsequent shipments are planned quarterly throughout the year. PFSA is currently transitioning from 240 day lead time to 120 day lead time, therefore for this supply plan the average of a 180 day lead time (6 months) was used.

The supply plan includes a wastage factor of 5% and estimates the costs associated with shipping, insurance, handling, customs clearance, and distribution fees set at each level to be 17%. It should be noted that the further into the future a forecast projects, the less accurate it is likely to be. Given that there may be significant changes in the ICCM program and disease etiology, it is likely that the accuracy of the assumptions will decline in the future. Therefore, these forecasts should be reviewed and updated with new information regularly, ideally at six month intervals.

Summary of assumptions included in the ICCM supply plan:

- 5% wastage factor added to forecast quantities
- 17% additional cost added to product costs for freight, insurance, and distribution costs
- SOH = 0 for all products except:
    - Cotrimoxazole 120mg tablets = 1,500,000 tablets expiry Jan 2014
    - Zinc 20mg tablets = 27,000,000 tablets expiry Jan 2012
- PFSA as supplier for all products
- Lead time = 6 months (order to ship = 4 months, ship to order = 2 months)
- Inventory Control Min/Max levels in months of stock
    - Central: 2 / 5
    - Regional: 2/ 4
    - Facilities (HC): 2 / 4
    - HEW/HP: 1 / 2
    - Whole system: 7 / 15
- Desired months of stock (all levels) = 11 for all products except for RUTF. Desired months of stock for RUTF was reduced to 10, due to bulky nature and storage constraints
- Quarterly shipments for all products; planned arrivals starting in March 2012 (then July 2012, October 2012, December 2012)

Required shipments

Based on the stock on hand and estimated consumption rates for products in the coming year, the table below shows the proposed supply plan. This represents the timeline by which shipments should be received in country to meet CCM needs, based on the forecast for 2012 that was developed in October 2011. The first shipment was timed to arrive in March 2012 and additional orders quarterly through 2012, in order to represent the costs associated with filling the pipeline and supporting the program through 2012. This shipment schedule should be adjusted as needed per product characteristics (bulkiness, shelf life, etc.) or funding and procurement cycles. Changing the desired months of stock will also affect the procurement plan so should also be reconsidered once the amount of funding becomes clearer. The table below shows the supply plan proposed for 2012.

Funding Source = Unknown **----------Costs in $ USD----------**

Receipt Date	Quantity (in basic units)	Product	Freight	Total
Antimalarials				
Artemether Lumefantrine 120/20mg 3x6				
31-Mar-12	267,690	$ 289,105	$ 49,148	$ 338,253
31-Jul-12	76,470	$ 82,588	$ 14,040	$ 96,627
31-Oct-12	57,330	$ 61,916	$ 10,526	$ 72,442
31-Dec-12	38,250	$ 41,310	$ 7,023	$ 48,333
Artemether Lumefantrine 120/20mg 4x6				
31-Mar-12	2,160,690	$ 2,808,897	$ 477,512	$ 3,286,409
31-Jul-12	617,310	$ 802,503	$ 136,426	$ 938,929
31-Oct-12	463,020	$ 601,926	$ 102,327	$ 704,253
31-Dec-12	308,700	$ 401,310	$ 68,223	$ 469,533
Artemether Lumefantrine 120/20mg dispersible 1x6				
31-Mar-12	280,560	$ 101,002	$ 17,170	$ 118,172
31-Jul-12	80,160	$ 28,858	$ 4,906	$ 33,763
31-Oct-12	60,150	$ 21,654	$ 3,681	$ 25,335
31-Dec-12	40,110	$ 14,440	$ 2,455	$ 16,894
Artemether Lumefantrine 120/20mg dispersible 2x6				
31-Mar-12	516,000	$ 371,520	$ 63,158	$ 434,678
31-Jul-12	147,420	$ 106,142	$ 18,044	$ 124,187
31-Oct-12	110,550	$ 79,596	$ 13,531	$ 93,127
31-Dec-12	73,710	$ 53,071	$ 9,022	$ 62,093
Chloroquine 250mg tablet				
31-Mar-12	7,310,000	$ 75,293	$ 12,800	$ 88,093
31-Jul-12	2,089,000	$ 21,517	$ 3,658	$ 25,175
31-Oct-12	1,566,000	$ 16,130	$ 2,742	$ 18,872
31-Dec-12	1,044,000	$ 10,753	$ 1,828	$ 12,581
Chloroquine syrup				
31-Mar-12	322,490	$ 106,422	$ 18,092	$ 124,513
31-Jul-12	92,140	$ 30,406	$ 5,169	$ 35,575
31-Oct-12	69,094	$ 22,801	$ 3,876	$ 26,677
31-Dec-12	46,069	$ 15,203	$ 2,584	$ 17,787
Malaria RDT				
31-Mar-12	12,037,640	$ 8,065,219	$ 1,371,087	$ 9,436,306
31-Jul-12	3,439,320	$ 2,304,344	$ 391,739	$ 2,696,083
31-Oct-12	2,579,480	$ 1,728,252	$ 293,803	$ 2,022,054
31-Dec-12	1,719,600	$ 1,152,132	$ 195,862	$ 1,347,994
Malaria Products Total		*$ 19,414,310*	*$ 3,300,432*	*$ 22,714,738*
Essential Drugs				
Albendazole 400mg tablet				
31-Mar-12	3,056,100	$ 48,592	$ 8,261	$ 56,853
31-Jul-12	873,100	$ 13,882	$ 2,360	$ 16,242
31-Oct-12	654,900	$ 10,413	$ 1,770	$ 12,183
31-Dec-12	436,600	$ 6,942	$ 1,180	$ 8,122
Amoxicillin 125mg suspension				
31-Mar-12	50,302	$ 15,594	$ 2,651	$ 18,245

31-Jul-12	14,372	$ 4,455	$ 757	$ 5,213
31-Oct-12	10,790	$ 3,345	$ 569	$ 3,914
31-Dec-12	7,235	$ 2,243	$ 381	$ 2,624
Amoxicillin 250mg tablet (dispersible)				
31-Mar-12	2,868,000	$ 91,776	$ 15,602	$ 107,378
31-Jul-12	819,000	$ 26,208	$ 4,455	$ 30,663
31-Oct-12	614,500	$ 19,664	$ 3,343	$ 23,007
31-Dec-12	409,500	$ 13,104	$ 2,228	$ 15,332
Folic Acid 5mg				
31-Mar-12	181,200	$ 435	$ 74	$ 509
31-Jul-12	51,700	$ 124	$ 21	$ 145
31-Oct-12	38,800	$ 93	$ 16	$ 109
31-Dec-12	25,900	$ 62	$ 11	$ 73
ORS low osmolarity 1L sachet				
31-Mar-12	64,294,000	$ 5,786,460	$ 983,698	$ 6,770,158
31-Jul-12	18,369,000	$ 1,653,210	$ 281,046	$ 1,934,256
31-Oct-12	13,777,000	$ 1,239,930	$ 210,788	$ 1,450,718
31-Dec-12	9,185,000	$ 826,650	$ 140,531	$ 967,181
Paracetamol 100mg tablet				
31-Mar-12	26,835,400	$ 153,498	$ 26,095	$ 179,593
31-Jul-12	7,667,300	$ 43,857	$ 7,456	$ 51,313
31-Oct-12	5,750,400	$ 32,892	$ 5,592	$ 38,484
31-Dec-12	3,833,600	$ 21,928	$ 3,728	$ 25,656
Tetracycline Eye Ointment 1% 4g				
31-Mar-12	536,732	$ 32,204	$ 5,475	$ 37,679
31-Jul-12	153,352	$ 9,201	$ 1,564	$ 10,765
31-Oct-12	115,003	$ 6,900	$ 1,173	$ 8,073
31-Dec-12	76,663	$ 4,600	$ 782	$ 5,382
Essential Drugs Total		*$ 10,068,262*	*$ 1,711,607*	*$ 11,779,870*
ICCM Pediatrics				
Cotrimoxazole 120mg dispersible tablet				
31-Mar-12	37,805,000	$ 332,684	$ 56,556	$ 389,240
31-Jul-12	11,230,000	$ 98,824	$ 16,800	$ 115,624
31-Oct-12	8,422,500	$ 74,118	$ 12,600	$ 86,718
31-Dec-12	5,615,000	$ 49,412	$ 8,400	$ 57,812
RUTF				
31-Mar-12	14,126,400	$ 5,226,768	$ 888,551	$ 6,115,319
31-Jul-12	4,346,700	$ 1,608,279	$ 273,407	$ 1,881,686
31-Oct-12	3,259,950	$ 1,206,182	$ 205,051	$ 1,411,232
31-Dec-12	2,173,200	$ 804,084	$ 136,694	$ 940,778
Zinc acetate 20mg dispersible tablet				
31-Mar-12	170,860,000	$ 5,296,660	$ 900,432	$ 6,197,092
31-Jul-12	56,531,500	$ 1,752,477	$ 297,921	$ 2,050,398
31-Oct-12	42,398,500	$ 1,314,354	$ 223,440	$ 1,537,794
31-Dec-12	28,265,800	$ 876,240	$ 148,961	$ 1,025,201
ICCM Pediatrics Total		*$ 18,640,082*	*$ 3,168,813*	*$ 21,808,894*
ICCM Products Total		**$ 48,122,654**	**$ 8,180,852**	**$ 56,303,502**

Discussion and Next steps

Discussion of forecast results

This forecast is the estimate of the total need based on the best program information and assumptions available at the time of the quantification exercises. There are a few important notes about this forecast that should be considered when reviewing the outputs. First of all, these are forecast quantities needed for the coming three years (2012-2014), but do not represent the total quantities to procure. A preliminary supply plan was developed based on this forecast to account for additional factors such as the length of the pipeline, the inventory control system parameters, and stock on hand, to ensure that funding and the quantities procured are sufficient to meet the program needs. This will need to be revised for each product once funding is secured so procurement planning can begin with more current information (stock on hand, any updates on consumption) and the specific parameters of the funding source and procurement body (lead time, funding cycle). Furthermore, the estimated costs herein represent the estimated product and shipping and handling costs only and thus are illustrative. The actual procurement process may yield different prices and all products will be subject to shipping and handling, insurance, and distribution fees, as well as any additional costs associated with their management. However, the figures can be used as estimates to help compare requirements with available funding and advocate for additional funding to cover the product needs.

As mentioned previously, the recent integrated quantification exercises included the total need for malaria products; therefore the results here represent a subset of that need – the estimated quantities for the ICCM program. There is also likelihood that for some of these products there may be overlap between other programs. For instance, RUTF is included as treatment at the community level by OTP nutrition programs, ICCM, and perhaps others. Similarly, albendazole is included as a nutrition product. The estimates herein reflect the total child need so it will be important to coordinate with other programs to ensure that needed supplies are not overestimated.

As with any forecast, the outputs are only as accurate as the inputs. While the inputs provided by the experts involved are considered sound and were validated within the workshop, they should be reviewed and updated frequently. Given that the ICCM program is new and this forecast was based on demographic and morbidity data only, it will be advisable to review this forecast within six months to one year and update it as new information becomes available, especially with service and consumption data as the program continues to roll out to HEWs. The supply plan should be updated quarterly.

Further, it is critical for all who come in contact with the ICCM program monitor program progress and use data collected to improve the quality of services offered. A key component of program success is the provision of products that are not only clinically effective but also meet the needs and preferences of HEWs, caregivers, and children in the community. Therefore it is important to collect information about the types of products that are available and how they might be improved via different product selection. For example, two products for the ICCM

program are currently available and procured for ICCM in dispersible formulations – zinc and Coartem (1x6 and 2x6) – which should make them easier to dispense to younger children. There may be opportunity to purchase additional products in dispersible formulations in the future, such as cotrimoxazole and amoxicillin. This may reduce the need for HEWs to manage bulkier products that serve fewer patients, such as bottles of suspension. However, the zinc tablets need to be split for the youngest children so it will be important to monitor product integrity throughout its use and, if necessary, consider lower strength products for future procurements. Further, there may be specific packaging requirements for the community level, such as blister packs or smaller packages to increase ease of distribution to health posts and improve availability. This type of information is part of the continuous improvement process that is necessary to ensure that the program is as effective as possible to reduce child mortality and achieve MDG 4.

Further, several participants noted that there are additional products included in the ICCM standard treatment guidelines that were not within the scope of this quantification. Examples of these include Vitamin K, Vitamin A, and rectal artesunate. If the advisory committee determines that these should be included in the quantification assumptions will need to be developed for these products. This may require an update or could occur within the next review of the forecast.

The Way forward for Quantification Exercises

Following the ICCM quantification workshop, stakeholders will review the data and revise as needed. A draft report including a preliminary one year supply plan will be presented by the advisory committee to PFSA. Upon review and approval the report will be finalized and disseminated. This report will provide a more detailed picture of the program requirements and necessary timing for future shipments to share with partners and potential donors to advocate for program funding. Once funding is confirmed the preliminary supply plan should be updated based on more current stock on hand information and any updates on monthly consumption rates and shipments planned according to estimated needed receipt date. Additionally, alternate suppliers may have updated information on lead time, product prices, and shipping, insurance, and handling costs.

After this it will be critical to review the quantification and update it at least annually and even more frequently if new information that affects the current assumptions becomes available. Ideally, ICCM will be integrated with the national quantification process within the next few years, so PFSA will coordinate the regional health bureaus and other partners for this process. PFSA needs support from stakeholders and donors to support the requirement of this forecast. Moreover, PFSA with ICCM logistics sub group may consider additional products (e.g. rectal artesunate, Vitamin K etc.) that might necessitate revision sooner than expected.

PFSA is also calling upon all regional health bureaus and partners to highlight the importance of data for conducting quantification exercises. It has been underlined that PFSA designed and is aggressively implementing IPLS as mechanism and vehicle to improve the facility and PFSA level inventory management and logistics management information systems thereby contributing and institutionalizing quantification exercises like this one.

Annex 1: ICCM National Quantification Exercise Workshop Agenda

Monday, October 3	Tuesday, October 4	Wednesday, October 5
8:00 – 8:30 Registration	8:30 – 8:45 Introduction to the day Recap from previous day	8:30 – 8:45 Introduction to the day Recap from previous day
8:30 – 8:35 Welcome (Bekele A./PFSA)		
8:35 – 8:45 Opening Remarks (Yared Y./PFSA)	8:45 – 10:00 **Diarrhea** – ORS, zinc (Plenary/Facilitator: Dessalegn)	8:45 – 10:00 Brief overview of supply planning, including data needs and methodology Presentation of summary of assumptions for validation and discussion (Lilia/SC4CCM)
8.45– 9:00 Workshop Objectives (Lilia/SC4CCM)		
9.00– 9:30 Overview of National Pharmaceutical Logistics System (Yared Y./PFSA)		
9.30– 10:00 ICCM Program Background (Dessalegn/SC4CCM)		
10:00 – 10:30 Break	**10:00 – 10:30 Break**	**10:00 – 10:30 Break**
10:30 – 11:30 Overview of quantification (Gadissa/SC4CCM)	10:30 – 12:30 **Newborn Care** – tetracycline eye ointment Discuss, agree upon and document assumptions (Plenary/Facilitator: Dessalegn)	10:30 – 11:30 Presentation of draft forecasts and discussion of preliminary quantification outputs (Plenary/Facilitator: Alexis/SC4CCM)
11:30 – 12:30 Results of Boloso Sore assessment (Dawit/SC4CCM)		11:30 –1 2:30 Discuss quantification review, monitoring, and coordinating funding Next steps and closing remarks (Alem/PFSA)
12:30 – 1:30 Lunch	**12:30 – 1:30 Lunch**	**12:30 – 1:30 Lunch and Farewell**
1:30 – 2:00 Overview of demographic data and assumption building process (Alexis/SC4CCM)	1:30 – 3:30 **Malaria**– ACTs (4), chloroquine (2), paracetamol, RDTs Discuss, agree upon and document assumptions (Plenary/Facilitator: Anteneh Tsige/FMOH)	
2:00 – 3:30 **Pneumonia** – cotrimoxazole: Discuss, agree upon and document assumptions (Plenary/Facilitator: Abdurahman Abdo, UNICEF)		
3:30 – 4:00 Coffee Break	**3:30 – 3:45 Coffee Break**	
4:00 – 5:00 **Pneumonia** (cont.) (Plenary)	3:45 – 5:30 **Malnutrition**–RUTF, amoxicillin (2), albendazole, folic acid Discuss, agree upon and document assumptions (Plenary/Facilitator: Abdurahman Abdo, UNICEF)	
5:00 – 5:30 Q&A and Wrap up (Dessalegn/SC4CCM)		

Annex 2: Participant List

Name	Institution	Responsibility	Address	
			Telephone	Email
Bekele Ashegine	PFSA - Central	Forecasting & Capacity Building Officer	0913138202	bekelepd@yahoo.com
Fiseha Mamo	IFHP	System Strengthening Advisor	0911914818	fismamo@yahoo.com
Hailu Abera	ORHB	Family Health Expert	0911301966	hailuabe70@yahoo.com
Gezahegn Tamir	ARHB	Nutrition officer	0918764960	gtatamir@yahoo.com
Gudisa Asefa	FMOH	Health pro. & Disease. Prev. Off	'0920499275	gudisaasefa@yahoo.com
Saul Morris	BMGF	Sr. Program Officer	-	saul.morris@gatesfoundation.org
Yosef Wakwoya	MSH/SPS	Training Tem Leader	0911840960	ywakwoya@msh.org
Anteneh Tsige	FMOH/MSH	Pharmacy mgt. Associate	0911605941	atsige@msh.org
Zeleke Abesi	RHB	Distribution Officer	0911091102	abesiyaua@yahoo.com
Sisay Tadele	PFSA - Central	Forecasting Capacity Building Officer	0913708987	sisaytadele99@yahoo.com
Gidey G/Libanos	TRHB	PHEM Expert	0914728656	gideylibanos@yahoo.com
Mulugeta Berihan	SC-UK	ICCM project co.	0911805470	muber_2007@yahoo.com
Henok Hailemariam	DELIVER	Health Post Resupply Advisor	0911656377	henokbenti@yahoo.com
Redwan Mohammed	ORHB	Drug Dist. & Proc. Manager	0911842189	rud3m-robe@yahoo.com
Tadesse Gossaye	IRC	Health Coordinator	0911702007	Tadesse.Gossaye@rescue.org
Alexyv Gizachew	SCMS	Quantification Advisor	9011881700	agizachew@et.pfscms.org
Abdurahman Abdo	UNICEF	Logistic Officer	0911626246	abdo@unicef.org
Hunduma Dinsa	PFSA, Adama	Forecasting & Capacity Building Officer	0920280925	hindumadinsa@yahoo.com
Alem Tewelde	PFSA, Adama	Branch Manager	0911339858	yummyalem@gmail.com
Agazi Ameha	JSI/L10K	M&E Specialist	0911967786	aameha@jsi.ltenk.org.et
Yared Yiegezu	PFSA - Central	Director of Forecasting & Capacity Building	0911109445	yaredyiegezu@yahoo.com
Fekadu kefitaw	SNNPRHB	Logistic Officer	0916497459	fkefitaw@yahoo.com
Mulugeta Abraha	PFSA/ TB CARE I	Pharmaceutical Management Adv.	0911404889	bella_mulu@yahoo.com
Melesse Jenbolla	SC-USA	Regional CCM Coordinator	0911877545	mjenbolla@savechildren.org
Tesfa Etana	BG RHB	Community Officer	0917229059	

Gaddisa Homa	JSI/SC4CCM	RCHLA – Oromia	0911313430	ofisbar@yahoo.com
Solomon Gelaw	JSI/SC4CCM	RCHLA – Amhara	0918710454	dattsoll@gmail.com
Dawit Getachew	JSI/SC4CCM	RCHLA - Tigray & SNNPR	0911563531	dawitgt2005@gmail.com
Dessalegn Tesfaye	JSI/SC4CCM	Resident Logistics Advisor	0911113401	dessalegntm@gmail.com
Alexis Heaton	JSI/SC4CCM	JSI HQ Advisor	0920343117	alexis_heaton@jsi.com
Lilia Gerberg	JSI/SC4CCM	JSI HQ Advisor	0920343118	lilia_gerberg@jsi.com
Saul Morrison	BMGF	Senior Program Officer,		Saul.Morris@gatesfoundation.org

Annex 3: References

Central Statistical Agency (CSA) and MEASURE DHS, ICF Macro. 2011. *The Ethiopia Demographic and Health Survey (EDHS): Preliminary Report*. Addis Ababa, Ethiopia.

Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). 2008. *Ethiopia National Malaria Indicator Survey 2007: Technical Summary*.

Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). Health Extension Worker (HEW) Chart booklet.

Federal Democratic Republic of Ethiopia Ministry of Health (FMOH). 12 February 2010. *National Implementation Plan for Community-based Case Management of Common Childhood Illnesses (Draft 1).*

Federal Democratic Republic of Ethiopia Population Census Commission/UNFPA. 2008. *Summary and Statistical Report of the 2007 Population and Housing Census: Population Size by Age and Sex*. Addis Ababa, Ethiopia.

Integrated Family Health Program (IFHP). 2009. *Implementing Integrated Care Management of Newborn and Childhood Illness with the Health Extension Program*. Boloso Sore, SNNPR, Ethiopia.

Pharmaceuticals Fund and Supply Agency (PFSA). December 2010. *Report on Quantification Review Exercise HIV/AIDS, TB and Malaria Pharmaceuticals and Related supplies Requirements for the Federal Republic of Ethiopia: 2011 to 2015*. Addis Ababa.

Rudan I, Boschi-Pinto C, Biloglav Z, Mulholland K, Campbell H. 24. *Epidemiology and etiology of childhood pneumonia.* Bulletin of the World Health Organization. 2008;86:408-16.

UNICEF/WHO. 2009. *Diarrhea: why children are still dying and what can be done*. Accessed at: http://whqlibdoc.who.int/publications/2009/9789241598415_eng.pdf on October 20, 2011.