

# Rwanda

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## Community Health Supply Chain Baseline Assessment Report

September to November 2011





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## **SC4CCM Project**

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

## **Recommended Citation**

SC4CCM. 2011. *Rwanda Community Health Supply Chain Baseline Assessment Report*. Arlington, Va.: SC4CCM.

## **Cover photos:**

Community health worker drug box in Rwanda



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## Acronyms

ASC	agents de santé communautaire (community health worker)
ASCB	agents de santé communautaire binômes (CCM community health worker)
BUFMAR	Bureau des Formations Medicales Agréées du Rwanda
CAMERWA	Centrale d'Achats de Médicaments Essentiels du Rwanda
CCM	community case management
CHD	Community Health Desk
CHW	community health workers
C-IMCI	community Integrated Management of Childhood Illnesses
CS	centre de santé (health center)
DOV	day of visit
DVW	data validation workshops
FEFO	first-to-expire, first-out
HC	health center
JSI	JSI Research & Training Institute, Inc.
LIAT	Logistics Indicator Assessment Tool
LMIS	Logistics Management Information System
LSAT	Logistics System Assessment Tool
MOH	Ministry of Health
NURSPH	National University of Rwanda School of Public Health
ORS	oral rehydration solution
PPS	probability proportional to size
SC	supply chain
SC4CCM	Supply Chains for Community Case Management
SMS	short message service
SOP	standard operating procedures
SPH	National University of Rwanda School of Public Health
TOC	Theory of Change





## Executive Summary

The Improving Supply Chains for Community Case Management of Pneumonia and Other Common Diseases of Childhood Project (SC4CCM) is focused on finding affordable, simple and sustainable supply chain solutions that address the unique challenges of community health workers (CHWs)/Agents de Santé Communautaire (ASC). Our goal is to demonstrate that product availability can be significantly improved at the lowest levels of the supply chain, thereby contributing to improved child health in communities. To achieve this goal the project is committed to using evidence to generate best practices that can be taken to scale.

To develop a better understanding of the existing supply chain at the community level and inform our intervention strategy a baseline assessment was undertaken in collaboration with the Ministry of Health (MOH) and the National University of Rwanda School of Public Health (SPH) from September 13th, 2010 to November 12th, 2010. The assessment covered ten districts, 100 health centers, and 321 community health workers.

The objectives of the assessment were to identify strengths and gaps in the existing supply chain for community case management (CCM), identify factors of supply chain performance to inform the design of an intervention strategy and to provide baseline data to measure the impact of the supply chain interventions later in the life of the project.

The SC4CCM project developed a Theory of Change (TOC) model that provides the framework for all project activities: assessment, identification of solutions and innovations, monitoring of change, and demonstration of success. This report presents the results in relation to the five direct preconditions from the project TOC which we believe are necessary building blocks to achieving CCM product availability at the CHW level. The five direct preconditions are:

- Necessary usable quality CCM products are available at CHW resupply points;
- CHWs or personal responsible for CHWs resupply know how, where, what, when and how much of each product to requisition or resupply and act as needed;
- CHWs have adequate storage: correct conditions, security and adequate space;
- Goods are routinely transported between resupply points and CHWs; and
- CHWs are motivated to perform their roles in the CCM products supply chain.

The purpose of this report is to share the preliminary findings for the baseline assessment and to suggest possible recommendations to improve the overall performance of the supply chain for community health. The report presents the methodology used throughout the baseline assessment and the limitations encountered, provides details of findings and inputs from participants at data validation workshops (DVWs).

Assessment results show that 208 of the total 321 CHWs visited (65%) managed all five CCM products used to treat three common childhood illness (pneumonia, malaria and diarrhea) in Rwanda. The results go on to show that 49% of the 208 CHWs who managed those five products

had them all in stock on the day of visit. Therefore, only about half of CHWs could provide the full range of services to treat any child who might present with one of the three illnesses.

The key gaps identified during the assessment that are influencing product availability among CHWs are:

- Product availability at the resupply point is a factor in predicting product availability at the CHW but is not the only predictor;
- No SOPs or standard formula for calculating resupply quantities for CHWs;
- Lack of basic supply chain knowledge and skills among CHWs;
- CHW supply chain data not visible at all levels of the system so unavailable for decision making;
- Insufficient storage and organization for existing drugs and supplies; and
- Lack of motivation to travel to collect supplies.

Furthermore, on asking CHWs what they perceived as their greatest challenges in managing health products, 33% responded lack of remuneration, 27% responded insufficient transport, 11% identified storage containers and storage conditions, and 3% stated stock out at the resupply point.

The supply chain for community health in Rwanda could be improved by simple interventions such as developing national procedures around reporting logistics data and resupplying health products that are based on good supply chain practices and training CHWs and their supervisors in basic supply chain skills. Other recommendations include harmonizing the quantification of all products for community health and improving data visibility through the use of mobile or information technology.

SC4CCM in collaboration with the MOH and other CCM implementing partners will explore opportunities to invest in testing supply chain innovations and best practices that specifically aim at significantly improving product availability at the community level to best support the success of the community health program in Rwanda in line with the National Community Health Policy. This baseline assessment is the starting point to identifying the obstacles and gaps in the supply chain and developing simple, sustainable and affordable solutions to test and measure what interventions have the highest potential to significantly improve supply chain system performance at this level.

## Introduction

The Supply Chains for Community Case Management (SC4CCM) project is a five-year initiative funded by the Bill & Melinda Gates Foundation. Implemented by JSI Research & Training Institute, Inc. and initiated in November 2009, SC4CCM is a learning project focused on finding affordable, simple and sustainable supply chain solutions that address the unique challenges of community health workers (CHWs)/Agents de Santé Communautaire (ASC). This baseline assessment was conducted to develop a better understanding of the existing supply chain at the community level and to inform the intervention strategy. The baseline assessment was undertaken in collaboration with the Ministry of Health (MOH) and the National University of Rwanda School of Public Health (SPH) from September 13, 2010 to November 12, 2010. This assessment was conducted in ten districts and 100 health centers out of the 21 districts in which CCM was implemented at the time of the survey.

The purpose of this report is to share the preliminary findings for the baseline assessment and to suggest possible recommendations to improve the overall performance of the supply chain (SC) for community health. The report presents the methodology used throughout the baseline assessment and the limitations encountered, provides details of findings and inputs from participants at data validation workshops (DVWs).

The key preliminary results from the baseline assessment provide an overview of all aspects of the existing supply chain at the community level from storage, transport, inventory control procedures, knowledge and skills of the staff to the regularity and content of supervision related to supply chain. Included in this report is the methodology, with the process employed in collecting data, as well as preliminary findings of the assessment and some general recommendations based on the issues identified in the assessment. Secondary analysis of the data will be done in the future and any further findings and recommendations will be shared with partners.



## Background

Community based health services have played and continue to play a significant role in Rwanda in bringing health information, services, and commodities to clients who otherwise might not have reliable access to such goods and services. Community health in Rwanda is defined as health services provided by CHWs at the umudugudu or village level. According to the Rwanda National Community Health Policy, community health is seen as a holistic and integrated approach that takes into account the full involvement of communities in planning, implementation and evaluation processes, and assumes communities to be an essential determinant of health and the indispensable ingredient for effective public health practice.

Community Case Management (CCM), or community Integrated Management of Childhood Illnesses (c-IMCI) as often called in Rwanda, is an important component of the community health policy and offers the potential to significantly increase uptake of, and access to, a variety of health commodities and services, for children under five. CCM is a strategy to deliver lifesaving curative interventions for common childhood illnesses in the community, in particular where there is little access to facility-based services (CORE Group). Targeting the conditions that cause the most child death in developing countries, CCM brings curative health care to children in those communities that are hardest to reach.

Ensuring adequate supplies are available has not always been easy or successful and anecdotal evidence suggests that one of the biggest obstacles to providing quality community based treatment is the lack of, or ineffectiveness or inefficiency of, supply chain systems necessary to ensure availability of essential medicines at this level.

Strengthening the supply chain represents an essential part of the success of community based health services in Rwanda. Community health has inherent challenges that require unique supply chain considerations, including the education level of CHWs, the location of the CHWs, and the lack of basic resources and facilities for storing and transporting products.

In response to these challenges, SC4CCM in collaboration with the MOH and other CCM implementing partners, will explore opportunities to invest in testing supply chain innovations and best practices that specifically aim at significantly improving product availability at the community level to best support the success of the community health program in Rwanda in line with the National Community Health Policy. This baseline assessment is the starting point to identifying the obstacles and gaps in the supply chain and developing simple, sustainable and affordable solutions to test and measure what interventions have the highest potential to significantly improve supply chain system performance at this level.



## Purpose of the Baseline Assessment

The purpose of the baseline assessment was to collect quantitative and qualitative data on the status of the supply chain system for CCM and other selected health products so as to:

1. Develop a better understanding of the existing supply chain for CCM and other selected health products, including the strengths in the system as well as areas that require improvement.
2. Identify factors of supply chain performance to inform the design of an intervention strategy that has the potential to significantly and sustainably improve product availability at the community level.
3. Provide baseline data to measure the impact of the supply chain interventions later in the life of the project.

The SC4CCM project is built around testing innovative supply chain solutions and moving evidence into practice; hence, the baseline data will provide a verifiable platform against which the impact of supply chain interventions in improving product availability at the community level can be objectively assessed and measured.

Monitoring and evaluation is a key component of the project and will be fully integrated into project activities from the outset. The baseline assessment will be used in the development of country-specific implementation plans and will provide a means of comparison on which to measure the impact of supply chain interventions in improving product availability at the community level.

### Theory of Change as Basis of SC4CCM Project

The project believes that access to quality health care at the community level will dramatically decrease the number of preventable deaths in children under five from the most common childhood illnesses in settings where health facilities are distant or inaccessible. We believe that CHWs, if given the appropriate training and resources, can provide high quality case management for pneumonia, diarrhea, malaria, and malnutrition in children under five. We also believe that one of the biggest obstacles to providing high quality community based treatment is the lack of, or ineffectiveness or inefficiency of, supply chain systems necessary to ensure availability of essential, lifesaving medicines at this level.

The project believes that an effective and efficient supply chain requires reliable and appropriate transport for moving goods, adequate and secure storage for maintaining good quality medicines, sufficient quantities of essential medicines available at resupply points, and staff with the right knowledge, skills, and motivation to perform their roles. To achieve these preconditions necessary for system performance certain elements must be in place. These elements are the funding, policies and strategies, tools, processes, communication and information flows, personnel with knowledge and skills needed to achieve the intermediate goal - CHWs have usable and quality medicines available when needed for appropriate treatment of common childhood illnesses. The absence of one or more of these elements will adversely affect the achievement of this goal.

Based on these beliefs, our theory is that if effective and efficient supply chain systems can be created to ensure that CHWs 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 ultimately will contribute, along with other interventions, to our overall goal to reduce childhood mortality for children under five from treatable diseases.

The SC4CCM TOC model provides the framework for our project assessment, identification of solutions and innovations, monitoring of change and demonstration of success (see Appendix A). The interventions and solutions proposed by SC4CCM to strengthen supply chains for CCM are based in the analysis of the relative strength of these system performance elements and their preconditions.

The TOC describes the pathway of change to the intermediate and ultimate goals, or long term outcomes, of the SC4CCM project. Described below are the key components that make up the pathway of change.

**Preconditions** - The preconditions are the building blocks that we believe are necessary to achieving the long-term outcomes. Each precondition is considered necessary for change to occur.

**Interventions** - Interventions are centerpiece to the theory of change as they describe the types of activities required to bring about each precondition on the pathway to change. Country specific interventions will be identified during the baseline assessment based on weak or missing preconditions.

**Indicators** - Each precondition is a preliminary outcome with indicators that measure the success of interventions adopted to achieve the preconditions.

**Assumptions** - Assumptions are the necessary factors for change that are outside the project control. These assumptions demonstrate the limitations to what we can expect to change alone and emphasize the need for collaboration with governments and partners.



# Methodology

## Qualitative Data Collection

### ***Logistics System Assessment Tool (LSAT)***

The LSAT was a two day group discussion that sought key stakeholder perspectives on aspects of the current national logistics system for CCM products. The LSAT contains questions to measure progress against once interventions commence. The tool used to carry out the LSAT was modified to capture information specifically about the community level supply chain for CCM products and for Rwanda's unique situation, so that the information obtained can effectively guide decision making. Approximately 30 participants attended, representing all levels of the supply chain. Topics included: Logistics Management Information System (LMIS), quantification, finance/donor coordination/CS planning, and transport and distribution, among others. The official language of the workshop was French. Responses and recommendations from the workshop were considered during baseline analysis.

## Quantitative Data Collection

### ***Logistics Indicators Assessment Tool (LIAT)***

The LIAT was the quantitative tool used to collect stock status and other quantifiable data of the supply chain from three system levels (district, health center and CHW). SC4CCM modified this tool to capture community level supply chain data specifically, within the Rwanda context.

The LIAT survey collected data through structured interviews with CHWs, health facility and/or warehouse staff to better understand all levels of the system. Data collection also included physically counting quantities of key CCM and other products stored at each level, assessing storage conditions, and reviewing aspects of record keeping and reporting about selected health products.

The project collected baseline data using smart phones with preset forms loaded on the phones before the start of the survey. Data was stored in copy on the phone, as well as sent to and stored in a password-protected web-based database only accessed by researchers. Data collection forms and content were all Java-based and not formatted to send over network phone lines in SMS format, so MTN, the local cellular telecommunications company, could not store or have access to data at any point in time. JSI provided a sufficient number of smart phones for data collection purposes.

JSI, in collaboration and partnership with SPH, trained data collectors to use smart phones and data collection forms through a curriculum adapted from other SC4CCM countries. Because of the number and complexity of the data collection forms, training took seven days to complete, including one and one-half days to pre-test the tools near Kigali. Additional weekend time was taken to make form revisions and revise translations.

The training and data collection activities were carried out in French, employing Kinyarwanda as needed. Nine data collection forms in total were used. Four data collection teams composed of

three to four enumerators each, plus one supervisor, carried out the work. Criterion for data collector selection was that he/she should be A1 nurses or Social assistants from SPH's experienced enumerators list.

### Sample Approach and Sample Size

The assessment facility sample was stratified by the five Provinces. Districts were considered primary units, whereas HCs with eligible CHWs (called les Agents de Santé Communautaire Binômes: ASCBs, in Rwanda) were considered secondary units. Of the CHWs volunteers in Rwanda (four assigned to each village), this particular type (ASCB or binomes) are a special group tasked with treating sick children under five years old. There are two ASCB per village (one male, one female) and both manage CCM products.

The selection criteria for districts included those where ASCB implement a full package of child health interventions (21 out of 30 districts in Rwanda). Ten of those 21 districts were selected, using probability proportional to size (PPS) random sampling methodology, based on the number of eligible ASCB per district in total. Eligible ASCB included those over 21 years of age and working in the area of child health. Likewise, HCs were sampled using PPS based on the number of eligible ASCB per HC, so the number of HCs per district also varied. Three to six ASCB were selected randomly for each selected HC depending on whether a HC was selected once or twice.

In sum, the districts and HCs were selected using probability proportional to size (PPS) random sampling method based on the number of active ASCB in those districts, and the 321 ASCB visited were selected randomly from within selected HCs.

The following numbers of sites were visited for the baseline assessment:

- Central Warehouse (CAMERWA); **n=1**
- District Pharmacies; **n=10** (selected using PPS; 1-3 pharmacies per province)
- Health Centers; **n=100** (selected using PPS; 8-17 health centers per district)
- CHWs; **n=321** (3-6 CHWs associated with each health center, chosen randomly)

At each level, data collectors carried out structured interviews, counted physical stock on hand, assessed storage conditions, and quality of information recorded and reported. Ideally, a larger sample would be used to ensure the ability to conduct tests of significance among CHWs trained in c-IMCI or CCM at the district level. However, the project was restricted to this sample size due to time and budget constraints.

Data collection lasted for about three months from September 9, 2010 to November 12, 2011.

This survey lasted longer than expected due to a list of limitations encountered, such as:

- An incomplete/out of date list of contact information for CHWs
- Health facility staff absences due to ongoing MOH trainings
- Delays in administrative and financial processes
- Dropout of some data collectors after initial fieldwork period lapsed

- Survey work spilled into the rainy season (due to delays) and difficulties were encountered reaching sites in North and West regions
- A few replacements were needed due to sites selected that were not actually active in CCM or binomes selected who had since ceased acting as binomes.

### **Data Cleaning and Data Analysis**

SPH investigators were responsible for the first phase of records inventory and data cleaning. Because they had access to the data sets first, they were best positioned to assist with cleaning and provide rapid feedback to enumerators while still in the field. The SC4CCM monitoring and evaluation team had primary responsibility for data processing, formatting and analysis, in close collaboration with the SPH.

Project staff formatted data in Excel for transfer into analysis software. Staff then analyzed data using STATA and SPSS ver. 18 software, and categorized results under the five main preconditions of the project's TOC framework. The project presented results to the national and regional level partners and stakeholders for discussion and validation at DVWs held in January 2011.

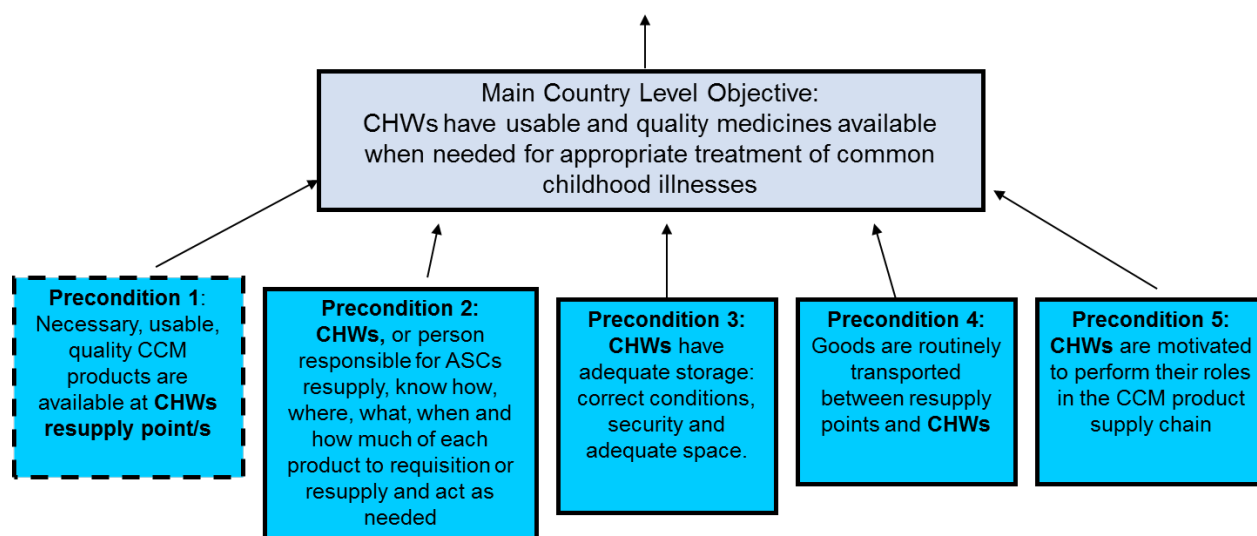


## Summary of Findings

This baseline assessment was designed to assess each of the five main preconditions of the TOC. 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 goal of ensuring CHWs have sufficient quantities of quality CCM products to treat common childhood conditions at community level when needed.

The following findings are represented in relation to the main goal objective that CHWs have usable and quality medicines when they need them, as well as the five main preconditions that are theorized as essential to achieving this objective. It should be noted that there are a number of preconditions connected to each main precondition that are considered pathways to achievement, as per TOC in Appendix A. This report presents only preliminary qualitative and quantitative data, a secondary analysis will be done in the future and results shared with partners in Rwanda.

**Figure 1: The Main Country Level Objective and Five Main Preconditions**



### **Main Country Level Objective: CHWs have usable and quality medicines available when needed for appropriate treatment of common childhood illnesses**

The assessment considered product availability on the day of visit among CHWs for key products needed to treat any of the three childhood illnesses - pneumonia, malaria and diarrhea - included under the current CCM program. As this program is still scaling up in Rwanda, only 208 of 321 CHWs surveyed managed all five products needed to treat all three childhood illnesses; Primo Rouge<sup>1</sup>, Primo Jaune<sup>2</sup>, amoxicillin, zinc and ORS, on the day of the survey

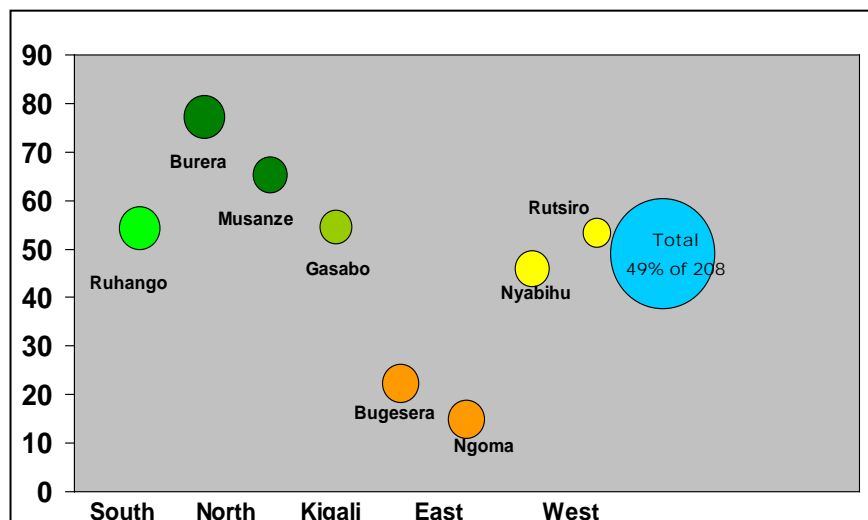
<sup>1</sup> Primo Rouge is Coartem 1x6 repackaged containing 6 tablets of artemether 20mg / lumefantrine 120mg

<sup>2</sup> Primo Jaune is Coartem 2x6 repackaged containing 12 tablets of artemether 20mg / lumefantrine 120mg

visit. Of the 208 CHWs who managed all five products, about half (49%) had all five in stock on the day of visit, and could therefore treat all three childhood illnesses at that time.

As home-based malaria treatment was implemented at community level prior to the more recent community health policy, which now also includes pneumonia and diarrhea treatments, a larger percentage of CHWs managed Primo than amoxicillin, zinc or ORS at the time of the survey. Interestingly however, the availability of amoxicillin, zinc, and ORS on the day of visit was higher overall than for the two types of Primo.

**Figure 2: Percentage of CHWs with five key drugs in stock on DOV**



In Figure 2, data show that product availability varies by district. Burera and Musanze had higher product availability on the day of visit (DOV) compared to Ngoma and Bugesera which had the lowest availability. However, trends by region (represented by color) were fairly consistent.

Interestingly, when considering the amount of

stock held by CHWs at the time of this survey, many were in fact over stocked. The ordering interval is only one month so it would be expected that CHWs keep no more than two months of stock at any time. Table 1 shows that CHWs with zinc on average had 10 months of stock, those with amoxicillin had on average almost 4 months of stock and those with ORS almost 6 months of stock. This observation demonstrates inconsistencies in how products are distributed in the supply chain for CCM products.

**Table 1: Average months of stock per CHWs**

Average months of stock per CHWs*	
Zinc (n=133) = <b>10.9</b>	PrimoR (n=88) = 2.3
Amox (n=123) = <b>3.9</b>	PrimoJ (n=80) = 2.1
ORS (n=124) = <b>5.8</b>	

\*Stockouts not included

The previous data reflects the stock levels on the DOV, but to understand the issues regarding product availability among CHWs more fully, it is important to look back at records and consider the stock out rates over the past six months. To attain this information, CHW stock cards were used as a reference; however it was found that while CHWs commonly used stock cards for stock management, an average of less than three months of data were available out of six months considered. On reviewing data available for those months, it was found that only a modest

portion (ranging from 20-40%, by product) of CHWs experienced stock outs in the prior six months (Table 2) but the duration of stock out was high when it happened, lasting between one to two months.

**Table 2: Percentage of CHWs with any stock outs recorded on stock card in past 6 months**

% CHWs with any stock outs recorded on stock card in past 6 months	
Zinc (n=184) = 24%	PrimoR (n=177) = 40%
Amox (n=186)= 22%	PrimoJ (n=169) = 39%
ORS (n=176) = 27%	

### **Precondition 1: Necessary, usable, quality CCM products are available at CHWs resupply point/s**

Product availability at the resupply point was found to be an important factor in predicting product availability at the CHWs, though not the only predictor.

Figure 3 below demonstrates that often if products were available at the resupply point, they were also available at CHWs. However, other scenarios included resupply points fully stocked but CHWs in the area stocked out (of some or all products), and the reverse with CHWs fully stocked but the resupply point stocked out. This indicates that the availability of products at the resupply point is not the only factor influencing product availability at CHWs. See Appendix B for full map of Rwanda.

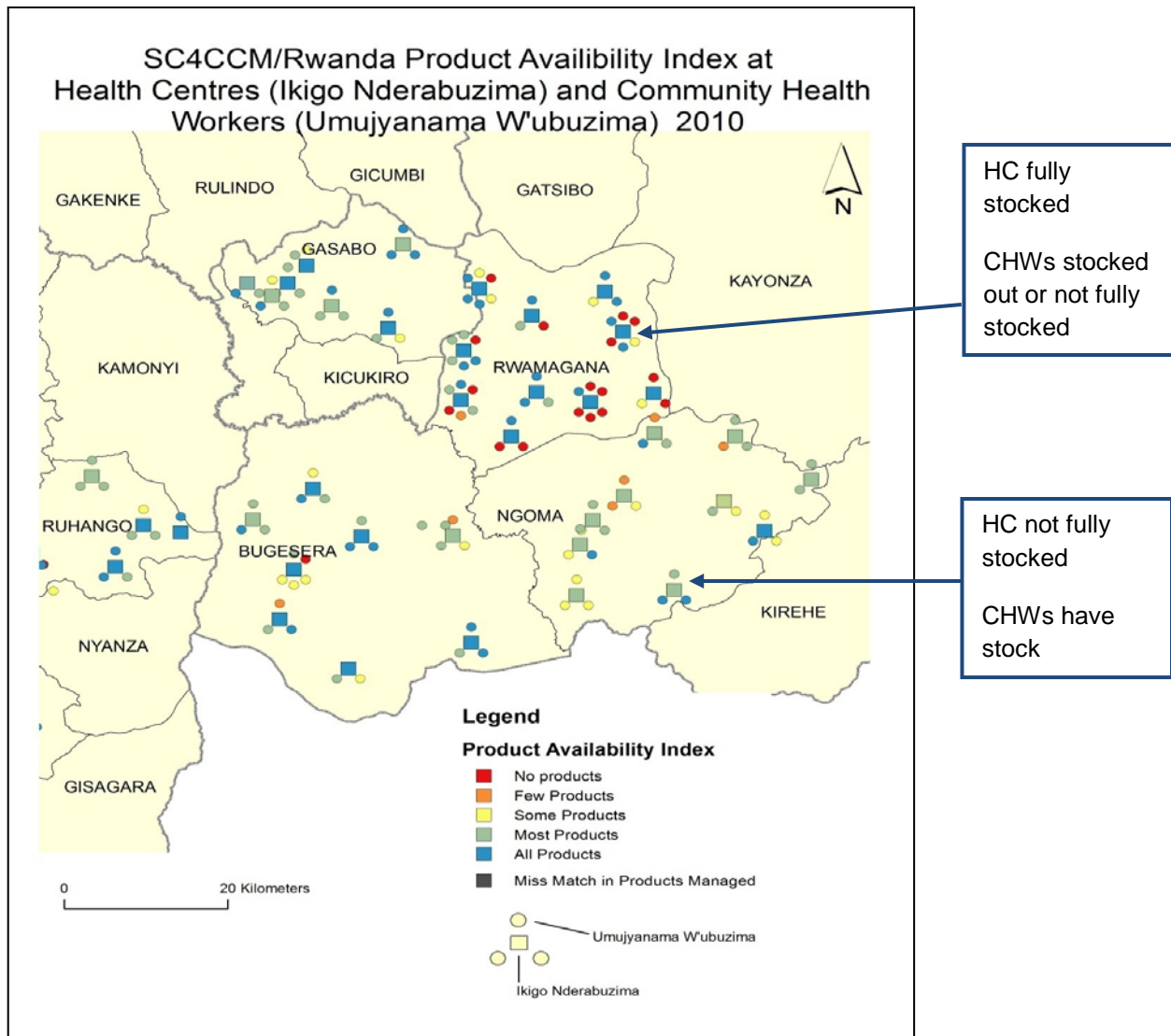
As products flow from the higher to lower level facilities, evaluations of supply chain performance must consider the whole pipeline, in this case from central warehouses down to the community. The baseline assessment therefore included product availability at both the CHW resupply points (HCs) and facilities that supply HCs (the district pharmacies). Comparing stock levels down the supply chain showed a steady decrease in product availability for five key products (ORS, amoxicillin, zinc and both Primos): 70% of ten district pharmacies surveyed had all five key products in stock on the day of visit, where 60% of the 85 health centers surveyed had them all in stock, and only 49% of CHWs had them all in stock.

During the LSAT workshop, participants indicated a number of gaps which contribute to weak supply chain at resupply level:

- Frequent stock outs occur at central level and therefore at district pharmacies, especially of both types of Primo
- District pharmacies quantify and distribute without receiving or using CHW consumption reports or quantities required
- Lack of coordination among partners and programs in coordinating quantification and procurement of CCM products. Different programs are responsible for different community health products and hence products within the same package are quantified at different times e.g. Primo is quantified by the malaria unit with the other antimalarials

whereas the amoxicillin, ORS and zinc are quantified with maternal and child health products under the responsibilities of the community health desk.

**Figure 3: Product availability between HCs and CHWs in Southern Province.**



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

An efficient and effective supply chain requires that the staff who have responsibilities to perform supply chain roles have the necessary knowledge, skills and capacity. To achieve this, it is necessary to have standard procedures clearly laid out so that staff understand what their responsibilities are, and to train them in the procedures and skills needed to perform their roles.



Therefore, to evaluate this precondition, the project considered both the existence of documented procedures and processes, and the knowledge and skills of health workers.

The findings of the assessment show that there are no standard operating procedures or standard formulas for calculating resupply quantities of health products for CHWs. When CHWs were asked if they knew how to determine their requirements, 31% said ‘do not know’, 29% said ‘someone else’ has to decide their quantities, 19% said ‘based on forms submitted’ and 4% said they request for resupply ‘whenever they are about to finish their stock’ (see table 3). On asking HC staff how they determine how much to resupply CHWs, 61% said ‘based on forms submitted,’ 19% said ‘other’ and only 4% said ‘based on a formula.’ A lack of consistency in responses from both CHWs and HC staff indicate that there are currently no harmonized procedures for determining resupply quantities for CHWs.

It is important to note the difficulty determining the amount of supply handed to each individual CHW. There are intermediate suppliers between the CHW supervisor at the HC and the CHW at the village level (such as cell supervisor or cooperative president) As the CHWs are grouped in cooperatives, they are supplied through their president and records are not kept.

**Table 3: Methods for determining resupply quantities for CHWs**

	<b>CHWs (n=321)</b>	<b>HCs (n=75)</b>
Do not know	31%	7%
Someone else decides how much to supply	29%	0%
Based on forms submitted	19%	62%
Other	16%	19%
Whenever the "last container" is opened	4%	n/a
Same as last month	2%	8%
By formula	0%	4%

The recording of stock transactions in a timely manner on stock cards is one good indication, among others, of proper stock management. The use of stock cards improves the availability and accessibility of data for decision making. On assessing stock card availability, it was found that in general a large majority of CHWs were using them: 61% of CHWs who managed Primo Rouge had a stock card for it and 60% had one for Primo Jaune; for both zinc and amoxicillin 83% of CHWs had stock cards while 78% had one for ORS and 28% had one for rapid diagnostic tests. It is important to note that on average less than three months of data were available on stock cards, suggesting it was a newly introduced initiative at the time of the survey.

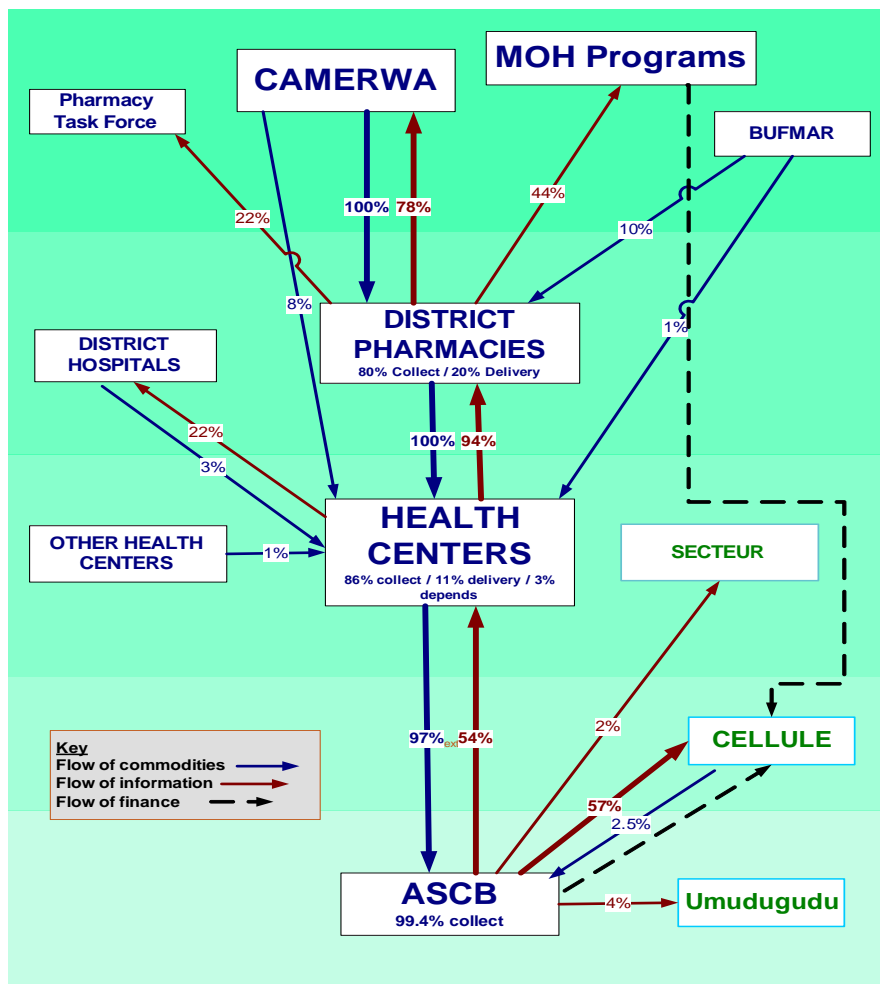
Another aspect evaluated under this precondition was how products and logistics information flow between different levels, to both establish whether distribution is streamlined and to determine if the right people have access to the right information. The results depicted in Figure 4 shows that while the flow of products is mainly streamlined, the flow of information is not streamlined nor is it aligned with the flow of products. CHWs report to multiple places, but often

not to the place from where they are getting resupplies. Therefore, information from CHWs is not available to resupply points to use for good decision making.

During DVWs, participants confirmed that logistics data is not always available at the right place to inform resupply decisions. CHW logistics data is aggregated at several levels before reaching the HC - village, cell, and secteur - and therefore the HC gets aggregated data, which means that resupply to individual CHWs cannot be informed by rate of consumption. In addition, it was also pointed out that district pharmacies rarely get information on stock on hand or consumption for CHW use.

Data visibility means data is readily available for use by those who need it, up and down the chain, from end to end. Decision makers at different levels should be able to “see” the demand and the supply (i.e. where products are). Challenges in the supply chain often occur with uncertainty about demand or supply, or when demand and supply cannot easily be aligned. Baseline data indicates that visibility of CHW data at health center, district and central level is low in Rwanda, resulting in uninformed resupply decisions which are the likely cause of stock imbalances seen in the system (over and under stocking).

Figure 4: Flow of Products and Information



### Pre-condition 3: CHWs have adequate storage: correct conditions, security and adequate space

Storage is considered a precondition for the main objective to ensure that the medicines maintain their quality and effectiveness to treat sick children. In assessing the storage situation a list of key storage conditions were identified (see Box 1) and data collectors observed whether or not these conditions were individually met.

On observing these conditions during data collection to CHWs, 16% (n=321) were observed as having insufficient storage space and 37% did not secure the storage box with a lock and key. 15% of CHWs were observed as not storing products in a clean, dry, well-lit and well-ventilated storage area. Of CHWs with stock cards and expired products (n=106), 72% did not indicate removal of damaged and/or expired products on stock cards.

When CHWs were asked whether they had received any training in storage practices, 98% of CHWs responded training in storage and 93% in first-to-expire, first-out (FEFO).

The survey also assessed the storage gaps at others levels of the system and results showed that 30% of district pharmacies and 11% of HCs do not store products on shelves or stacked off the floor. A problem for half of the districts and more than a quarter of HCs visited was that the store room was judged insufficient for existing medicines and supplies. In other words, products were either too plentiful or not organized well-enough to fit in the space available without risk of damage or expiry.

Participants during the LSAT workshop expressed that storage boxes were old, in poor conditions and could not be replaced due to lack of funds. During DVWs, CHWs reported insufficient storage space/conditions, boxes were too small for products, reports, and cash and carrying bags were not waterproof. Participants explained that those boxes were no longer adequate as the number and quantities of products had increased over time but boxes remained the same size.

#### Box 1: Storage Conditions Assessed

*Products are stored ...*

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

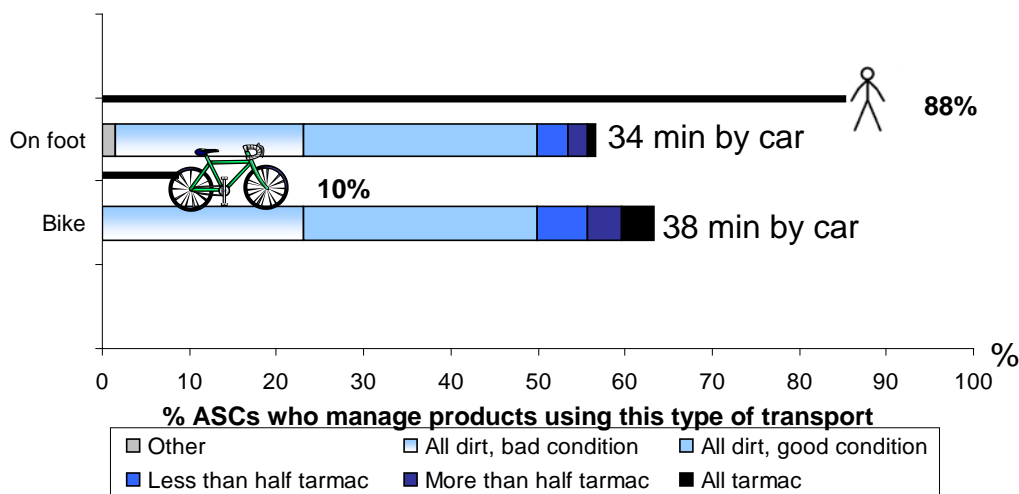
### Pre-condition 4: Transportation of products between CHWs and re-supply points

Reliable transport is one critical aspect of an effective supply chain system. As most CHWs are located in remote areas that are difficult to reach, particularly during rainy season, this challenge applies particularly to the supply chain that supports community based health services. To understand the circumstances under which the CHWs must transport supplies in Rwanda, the survey gathered information on the conditions of the roads, travel distances and types of

transport used to move products to the community. With this information, the survey can evaluate the appropriateness and reliability of the modes of transport.

In general, most CHWs reported that there were no arrangements for transportation to get to the resupply point and most CHWs travel on foot (88%), while a few had access to a bicycle (10%) and a very small proportion used other means of transport like private vehicles and public transport (1.2%).

**Figure 5: Mode of transport and distance travelled to resupply**



\*Length of bar indicates the distance an ASCs would have to travel to get to health center by car (in minutes).

\*Segments of bar indicate the proportion of ASCs using this type of transport who travel on various types of roads.

\*Line length indicates the percent of ASCs that use this type of transport.

Figure 5 above shows that a large percentage of CHWs travel on all dirt roads and many of those roads are in bad condition. The figure also shows the time it takes to travel between the CHW and the resupply point by car and therefore would take a lot longer by foot. On average CHWs reported traveling between two to three hours to and from the resupply points to collect products. The transportation challenge for CHWs is aggravated by bad roads and the distance between where the CHW lives and the resupply point.

When CHWs were asked about problems they face in collecting/receiving products, 90 CHWs (28%) reported that they did face challenges. Of those CHWs, 26% reported lack of available transport, 46% said it takes too long to get to the resupply point, and 56% said the rainy season was another problem.

At the DVWs, CHW participants expressed that their greatest challenge is traveling long distances with no compensation to pay for a bike or motorcycle ride, and having to pay out of pocket when they need one. It was further stated that the challenge of transportation sometimes results in stock outs at CHW level when they can't find means to get to the resupply point for more products.

## **Pre-condition 5: CHWs are motivated to perform their roles in the CCM product supply chain.**

Health worker motivation to perform their supply chain roles is a complex and multi-factorial issue yet essential to a functioning system. Due to the complexity of the issue and the broad scope of this assessment, findings available on the subject are limited in their ability to fully describe factors that motivate CHWs. Specifically, this survey collected information on supervision and feedback as sources of motivation and asked respondents to rank their level of job satisfaction and provide some insight into what motivates them to do their job.

In spite of the challenges that CHWs face, many indicated satisfaction with their job. When asked what motivates them to perform their roles, the majority responded that they are motivated by building social relationships, trust and esteem from neighbors (47%) and by being able to save children's lives/help communities (27%). See Figure 6 for other responses mentioned.

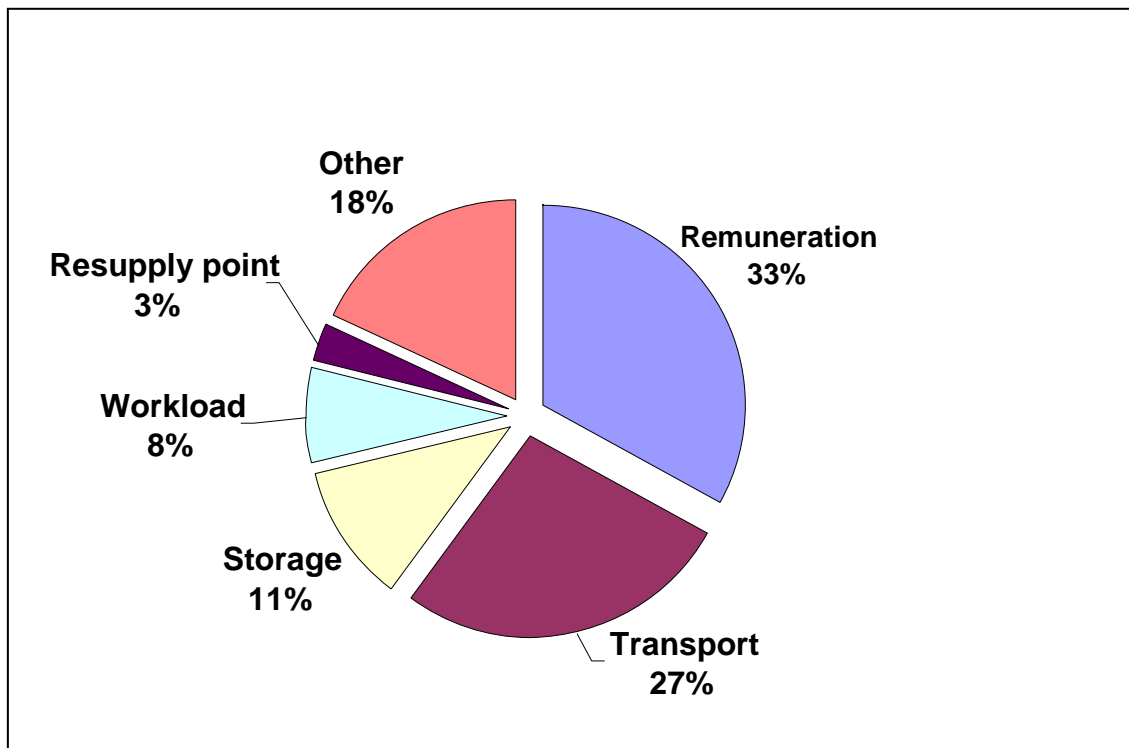
Even though the CHWs interviewed did not mention supervision as a source of motivation, the health field considers well-conducted supervision to be a motivating factor for workers. Through conversation with CHWs many reported that if they receive feedback on what they are doing they are encouraged to put forth more effort and improve. The findings from this survey indicate that in Rwanda a health center level supervisor oversees an average of 88 CHWs. Given the transport constraints and bad road conditions in most areas, the difficulty of trying to visit each CHW at their home regularly to view products and forms and give feedback emerges. Yet, these are the requirements for effective supervision on supply chain topics. Therefore, although this assessment finds that supervision takes place at least once a quarter for 90% of CHWs, it remains questionable whether the frequency or quality is enough to make a difference in health worker motivation to perform supply chain tasks.

When CHWs were asked what they would consider as their main challenge to managing health products 33% said lack of remuneration, 27% said lack of transport, and 11% said lack of adequate storage space. Figure 7 outlines all the challenges reported. Another problem raised during DVW related to challenges was the lack of any mechanism to communicate about stock status between CHWs and resupply points.

Figure 6: Motivating factors for CHWs to do their job



Figure 7: Greatest challenges to managing products



## Recommendations

The following preliminary recommendations are based on data collected during the SC4CCM baseline assessment and validated through DVW. They are proposed for consideration by MOH and other partners supporting the implementation of CCM or c-IMCI.

**Challenge:** Product availability at the resupply point and throughout the national pipeline is a factor in predicting product availability at the CHW level

**Recommendation:** Conduct annual quantifications that consider and clearly reflect the specific needs of CCM. As the program is still growing, it is important to clearly understand the needs at the community level. The result of these quantifications should be used to plan for procurement and to identify gaps in funding for CCM commodities so as to advocate to donors and development partners, as well as policy level government staff on the level of funding required to procure enough products to fill the national pipeline for CCM products. In addition, the quantification results should be used to monitor the national stock status throughout the year so that action can be taken as necessary to prevent potential stock imbalances.

Quantification of all key CCM products should be integrated so that the full package of community health products are considered together to ensure that the specific program needs are fully accounted. Currently only ORS, zinc and amoxicillin along with other nutrition products for the CHWs are being quantified and procured at the same time whereas Primo Rouge and Primo Jaune are quantified separately. In the assessment availability of antimalarial products was lower than for other community health products.

**Challenge:** No standard operating procedures (SOPs) or standard formulas for calculating resupply quantities exist for CHWs.

**Recommendation:** Develop SOPs that outline roles and responsibilities, the flow of products and information, frequency of resupply and reporting, what data should be reported and when and how the health center should calculate resupply for CHWs. Developing a standardized tool for CHWs logistics data reporting will be very crucial to ensure data is available and used for correct calculation of resupply quantities and making sure CHWs and HC staff understand their roles in maintaining adequate stocks of CCM products.

**Challenge:** Poor visibility of CHWs logistics data at HC and district pharmacy for making supply chain decisions

**Recommendation:** Improve the recording of logistics data by CHWs and ensure that reports containing logistics data are regularly submitted to the person responsible for making resupply decisions. Those responsible for managing health products at central, district and HC levels need to have access to CHW consumption data to ensure adequate stock levels of community health products are maintained at national, district and lower levels. Different levels require different representations of the same data; district level will only require aggregated consumption data while health centers may require individual or cell level consumption data. The use of mobile or information technology may be useful in enhancing data transmission and improving data visibility throughout the supply chain.

**Challenge:** Lack of basic supply chain knowledge and skills among CHWs and their supervisors

**Recommendation:** CHWs and their supervisors need to be trained on basic best practices in supply chain management such as correct storage, recording and reporting of logistics data and their responsibilities in collecting supplies. Training supervisors in supervision of supply chain management will enable them to identify and address supply chain issues during supervision that reinforce what CHWs have learned. Continuous training and supportive supervision are important non-financial incentives that can be employed to motivate CHWs.

This survey did investigate the quality of supervision to CHWs however conversations with CHWs identified that more feedback would motivate them in their roles. Further investigation into the quality of supervision may provide more insight into how supervision can be improved to support CHWs in their roles in the community.

**Challenge:** Insufficient storage and organization for existing medicines and supplies

**Recommendation:** Storage boxes were reported as insufficient to keep safe all the medicines and reporting books that the CHWs must hold. It is important to determine whether additional boxes need to be issued or newer, bigger, sturdier boxes put into place so enough space is provided to store products at a maximum level. Supplying CHWs with some other kind of container for storing documents and allowing the drug boxes to be used for their original purpose may also result in improved storage conditions for CCM products. It was also reported that many boxes were in disrepair due to water damage or through years of use and as a result current boxes need to be repaired or replaced. In addition water-resistant carrying containers for resupply and outreach are also needed.

In addition to improving the infrastructure for storing health products providing CHWs with basic training on good storage practices will also improve how products are stored in the community.

**Challenge:** Motivation of CHWs to perform their SC roles especially regarding traveling to collect supplies

**Recommendation:** CHWs not traveling to the HC to collect supplies due to no incentives or reimbursements was identified in the assessment and confirmed in DVWs as a major barrier to product availability at the community level. As it is not sustainable to introduce a system for remuneration of 60,000 plus CHWs, it is necessary to find a way to recognize or provide non-financial incentives that motivates CHWs to perform supply chain roles such as traveling to the HC to collect supplies. During the baseline assessment CHWs identified being held in high regard by their community and saving children's lives as the most common motivating factors. As products are necessary for CHWs to serve their communities, an incentive and recognition system that links the importance to maintaining adequate stock levels to serving the community could work to motivate CHWs to travel to the health center to restock. In addition the recognition and incentive system must extend to health center staff who also must maintain adequate supplies of CCM products if they are to resupply the CHWs.

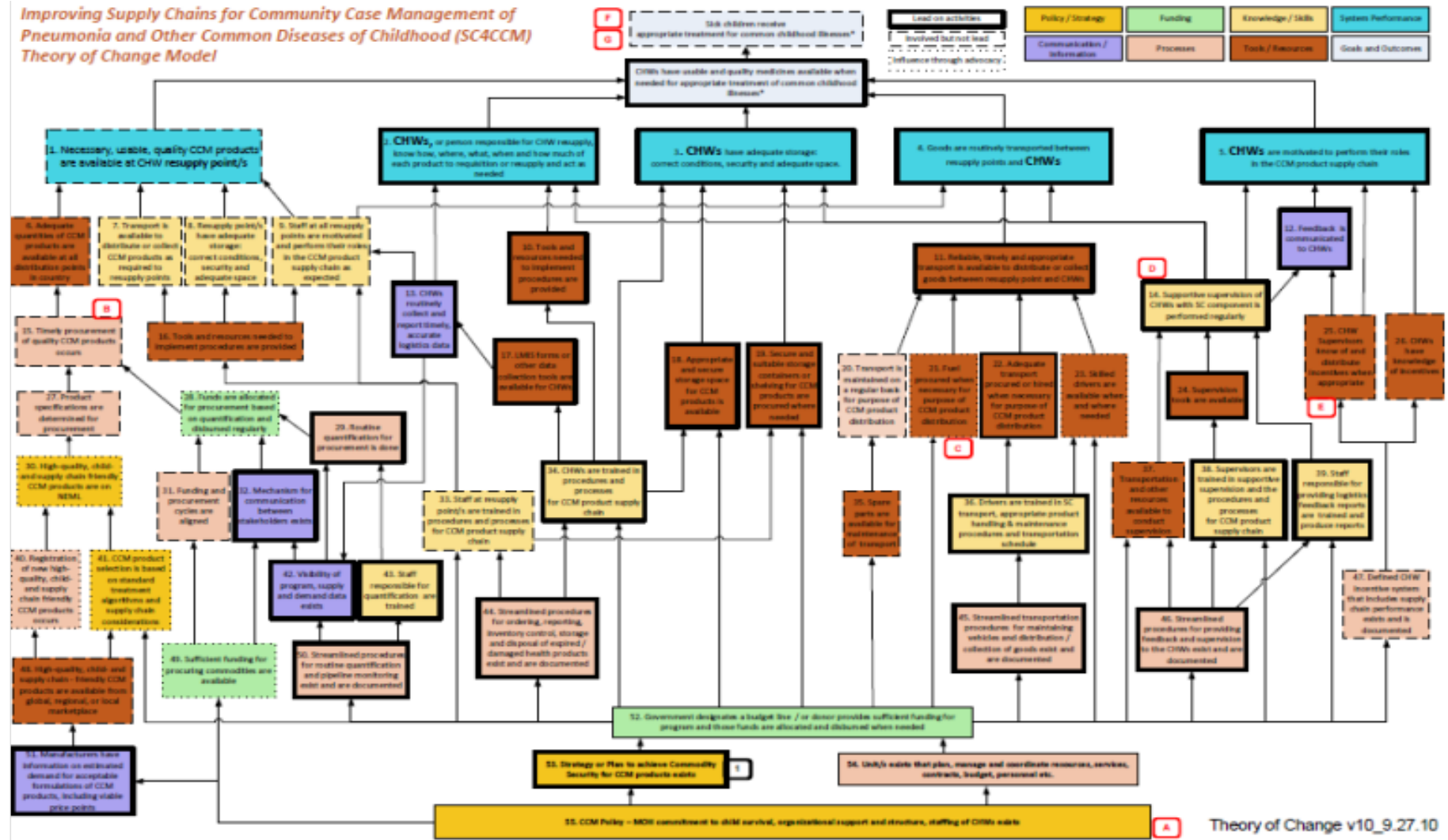
Linking recognition or incentives to the performance based financing may be one possibility as improved performance would result in increased dividends for the members (CHWs) of the



cooperatives, and since this would in turn motivate individual CHWs to maintain supplies so they can serve patients. Other possible motivating techniques include refresher training and educational and supportive supervision. Monthly meetings between CHWs and their health center supervisors are another avenue for motivating CHWs. If local authorities are able to attend such meetings then some of the initiatives being raised could easily be understood and supported by the authorities.



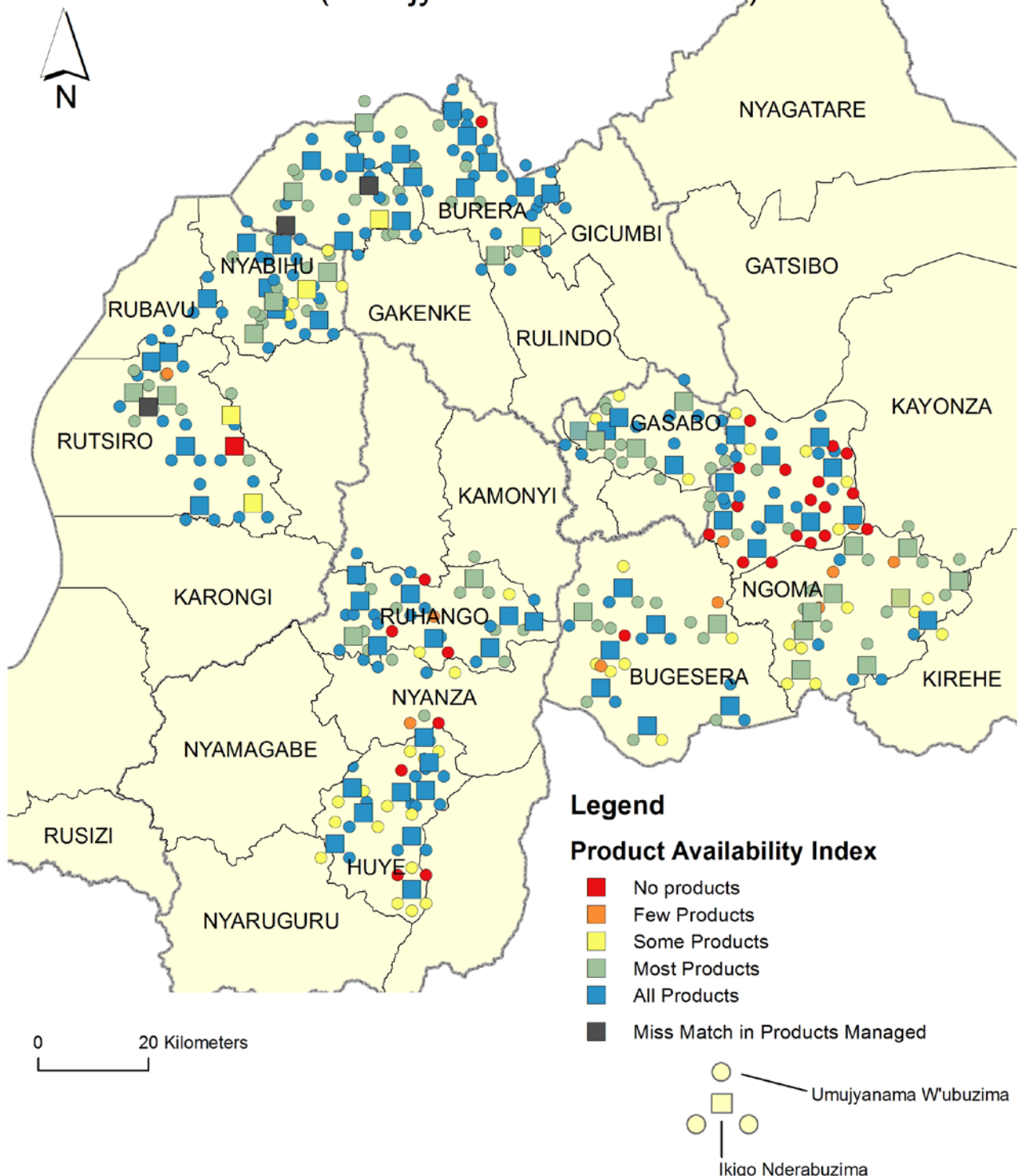
# Appendix A: SC4CCM Theory of Change





## Appendix B: Product Availability Map of Rwanda

SC4CCM/Rwanda Product Availability Index at Health Centres (Ikigo Nderabuzima) and Community Health Workers (Umujyanama W'ubuzima) 2010





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