USAID | DELIVER PROJECT

Zimbabwe: System Design for Malaria Products for Community Health Workers

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Zimbabwe: System Design for Malaria Products for Community Health Workers

USAID | DELIVER PROJECT, Task Order 3
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Abstract
In September and October 2011, the Ministry of Health and Child Welfare, with technical assistance from the USAID | DELIVER PROJECT, Task Order 3, conducted an assessment of the procedures for supplying community health workers with malaria products. Based on the findings of this assessment, a workshop was held where the participants designed the flow of commodities and information, including any forms that might be needed. This report presents the findings of the assessment and the proposed resupply procedures for community health workers to use when distributing malaria products.

Cover photo: Community health workers (CHW) gathered for a CHW focus group interview at Maramba Clinic, Mutawatawa, Zimbabwe, on September 30, 2011. The information captured during the interview informed the design of CHW resupply procedures for malaria products at the community level.

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Acronyms

ACT	artemisinin-based combination therapy
AutoDRV	automated Delivery & Receipt Voucher
CBD	community based distributors
CHW	community health worker
DFID	Department for International Development (UK)
DPS	Directorate of Pharmacy Services
DTTU	Delivery Team Topping Up
EHT	environmental health technician
EOP	emergency order point
GFATM	Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria
HBC	home-based caregiver
HMIS	health management information system
IPTp	intermittent preventive treatment (of malaria) in pregnancy IRS
JSI	John Snow, Inc.
LLIN	long-lasting insecticide-treatment bed net
LMIS	logistics management information system
MOHCW	Ministry of Health and Child Welfare
NMCP	National Malaria Control Program
OI	opportunistic infection
ORS	oral rehydration salt
PEDCO	Provincial Epidemiology and Disease Control Officer
PHCP	primary health care package
RDT	rapid diagnostic test
SDP	service delivery point
SOH	stock on hand
TB	tuberculosis
UNDP	United Nations Development Program
USAID	U.S. Agency for International Development

VHW	village health worker
ZEDAP	Zimbabwe Essential Drugs Action Programme
ZIP	Zimbabwe Informed Push
ZNFPC	Zimbabwe National Family Planning Council

Executive Summary

The Ministry of Health and Child Welfare (MOHCW), recognizing that trained community health workers (CHWs) can treat uncomplicated malaria at the community level, are committed to increasing their participation in providing equal access to malaria control interventions. The MOHCW planned to train 5,400 CHWs on community case management of malaria by December 2011; the training on logistics would be integrated with the case management training.

The MOHCW requested technical assistance from the USAID | DELIVER PROJECT to review current resupply procedures for CHWs, develop design options based on the review, facilitate a participatory workshop and reach consensus on one of those design options, and develop related standard operating procedures and training curriculum based on the design.

At the design workshop, two basic resupply models were presented: CHWs could either be resupplied directly by the Zimbabwe Informed Push (ZIP) delivery teams, or the service delivery points (SDPs) could resupply them. Both design option have several variations. After much discussion, the group agreed that the SDPs should directly resupply the CHWs. In many ways, CHWs are regarded as another stockholding unit of the SDP, similar to the dispensary, storeroom, and wards.

In the developed system, CHWs use a CHW rapid diagnostic test (RDT)/Coartemether Register to record the number of RDTs, the number of positive test results, the quantities of artemisinin-based combination therapy (ACTs) dispensed, and the number of referrals. They also use the register to record their stock on hand (SOH). CHWs take this register to the SDP when they have their monthly meetings. SDP staff use consumption and SOH information to calculate resupply quantities. The register also records the CHW's receipt of commodities. At the end of the meeting, the CHW returns home with the register and the resupply.

The design team felt strongly that the stocks held by CHWs should be accounted for when the ZIP delivery teams calculated resupply for the SDP. Staff at the SDP use the SOH information from the CHW RDT/Coartemether Register to record the stocks on hand for each CHW on a new form: the Stock on Hand at Community Level form. They provide this information to the ZIP delivery teams, who then record the stock information on the ZIP AutoDRV Facility Worksheet.

The logistics management information system (LMIS) forms and standard operating procedures will be incorporated into the MOHCW's *Guidelines for Management of Malaria in Zimbabwe: Home and Community Level*. The training curriculum that was developed will be merged into existing training materials. Critical to the success of the CHW program is to secure the funding for printing the forms, guidelines, and training materials.

Background

Approximately 50 percent of the population of Zimbabwe is at risk for developing malaria, which is the third most common cause of illness and death, accounting for 30 percent of the outpatients at clinics. Annually, there are about 1.5 million malaria episodes, and 1,000 deaths from the disease. Malaria transmission is seasonal—it starts in November and peaks from mid-February through to April/May. However, the transmission pattern varies from district to district. Out of a total of 62 districts (not including Harare and Bulawayo), 45 are affected by malaria.

From 2004 to 2007, there was a marked decline in malaria incidence; however, it is unclear whether this resulted from intensified malaria control interventions or other factors, such as a weakened surveillance system and poor reporting. The Ministry of Health and Child Welfare (MOHCW) of Zimbabwe developed the *National Malaria Prevention and Control Policy* and the *"National Malaria Control Programme Strategy* that outline the malaria interventions the government is undertaking. The goal is to reduce malaria-specific morbidity and mortality by 50 percent by 2010, another 30 percent by 2015, and another 20 percent by 2025.

The areas of intervention are—

- vector control (including indoor residual spraying [IRS], distributing long-lasting insecticide-treated bed nets [LLINs], larvicide, and environmental management and manipulation)
- intermittent preventive therapy in pregnancy (IPTp)
- case management (including diagnosis and treatment)
- epidemic preparedness and response
- operations research
- surveillance
- monitoring and evaluation
- behavior change communication.

In 2004, following widespread resistance to chloroquine and sulfadoxine/pyrimethamine, the MOHCW changed its malaria treatment policy to artemisinin-based combination therapy (ACT) using arthemether/lumefantrine, a more efficacious medicine for treating uncomplicated malaria. However, this change in treatment was not implemented until 2007. The MOHCW also has a policy that says all suspected malaria cases should be confirmed with rapid diagnostic tests (RDTs) and/or microscopy before patients receive artemether/lumefantrine.

To maximize universal access to malaria control interventions, the MOHCW is committed to strengthening community participation. The MOHCW recognizes that trained community health workers (CHWs) or village health workers (VHWs) can treat uncomplicated malaria at the community level when access to conventional medical facilities is not readily available. Toward this end, the MOHCW drafted the *Guidelines for Management of Malaria in Zimbabwe: Home and Community*

Level, a document that guides community health workers in diagnosing, treating, and referring malaria cases. The guidelines state that CHWs who have been trained on community case management of malaria can administer ACTs if the patient has a positive RDT test.

According to the Zimbabwe Malaria Treatment Guidelines, Coartemether (brand name Coartem) is the standard treatment for uncomplicated malaria. It comes in four presentations of 1x6, 2x6, 3x6 and 4x6 tablets as a special design for ease of use in the public sector.

The following groups are trained to treat malaria in the community:

- village health workers
- school health masters
- malaria drug holders
- home-based caregivers.

These groups fall under a broad category known CHWs. All cadres are community members that provide basic health and medical care to their communities. Training provided for these cadres is variable depending on their specific health area of focus and MOHCW NMCP training schedules. The words CHW and VHW are used interchangeably in the document to reflect the appropriate name they are referred to in that section/context.

The MOHCW plans to train 5,400 CHWs on community case management of malaria by December 2011. Training on the logistics system will be integrated with training on case management. The ministry has put in place an interim system and tools for managing ACTs and RDTs at the community level; they asked the USAID|DELIVER PROJECT for technical assistance to assess and redesign the logistics system for ACTs and RDTs for the CHWs.

Several departments within the Ministry of Health are involved with designing and implementing malaria control interventions, including the—

- National Malaria Control Program (NMCP)
- Directorate of Pharmacy Services (DPS)—acts as a service department to programs
- Logistics Sub-Unit (LSU)
- Directorate of Laboratory Services
- Environmental Health
- Directorate of Nursing Services.

Overview of the Zimbabwe Informed Push

In 2009, the MOHCW with technical and financial support from the United Nations Development Programme/Global Fund to Fight HIV/AIDS, Tuberculosis and Malaria (UNDP/GFATM); the USAID|DELIVER PROJECT; and the Department for International Development **(**DFID) rolled out the Zimbabwe Informed Push (ZIP) system for distributing malaria and tuberculosis (TB) medicines, and primary health care packages (PHCPs). The ZIP/PHCP system is modeled on the Delivery Team Topping Up (DTTU) system, which the Zimbabwe National Family Planning Council (ZNFPC) manages. Deliveries are made to every public sector health facility once a quarter.

For malaria and TB medicines and medical supplies, facilities are topped up to their maximum stock level. The ZIP system has brought a steady supply of TB and malaria medicines and medical supplies to hospitals and health centers across the country.

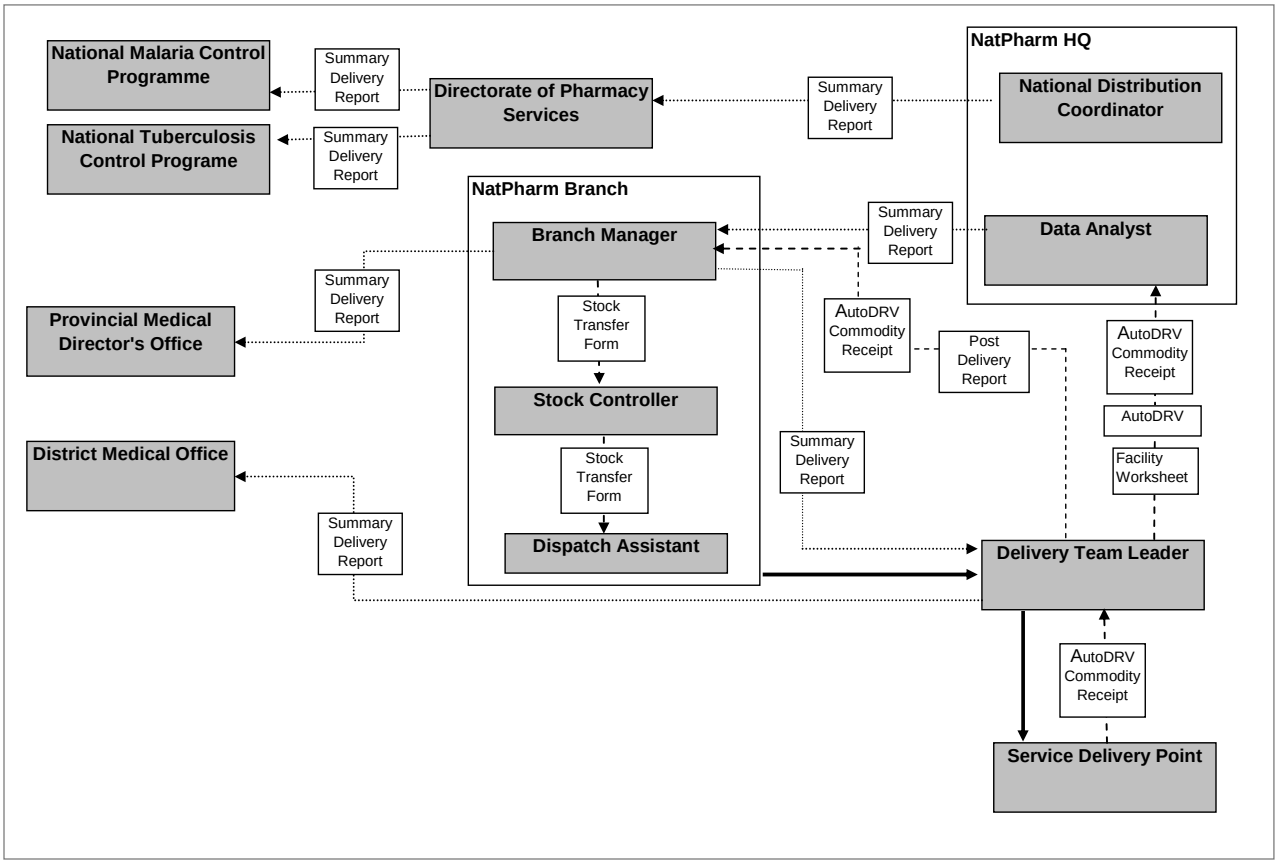
The ZIP/PHCP system functions well if the managed products are available in full supply. A full supply of these commodities in the system ensures that each SDP can be resupplied to its established maximum stock level and it will not stock out before the next scheduled delivery. For more information on the ZIP/PHCP systems, refer to the *Standard Operating Procedures Manual for the Management of the Zimbabwe Informed Push (ZIP) System for Tuberculosis and Malaria Commodities & Primary Health Care Packages (PHCP).*

The ZIP/PHCP distribution system has two tiers—the central level (NatPharm branches) and the service delivery point (SDP) level. Malaria and TB commodities are supplied from the NatPharm warehouses in Bulawayo, Chinhoyi, Harare, Gweru, Masvingo, and Mutare. See figure 1 for a graphic representation of this flow of commodities and information.

District teams deliver products to every SDP in their respective districts, once a quarter. Each district team has a District Pharmacy Manager (who is the Delivery Team Leader), the NatPharm dispatch assistant, and a truck driver. The delivery team counts stock at each facility and asks the staff about losses of and adjustments to stock. The team also reviews storage of the commodities at each facility to ensure they are following good storage practices. The team leader, who makes a series of simple calculations using an automated Delivery & Receipt Voucher (AutoDRV), determines the quantities of malaria commodities required at each site. SDPs do not routinely place orders for the products included in ZIP/PHCP, but they can place emergency orders, if necessary.

When the delivery team arrives, an SDP should have approximately three months of stock of each product remaining. Because there is zero lead time at the SDP level in the ZIP/PHCP system (i.e., the order is filled on the spot after the requirements are calculated), the safety stock level at the SDP is the same as the minimum stock level (three months). At the SDP level, the emergency order point (EOP) is a one-month supply, which allows enough time for SDP staff to place an emergency order with the District Pharmacy Manager and receive commodities before stocking out.

Figure 1. ZIP/PHCP System Flow of Commodities and Information



Scope of Work

Using short-term technical assistance (STTA), the MOHCW DPS and the NMCP were able to assess and redesign the logistics system for CHW and to develop standard operating procedures (SOPs) and training curriculum for the revised system.

The following activities/tasks were completed:

- Prior to trip—level of effort (LOE) of five days to review background documents and tools.
- Conduct briefing with the USAID|DELIVER PROJECT country director, MOHCW, and the U.S. Government (USG), as requested.
- Conduct an assessment of the interim logistics system, including resupply and storage procedures, LMIS tools for managing ACTs and RDTs at the community level, and how these relate to the ZIP LMIS. The strengths and weaknesses of the system were clearly outlined.
- Make recommendations for adjusting the system to the country program context; with national stakeholders, present and discuss possible options.
- Develop SOP manual and training curriculum for the revised system.
- After the trip—LOE of 10 days to finalize technical deliverables.

Methodology

Review of Technical Documents

The consultants reviewed background technical documents, including the *National Malaria Prevention and Control Policy* (October 2010), *Guidelines for Management of Malaria in Zimbabwe: Home and Community Level* (December 2009), *National Malaria Control Programme Strategy (2008–2013)*, *Guidelines for Management of Malaria in Zimbabwe: Diagnosis, Management of Uncomplicated and Severe Malaria* (December 2009), and *VHW RDT/Coartemether Register*.

Interviews with Central-Level Staff

The team conducted interviews with the central-level staff, including staff from the NMCP, DPS, and staff involved with managing data from the DTTU system. A questionnaire was developed to guide the interviews conducted at the central level (see appendix A).

Site Visits

The NMCP arranged for site visits to SDPs and the CHWs they serve. Two teams conducted site visits; each team included one consultant and one member of the NMCP. In Mashonaland East, the Provincial Pharmacy Manager (PPM) also accompanied the team. A questionnaire was developed for SDP staff and a separate questionnaire was developed for the CHWs (see appendix B for these questionnaires). At some SDPs, the CHW staff were present at the SDP; for other SDPs, the team traveled to the CHW's home. The team visited the following SDPs:

Table 1. Site Visits

Team	Province	District	Facility
1	Mashonaland West	Siakobvu	Mola Rural Health Centre
			Kanyati Rural Health Centre
2	Mashonaland East	Murewa	Murewa District Hospital
		Mutoko	Katsukunya Clinic
			Mutoko District Hospital
			Chikondoma Clinic
		Mutawatawa	Maramba Clinic
			Mashambanaka Clinic
			Mutawatawa District Hospital

Develop Options for System Design

After the field visits, the team consolidated the data and documented the findings. The team developed different options for the system design. The two basic options were (1) the ZIP delivery team resupplies the CHWs, or (2) the SDP resupplies the CHWs.

Design Workshop

A participatory design workshop was held on October 5, 2011, at the Holiday Inn in Harare (see appendix C for the agenda). There were 16 participants (see appendix D). During the workshop, the findings and the options for the system design were presented. Participants were divided into small groups and each small group selected the design option they considered the best. They listed the advantages and disadvantages for that option, the forms the SDP and CHW would use, the frequency of resupply for the CHWs, and the amount of buffer stock the CHWs should hold. Each small group then reported to the larger group for discussion. The consultants facilitated the discussion and helped the group reach consensus on the recommended design option.

Presentation of Recommendations

The MOHCW held the Annual Malaria Conference 2011 from October 10–14, 2011, in Mutare. One session was dedicated to the CHW program. The consultants presented the findings and proposed designs as part of this session. The stakeholders generally approved of the design. The design was discussed during a resolutions meeting at the end of conference, where it was officially approved. An implementation plan was developed for rolling out the system.

Findings

Central-Level Findings

The NMCP policy and strategy documents specifically mention the importance of strengthening the role of the community in malaria control efforts. The target is to have a total of 5,400 CHWs nationwide; 120 CHWs in each of the 45 malaria endemic districts. The role of CHWs in malaria is significant; NMCP estimates that CHWs serve 15–25 percent of malaria cases (in malaria districts). NMCP plans to train all CHWs and the nurses/supervisors of CHWs. Their goal is to expand the numbers of CHWs, which would increase the coverage, but the current training budget for training supported by Global Fund is not adequate.

NMCP recently developed a new CHW RDT/Coartemether Register but they are receptive to revisions. However, they want an uncomplicated form for CHWs. To date, some CHWs have been trained how to use the new register. CHWs should keep their supplies with them: all ACTs; RDTs; and the supplies needed for RDTs (gloves, sharps boxes, cotton swabs, etc.). All SDPs should receive products from ZIP; however, some may receive them directly from donors.

The central level wants the community level to provide both case data and consumption data. They need to know the difference between what is consumed at the community level and what is consumed at the facility level. They envision a national system where resupplying CHWs is standard. Guidelines for supervising CHWs should be developed; waste management is an integral part of the system.

The team reviewed all the health management information system (HMIS) forms that contained some data on CHWs and malaria. These forms are outlined in table 2.

Table 2. Forms That Contain Village Health Worker and Malaria Data

	Form	Completed by	Purpose
1	VHW record card*	*Issuing officer* at facility—nurse, pharmacist, etc.	To issue products from the facility to the VHW; to provide proof of receipt to the VHW
2	VHW register (Mash west only?)	VHW	To record number of malaria cases and other diseases/conditions, quantities of products distributed, stock on hand
3	VHW monthly return form (Mash west only?)	VHW	To summarize the information on the VHW register
4	CHW RDT/Coartemether register (not yet rolled out nationally)*	CHW	To record the RDTs conducted and quantities of ACTs distributed, and the number of referrals.
5	T3*	Nurse (facility)	(Tally sheet) To record the number of cases of suspected malaria, cases tested by RDT or slide, confirmed cases

	Form	Completed by	Purpose
6	T5*	Nurse (facility)	To report on the number of cases of suspected malaria, cases tested by RDT or slide, confirmed cases (tested +) To report on the quantities of ACTs dispensed
7	T6*	Nurse (facility)	(Tally sheet) To record the number of patients given IPT1 and IPT2
8	T12	Nurse (facility)	Improvised form that captures quantities of ACTs dispensed

Table 2 does not include any of the forms that are part of ZIP, because ZIP does not hold specific information on the community level. However, the ZIP team does use SOH data to calculate consumption; consumption data is also reported through the HMIS. Central-level staff reported that malaria data through the HMIS has been inconsistent.

Site Visit Findings

As mentioned in the methodology section, staff visited nine facilities in two provinces: Mashonaland West and Mashonaland East. Some findings were the same for both provinces. CHWs live between 2–30 kilometers from the facilities that resupply them. Though the MOHCW has plans to harmonize and roll out standard training for CHWs, at the time of the assessment, the training of CHWs is variable: some CHWs have been trained but others have not; some clinics have been trained on how to supply CHWs, while others have not. Some CHWs also manage other products, such as oral rehydration salts (ORS), aqua tabs, gloves, topical antiseptics, bandages, paracetamol, condoms, and contraceptives. Nurses supervise the CHWs. There was no leakage reported at the community level.

Mashonaland East

Seven facilities were visited in Murewa, Mutoko, and Mutawatawa districts. Staff interviewed the principal medical laboratory scientist, laboratory technician, district pharmacy manager, pharmacist, nurse's aide, and nurse. In these districts, some CHWs have been trained on the program and the new CHW RDT/Coartemether Register; they stated that the new register was easy to complete. However, CHWs do not have malaria products yet as they are waiting for the resupply system to be designed. Because they are not currently managing malaria products, they receive refresher training at clinics by administering RDTs to real patients.

The team of trainers should have included the district nursing officer (DNO), district medical officer (DMO), nurse, lab scientist, and pharmacist. However, often, the pharmacist was not part of the team. For better community coverage, nurses requested that more CHWs be trained on managing malaria products. There is a funding gap for CHWs in Mutoko district—the Global Fund only funded 120 of the 125 CHWs. The district hospital is exploring the possibility of using the hospital's Health Services Fund to pay for training the other five.

Some CHWs implemented the previous malaria CHW program—they distributed Fansidar, chloroquine, and paracetamol in their communities. The program ended in 2009 when the malaria treatment policy switched to using ACTs, and required a positive RDT before receiving treatment. In the old system, the resupply of malaria products was done monthly. CHWs recorded in an

exercise book what they dispensed and submitted during the month to the facility. They also brought back stock to the facility for a physical count. The quantity resupplied was fixed at 100 tablets per month for each product. If they stocked out during the month, they returned to the clinic for resupply. CHWs assume that the new system will be similar to the old system.

CHWs may not have the same resources: some have weight scales, some have digital thermometers, and some have carrying bags (donated by UNDP/Global Fund). None of the CHWs interviewed had bicycles, but a few in the community did (donated by Save the Children). Most CHWs travel to the clinics on foot and a few use commuter buses. Some are home-based caregivers and some provide TB, opportunistic infections (OI), and maternity follow up.

Home storage kit for malaria commodities to ensure proper storage management.

CHWs seemed to know about proper storage and waste management guidelines. At the training, all CHWs were given kits for home storage. They were not given sharps boxes but were told to improvise and create their own, which they were to return to the clinic when it was full. They were told to burn gloves or dispose of them in Blair toilets (similar to a septic tank pit and developed in Zimbabwe in 1970). Most knew that expired products should be returned to clinics.

Generally, stock of Coartem® and other products (such as cotton swabs and gloves) were acceptable. One facility had a stockout of RDTs, but the others had a good supply. Clinics are aware of ZIP, but reported delayed deliveries. Consumption data is coming through the HMIS and LMIS. Interviewers noted data missing in the HMIS that some departments, such as pharmacy and outpatient, did not report. As a result, the HMIS is under-reporting consumption data.

Monthly meetings are held between CHWs and nurses at the facility. In larger facilities, two separate departments resupply CHWs: laboratories (for RDTs) and pharmacy (for ACTs). In smaller health facilities, the nurse resupplies the CHWs.

Some elements that CHWs highlighted as critical for the success of the program include providing bicycles, a full supply of products, and more incentives (increased allowance, transport reimbursements, uniforms, t-shirts). They suggested that during resupply the number of gloves dispensed should be the same as the number of RDTs dispensed to ensure that they do not run out. Their general preference is to maintain monthly resupply, because they already have monthly meetings. However, home-based caregivers (HBC) are resupplied twice a month: at the beginning and at mid-month. CHWs indicated that they would like a booklet/manual written in Shona and English, that has information about the RDT test and the ACTs because they did not receive the *Guidelines for Management of Malaria in Zimbabwe: Home and Community Level* during training.

[Left to Right] Project driver, Nurse aid, Malaria Focal Person, Provincial Pharmacy Manager and Community Health Worker, standing at a Community Health Worker's homestead in Mutoko District.

Nurses would like to use a new/revised form for CHW resupply and stock cards where they can record quantities issued to CHWs. Some facilities have an environmental health technician (EHT) that nurses stated should play a role in supervising CHWs, because

EHTs go into the communities; they had this role in the old system.

Mashonaland West

In Mashonaland West, the team visited two facilities: Mola Rural Health Center, which has eight VHWs; and Kanyati Rural Health Center, which has 31 VHWs. At these facilities, nurses comprised the staff, so the team interviewed that group. For two years, Mashonaland West used their own local program for supplying CHWs with malaria products. Both SDP staff and VHWs said they are happy with the current procedures and think the system works well. The facilities visited reported that the district hospital (Siakobvu) had trained them on the system.

Nurses estimated that, during the rainy season, each VHW sees about 35 suspected cases of malaria each month. Of these, approximately 10 are positive. Kanyati reported that they see about 400 suspected cases of malaria at the clinic each month during the rainy season, and that the CHWs have significantly reduced their workload.

Neither clinic reported problems with ACT availability, and both seemed well stocked with all presentations. However, both clinics reported stockouts of RDTs and, at Kanyati, they reported frequent stockouts. The nurse at Kanyati said that the facility did not receive malaria commodities through ZIP (although they did receive PHCPs); instead they received them from either the district hospital or the Provincial Epidemiology and Disease Control Officer (PEDCO).

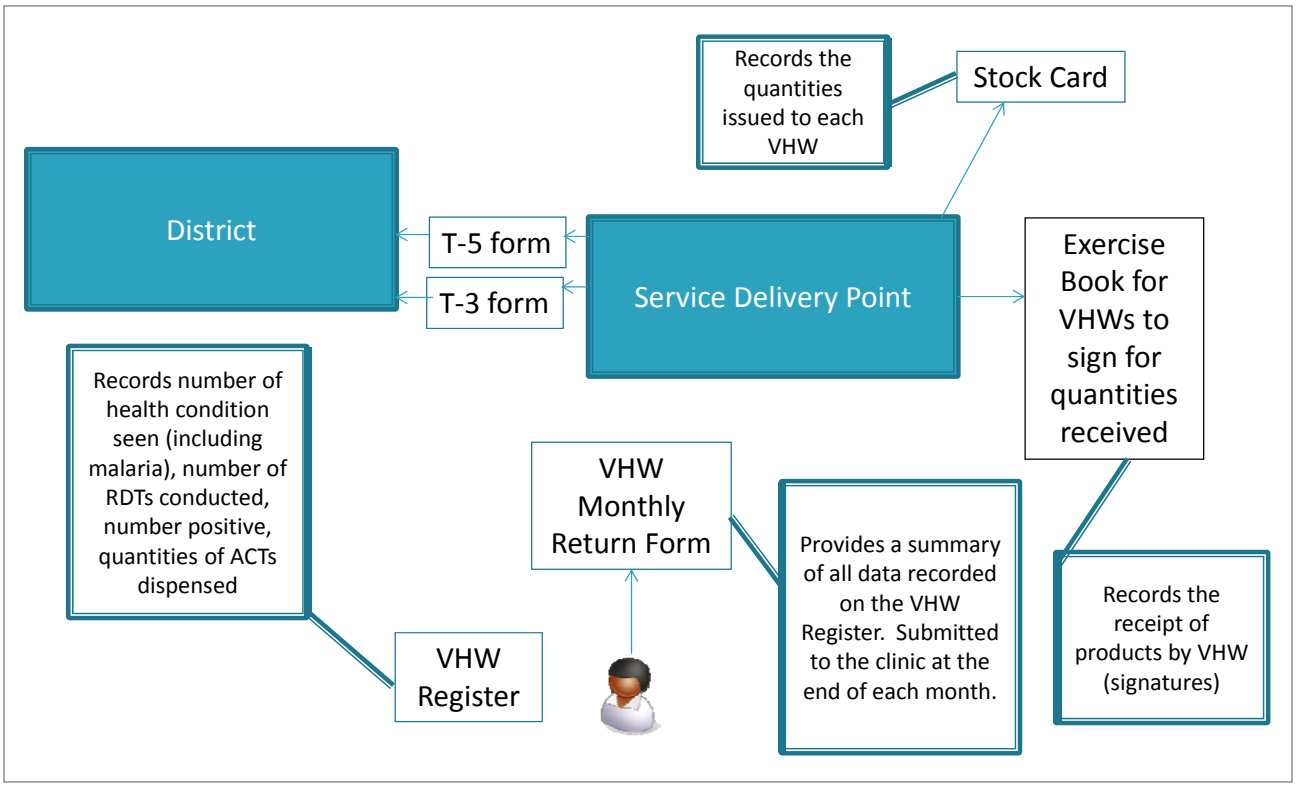
A nurse in a facility storeroom with ACT stock at Kanyati District Hospital.

However, after checking the Top Up software, the team found records showing that the facility received malaria products.

In their system, all VHWs manage ACTs and RDTs; however, at Kanyati, VHWs do not manage the 1×6 presentation. Instead, VHWs were instructed to refer all patients that would require the 1×6 to the health facility for services. All VHWs own bicycles and bags to carry the commodities, which Save the Children donated. VHWs are supposed to receive $14 per month, which is paid once a quarter. However, their payments have not been consistent.

The flow of information and the forms are shown in figure 2.

Figure 2. Flow of Information in Resupplying Village Health Workers in Mashonaland West



In this system, VHWs use the VHW Register to record the number of health conditions seen (malaria is one condition), the number of RDTs administered, the number of positive RDTs, and the quantities of ACTs dispensed. They use the information on the register to complete the VHW Monthly Return Form, which summarizes all the information on the register. They submit this to the clinic at the end of every month. Neither SDPs nor VHWs had any blank VHW registers or VHW Monthly Return Forms; rather, they drew the forms by hand on blank paper and then completed them.

The SDP staff use the information on the VHW Monthly Return Forms to total the quantities of RDTs conducted and ACTs dispensed at the community level for the entire facility. The district hospital instructed them to hand-write the community information on the T-5 form, which has a box where facilities report the total number of ACTs consumed. The staff then drew another box adjacent to this one and entered the quantities reported consumed by the CHWs. SDP staff also use stock cards to record the quantities issued to each CHW. Additionally, they use an exercise book for CHWs to sign for the quantities of products received.

None of the staff at either facility had seen the newly developed CHW RDT/Coartemether Register. When shown the register, they expressed some hesitation at using a separate form just for malaria, but agreed that they would.

VHWs are resupplied once a month. For ACTs, the dispenser packs are split and VHWs receive blisters. For RDTs, only a full kit of 25 is issued. The two facilities visited used different methods to resupply the CHWs:

- At Mola, the nurses base the resupply quantities on consumption from the previous month. The CHW receives the same quantity dispensed the previous month. Buffer stock is not accounted for and SOH is not recorded.
- At Kanyati, nurses base resupply quantities according to the size of the village and how far away the VHW lives from the clinic. The nurse interviewed reported that she usually gives five blisters of each presentation to VHWs that live short distances from the clinic, and gives 5–10 blisters of each presentation to those that live further away. Before each monthly meeting, the nurses pre-pack the supplies of ACTs and RDTs for each VHW. At the end of the meeting, the VHW signs for the quantities received.

VHWs had been trained on waste management. They were instructed to throw gloves and the RDT packaging into a Blair toilet or burned. CHWs received sharps boxes and were told to put sharps into the sharps boxes and to return the box to the clinic for disposal. At Mola District Hospital, two well-constructed burial pits are in place for waste disposal. At Kanyati, the nurse said they were out of sharps boxes and were improvising by using empty medicine bottles with a section of the top cut off.

Burial pits constructed for waste disposal at Mola District Hospital.

System Design

Overall Design Parameters

From the findings, some specific points emerged that must be considered when selecting a design option.

The resupply of CHWs is part of ZIP. When determining when and how SDPs are resupplied, how SDPs are resupplied through ZIP must be considered.

- The central level commented that they did not want the CHWs to complete long or cumbersome forms. The design had to be simple and clear.
- Although the focus of this assignment is on ACTs and RDTs, it is recognized that many CHWs manage other products, including malaria products that are not included in ZIP, such as gloves and sharps boxes; and non-malaria products, such as ORS and paracetamol.
- The central level stated that they would like to know the quantities of malaria products consumed at the community level versus the quantities of malaria products consumed at the SDP level.

During the system design workshop, small groups were given the following parameters that they were to use to select an option.

Design Options

After the field visits, the data were consolidated and the team used the findings to develop several different options for the system design. The two basic options were either that (1) the ZIP delivery team resupplies the CHWs, i.e., the CHWs are treated as *facilities;* or (2) the SDP resupplies the CHWs, i.e., the CHWs are not treated as *facilities*. For each of these options, there were several variations.

Option A: ZIP delivery teams directly resupplies the community health workers

Option A essentially mirrors how Community based distributors (CBDs) are resupplied with condoms and contraceptives under the DTTU system where the DTTU supplies approximately 300 CBDs. Each CBD is entered in the software as a *facility*. The SDP notifies the CBD the time of the next delivery. The CBD arrives at the facility on the day of delivery, and brings in a list of their SOH on a piece of paper. The CBDs are resupplied directly from the DTTU truck.

The variations for this option are—

A. CHWs are resupplied directly by the ZIP delivery team.
    1. CHW goes to the facility on the day of delivery and—
        a. brings a list of their SOH written on a piece of paper

b. brings their actual stock for a physical count.

2. CHWs go to the facility sometime before the delivery and—
   a. brings a list of their SOH written on a piece of paper
   b. brings their actual stocks for a physical count.
3. The SDP manages the stock for each CHW at the SDP. Stock on hand is kept at the facility; after it is given to the CHW, it is counted as dispensed.

Considerations for Option A

To help determine the best option, the advantages and disadvantages of each option were considered. For option A (ZIP resupplies the CHWs)—

- Total consumption by the community level and total consumption by the SDP level are easy and readily available. All data is clearly disaggregated.
- No additional forms are needed between the SDP and CHW level.
- Strong communication is required between SDP and CHW, so that SDP staff can inform CHW staff when to expect the ZIP delivery.
- ZIP must adhere to delivery schedules. Although this is true, in general, it becomes even more important when additional stocks are needed for a new cadre of staff.
- If ZIP resupplies the CHWs, and considers them *facilities*, then they would be resupplied quarterly. This significantly increases the amount of inventory held in the system (six months of stock for each CHW), and requires more storage space at the CHW's home.
- All 5,400 CHWs would need to be entered in both the Top Up software and the AutoDRV.
- The ZIP delivery team would spend more time at each SDP during delivery runs. If a SDP supports 10 CHWs, 10 separate entries would be needed in the AutoDRV.
- Only ZIP team leaders (~70) require training, not the SDP staff (1,200+).
- This system has not worked as designed under DTTU. Often the CBDs are not notified of when the delivery truck will arrive (which may be because the SDP itself is not notified of when the delivery truck will arrive), or it does not show up on the day of delivery. Instead, some facilities keep separate stock for each CBD.
- Instead of having CHWs bring in their SOH on a piece of paper, it would be necessary to design a form for CHWs to complete their SOH.

Option B: Service delivery points resupply community health workers

Under option B, CHWs receive their supplies from the SDPs, not from the ZIP delivery truck. The variations under this option are—

B. The SDP resupplies the CHWs.

1. CHWs are considered as part of the facility, like the dispensary, the laboratory, the wards, etc. When the ZIP trucks arrive, the CHW—
   a. brings a list of their SOH written on a piece of paper

b. brings their actual stocks for a physical count.

2. When stocks are issued to the CHWs, they are considered as *dispensed*. The SOH is not included when the ZIP teams do their calculations.

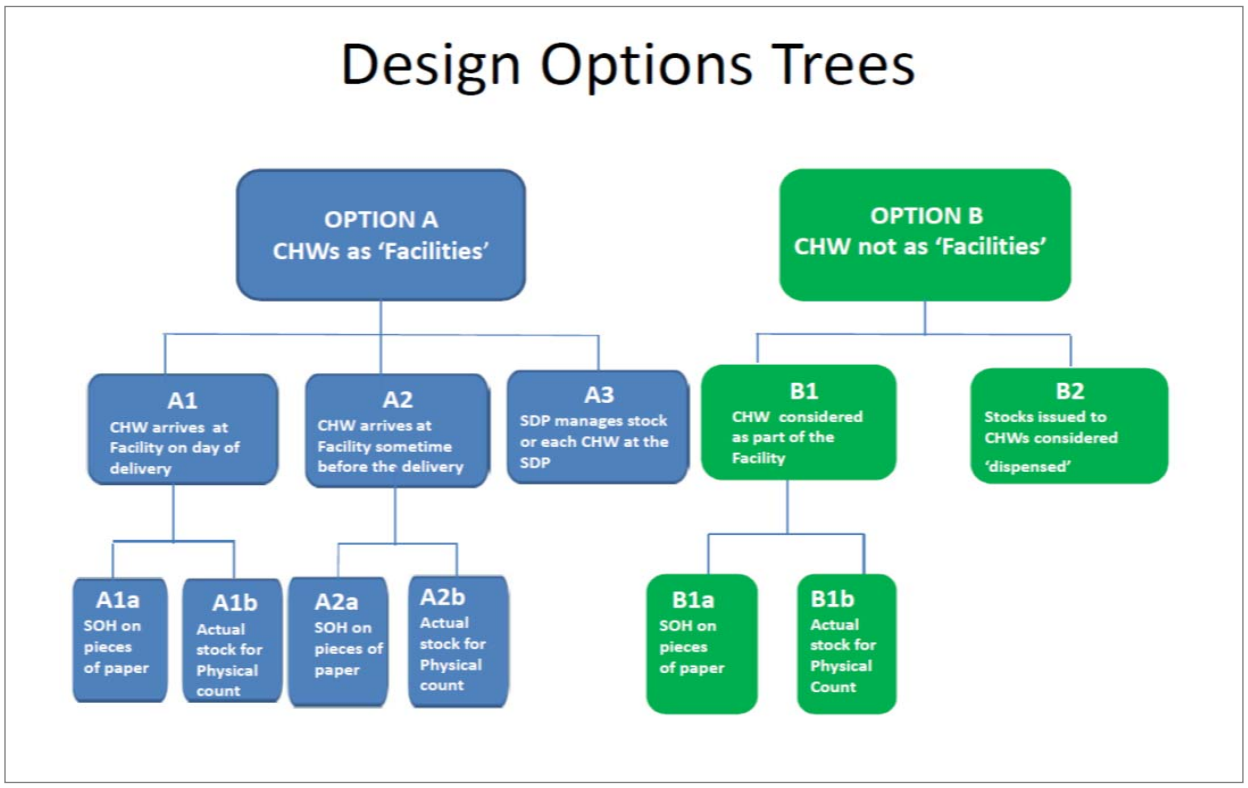
Considerations for Option B

The considerations for option B include the following:

- It is impossible to distinguish between consumption at the community level versus consumption at the SDP level. Because the ZIP delivery team collects information for the entire facility, it would be difficult to disaggregate the consumption data between the community level and the SDP. If the national program needs to make that distinction, a separate form would be needed to capture the consumption at the community level. The consumption data from these reports could be compared to the consumption data in the Top Up software to disaggregate consumption between the community and the SDP.
- The workload of the SDP staff has increased. They need to follow up with reports, resupply CHWs, and perform additional supervisory functions.
- Training is required for the SDP staff (1,200+).
- The ZIP AutoDRV Facility Worksheet needs to be modified to include CHWs as one of the stockkeeping locations.
- Option B more closely mirrors the old system—the Zimbabwe Essential Drugs Action Programme (ZEDAP).

See figure 3 for a summary of both design options and the variations under each option.

Figure 3. CHW System Design Options



Recommended Design

The option that was ultimately chosen, and that all participants agreed to, was option B 1 a. In this variation, CHWs are considered part of the facility, like the dispensary, the wards, or any place where stock is held. All participants agreed that it is important that the ZIP delivery team consider the SOH held by CHWs when calculating resupply quantities for the SDP. CHWs are resupplied once a month, during the regular monthly meetings for the CHW and the SDP. It was agreed that CHWs should hold a maximum of two months of stock and a minimum of one month of stock. The EOP was set at two weeks.

The group agreed on the following key design elements:

1. CHWs will use the CHW RDT/Coartemether Register (see appendix E). This register is completed once a day, whenever patients are seen. Also, to get resupplied, staff take this register to the SDP at the end of each month. After being resupplied, the CHW returns home with the register. The design team stated that the register should be in the form of a book, and the CHW should always keep it.

   The register is used for the following:

   - Record the quantities of RDTs used, the test results, and the quantities of coartemether dispensed.
   - Record the opening stock (at the beginning of the month) and closing stock (at the end of the month) for each product.
   - Provide the closing stock that the SDP staff record on the Stock on Hand of Malaria Products at the Community Level Form (explained below) and is given to the ZIP delivery team upon arrival. This will ensure that the SOH at the CHW level is always considered when the delivery team calculates resupply quantities.
   - Provide consumption and SOH data that the SDP staff use to calculate resupply quantities.
   - Record the quantities received by the CHW from the SDP each month.

   The register also contains information on the age and sex of the patient and whether or not they were given a referral.

   A few revisions were made to the form: added a row for opening stock, a row for closing stock, a row for quantity required (completed by SDP staff), and a row for quantity received (completed by SDP staff and signed for by the CHW).

2. The SDP staff will use a newly developed form, the Stock on Hand of Malaria Products at the Community Level Form, to record the quantities of SOH—they will give the form to the ZIP delivery team when they arrive (see appendix F). Therefore, the SOH at the community level is considered when the delivery team calculates the resupply quantities for the SDP. The information required to complete this form comes from the CHW RDT/Coartemether Register.
3. SDP staff use stock cards to record quantities issued to CHWs.
4. SDP staff use the following formula to calculate resupply quantities for CHWs:

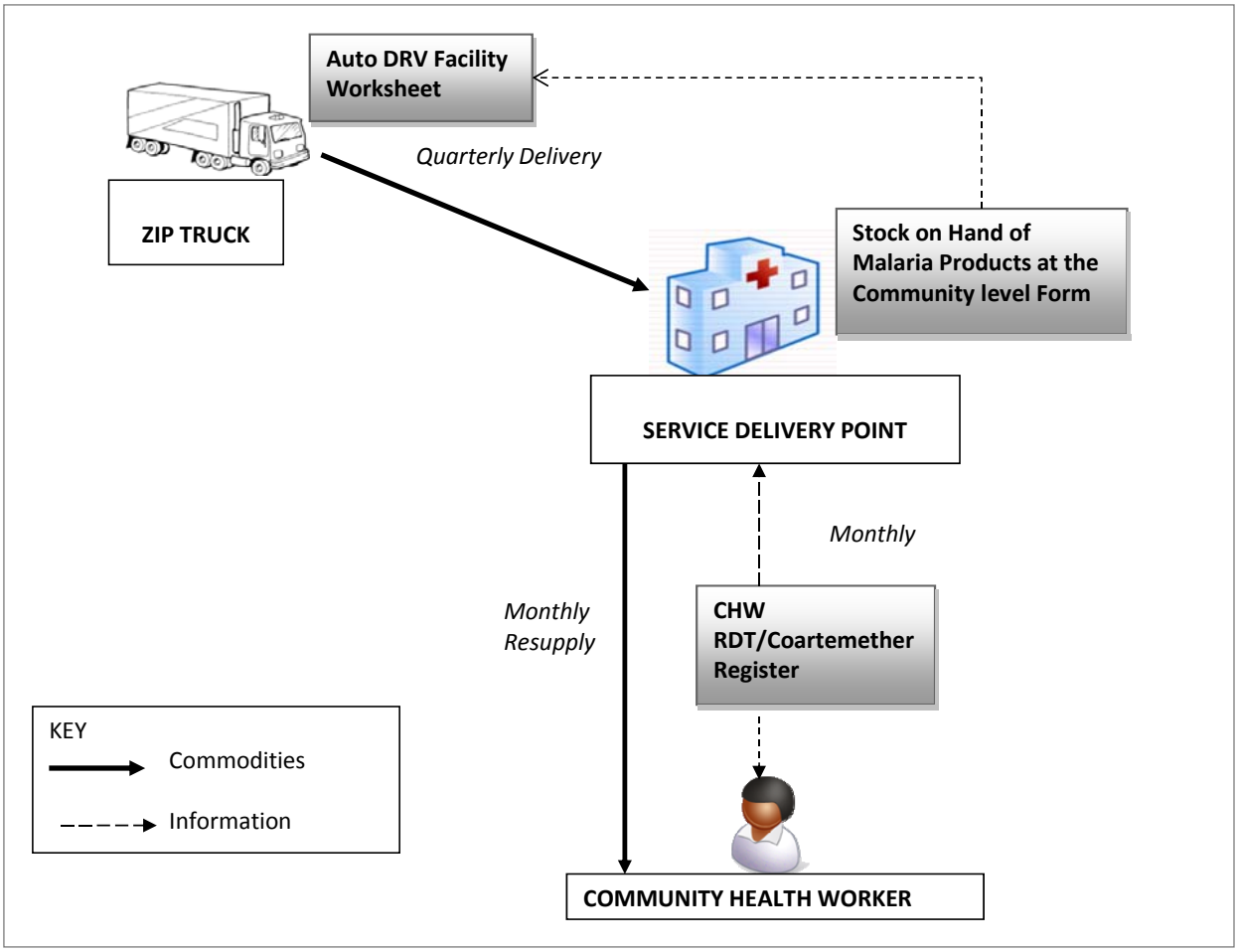
   Total dispensed during the month × 2

   minus the SOH

5. The ZIP delivery teams use the ZIP AutoDRV Facility Worksheet to account for stocks on hand at the facility. This form was modified to include a column for the community level (see appendix G), which the delivery team would obtain from the Stock on Hand of Malaria Products at the Community Level Form.

Figure 4 shows the flow of commodities and information.

Figure 4. Flow of Commodities and Information



The design group listed several reasons why option b was selected instead of option A. The advantages of B include the following:

- ZIP is still a relatively young program, and it is important not to overburden it. Adding an additional 5,400 facilities (CHWs) to the existing 1,500 facilities being served through ZIP would overburden the system.
- The MOHCW has said that ZIP is a temporary system. Eventually, the country will return to a traditional pull system, as described in ZEDAP.
- The ZIP delivery team for resupplying CHWs should not be depended on—the delivery schedule may change and CHWs could be missed.

- It is important for the SDP staff to supervise the CHWs and to be responsible for resupplying them.
- ZIP delivery teams would need much more time to make delivery runs, increasing the cost of the system.
- The design group also recognized that option B also has disadvantages, including—
  - The SOH and consumption is aggregated for each SDP, so it is impossible to use the reports produced from the Top Up software to determine the consumption for the community level compared to the SDP level.
  - SDP staff will need more training on how to calculate resupply quantities for CHWs. This could significantly increase the cost of rolling out the system out nationally. The selected design option also adds another form to the workload of the SDP staff.
  - Additional forms are needed. It was necessary to develop another form because it was agreed that the SOH at the community level is necessary for ZIP teams to do resupply calculations, and that the CHW should keep the CHW RDT/Coartemether Register, not turn it in to the SDP.

The stakeholders and the NMCP discussed the disadvantages. They decided that the advantages outweighed the disadvantages and that they should pursue option B.

Standard Operating Procedures and Training Materials

The consultants developed the following materials, based on the system design:

1. Procedures for the resupply of CHWs will be part of the *Guidelines for Management of Malaria in Zimbabwe: Home and Community Level*. The guidelines had not been mass produced, so the timing of this STTA was fortunate. These procedures include—
   a. an overview of the resupply procedures
   b. the maximum and minimum stock levels that the CHWs should hold
   c. the revised CHW RDT/Coartemether Register and a job aid (a job aid in another format was developed; it could be inserted into the front cover of the register after it is printed)
   d. Stock on Hand of Malaria Products at the Community Level form and a job aid.
2. Two sets of training curriculum on the developed procedures:
   a. For CHW training: Trainer session notes the resupply of CHWs will be included as part of the one-day training on malaria that all CHWs attend; an exercise on completing the CHW RDT/Coartemether Register is included.
   b. For SDP training: Trainer session notes on the resupply of CHWs; the session will be determined at a later date. Included in this session are—
      i. an exercise in calculating the resupply quantities for CHWs using data on the CHW RDT/Coartemether Register
      ii. an exercise in completing the Stock on Hand of Malaria Products at the Community Level Form.

3. The SOPs, trainer manual, and participant workbook for ZIP were updated with the new AutoDRV Facility Worksheet. The job aid for this form and all relevant exercises were updated.

Criteria for Success When Implementing the System

The design of the resupply procedures is a first step; undoubtedly, there will be challenges when the procedures are implemented, including—

- Funding for printing manuals, registers, forms, and training materials. During the system design workshop, a participant from NMCP noted that Global Fund is funding the training for the CHWs for malaria. However, this funding does not include producing all the required training materials, including the *Guidelines for Management of Malaria in Zimbabwe: Home and Community Level*. The CHWs who have completed training did not receive these guidelines; they must have a copy of these guidelines if they are to correctly diagnose and treat malaria in the communities. The funding for training also does not include the printing of all registers and forms. As agreed when the system was designed, the proposed format of the CHW RDT/Coartemether Register is a book, which the CHW will keep with them at all times. Additionally, copies of the Stock on Hand of Malaria Products at the Community Level form need to be printed. Finally, the training materials (including handouts for participants and trainer session notes) need to be printed; funding for this is uncertain at this time.
- Incorporate SOPs into the *Guidelines for Management of Malaria in Zimbabwe: Home and Community Level*. These procedures for resupplying CHWs need to be incorporated into the guidelines before the guidelines are printed for mass distribution.
- Incorporate curriculum and exercises into existing training materials: The curriculum and developed exercises—both for the CHWs and for the SDPs that resupply CHWs—need to be incorporated into the existing training materials on case management.
- One disadvantage of the system is that consumption and SOH data are not available to be disaggregated between the community and the SDP level through the routine reports produced by the Top Up software. While it is possible to obtain these data, it would be challenging. Options for obtaining this information, including any tools, should be explored.
    - One option could be that when the central level receives the information as reported in the T-5 report—where SDP staff physically write the quantities of ACTs and RDTs used by CHWs—this information could be aggregated. This aggregated consumption information could then be compared to the total consumption information from the Top Up software.
- ZIP can only operate when a full supply of commodities is available. Similarly, the procedures described in this report can only be implemented if there is a full supply of commodities—meaning that every CHW receives the full quantity of malaria products that they need, when they need them.

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Government of Zimbabwe, Ministry of Health and Child Welfare. 2008. *National Malaria Control Programme Strategy*, 2008 - 2013. Harare, Zimbabwe: Government of Zimbabwe.

Government of Zimbabwe, Ministry of Health and Child Welfare, National Malaria Control Programme. 2010. *National Malaria Prevention and Control Policy*. Harare, Zimbabwe: Government of Zimbabwe.

Standard Operating Procedures Manual for the Management of the Zimbabwe Informed Push (ZIP) System for Tuberculosis and Malaria Commodities & Primary Health Care Packages (PHCP), 2011. *Harare, Zimbabwe: USAID|DELIVER PROJECT*

Appendix A

Central-Level Questionnaire

Central Level

Interviewer:
Interviewee Name:
Interviewee Job Title:
Organization:
Date:

1. How many community health workers (CHWs) currently work at the central level? How many do you plan to have?

2. Will CHWs be national, or will the CHWs work primarily in the malaria endemic districts?

3. Compared to the population that the clinics serve, what percentage of the population will the CHWs serve?

4. What information do you need about malaria product use at the community level?

    a. *Does the central level need to know the quantity of malaria products dispensed at the community level compared to the quantities dispensed by the clinics?*

5. Currently, the *Guidelines for Management of Malaria in Zimbabwe: Home and Community Level* does not include specific guidance about how to manage products. Do you want those procedures to be integrated in this document, or do you want a separate document for the procedures?

6. Is the CHW RDT/Coartemether Register part of any larger guidelines?

7. How many CHWs have been trained on how to use the CHW RDT/Coartemether Register?

8. What specific products do the CHWs manage? The CHW RDT/Coartemether Register collects data only for rapid diagnostic tests (RDTs) and artemisinin-based combination

therapy (ACTs), but the guidelines include artesunate suppositories (three different strengths), gloves, sharps boxes, cotton swabs, etc.

9. The CHW RDT/Coartemether Register states that the CHW should bring the register to the clinic every month, including their medicines on hand; and the nurse at the clinic will supply them with medicines and test kits for the next month. What is this information based on? What calculation does the nurse use? Are forms used at the clinic level? Is an issue voucher used to record the transaction?

10. Have maximum-minimum levels been set for CHWs, or for the emergency order point?

11. Specifically, when should the CHWs go to the clinic for resupply?

12. Have there been discussions about CHW resupply procedures being combined with Zimbabwe Informed Push (ZIP)? What was the result of those discussions?

13. Are you willing to revise the existing CHW RDT/Coartemether Register and/or procedures?

14. What is the plan or expected time for introducing the revised procedures?

15. Do you plan to train all the CHWs?

16. Do you plan to train the staff at all the clinics that resupply CHWs?

Appendix B

Clinic-Level and Community-Level Questionnaire

The Clinic Level

Interviewer:
Interviewee Name:
Interviewee Job Title:
Clinic & District Name:
Date:

1. How many community health workers (CHWs) does this clinic supply?

2. Are the CHWs that distribute malaria products the same people that distribute condoms and contraceptives?

3. How far away from the clinic do the CHWs live? Is it difficult for them to get to the clinic? Why?

4. What transportation do the CHWs use to get to the clinic?

5. What products do you give the CHWs?

6. How often do you give the CHWs products?

7. How do you decide how much product to give the CHWs?

8. How long does it take you to resupply the CHWs?

9. Do you always have enough products to give to the CHWs?

10. Do you split the ACT dispenser packs? If so, do you repackage the blister strips into a different container?

11. Do you divide the RDT kits when you issue them to CHWs? If so, do you repackage the tests into a different container?

12. What specific forms do you use when resupplying the CHWs? Where do you record transactions?

13. Do you report information to anyone about the products the CHWs use?

14. Have you had any training on procedures to use when supplying CHWs with malaria products?

15. Do you know about ZIP? Is it working well?

16. What do you think is working well when you resupply CHWs?

17. What would you change?

18. What do you think is the best way to resupply CHWs?

Notes:

The Community Level (CHWs)

Interviewer:
Interviewee Name:
Interviewee Job Title:
Community/Village Name:
Date:

1. What clinic supplies your products? Do you always receive products from the same clinic?
2. How far away from the clinic do you live? How difficult is it for you to get to the clinic?
3. What type of transportation do you use to get to the clinic?
4. What products do you manage?
5. How do you get the products (what procedures do you use)?
6. How long does it take you to get resupplied?
7. How often are you resupplied with products?
8. How much product do you get? How long does it last?
9. Do you complete any forms? What are they? What are they used for?
10. Do you ever stock out of products? What do you do?
11. How do you store the products?
12. What do you do with expired products?
13. What do you do with the waste?
14. What do you think is the best way to be resupplied with products?

Notes:

Appendix C

CHW System Design Workshop Agenda

System Design Workshop: Resupplying Village Health Workers with Malaria Products

Agenda

8:30–8:45	Opening remarks—Directorate of Pharmacy Services and National Malaria Control Program
8:45–9:15	Welcome and introductions
9:15–9:45	Presentation of findings
9:45–10:15	Presentation of design options
10:15–10:30	Tea break
10:30–11:30	Small group work
11:30–12:00	Small group presentations
12:00–1:00	Discussion
1:00–2:00	Lunch
2:00–3:00	Finalization and consensus
3:00–3:15	Next steps
3:15–3:30	Closing remarks—DPS and NMCP
3:30–3:45	Tea break

Appendix D

CHW System Design Workshop Participant List

	Name	Title	Organization
1.	Chester Marufu	MIS Advisor	USAID | DELIVER PROJECT
2.	Tsungi Chiwara	Upstream Logistics Coordinator	MOHCW, Logistics Sub-Unit
3.	Louis Kajawu	Distribution Coordinator	NatPharm
4.	Misheck Ndlovu	Supply Chain Management Advisor	MOHCW, DPS
5.	Dave Alt	Country Director	USAID | DELIVER PROJECT
6.	Tinei Chitsike	Logistics Advisor	USAID | DELIVER PROJECT
7.	Bernard Madzima	Medical Officer of Health Mashonaland East Province	MOHCW
8.	Lyness Majonga	Admin/Education Officer	MOHCW
9.	Richard Sabumba	LSU Manager	MOHCW, Logistics Sub-Unit
10.	Arthur Sanyanga	Malaria Logistics Focal Person	MOHCW, DPS
11.	Agripa Mtambara	Lab Logistician	MOHCW, Directorate of Laboratory Services
12.	Simbarashe Nyaniwa	Logistics Advisor	USAID | DELIVER PROJECT
13.	Andrew Tangwena	M&E Officer	NMCP
14.	Boniface Machingauta	Provincial Pharmacy Manager, Mashonaland East Province	MOHCW, DPS
15.	Diana Hore	Regional Stores Manager	NatPharm
16.	Naomi Printz	Senior Technical Advisor	USAID | DELIVER PROJECT
17.	Nokuthula Mujuru	Malaria Programme Officer	UNDP
18.	Theresa Nyamupachitu	Senior Program Officer	USAID | DELIVER PROJECT

Appendix E

CHW RDT/Coartemether Register

CHW RDT / COARTEMETHER REGISTER

Province **District** **Nearest Clinic:**
Name of CHW **Village** **Ward**

Date	Name	Age	Sex	RDT test done		Coartemether Tablets given				Referred	
				Positive +ve	Negative ve	1x6	2x6	3x6	4x6	Yes	No
	Opening Stock:										
	TOTAL for the Page										
	TOTAL for the Month										
	Closing Stock:										
	Quantity Required: Total for the Month x 2 minus Closing Stock										
	Quantity Received										

Name and Title of Issuing Officer: _____

CHW Signature: _____

NOTE: The greyed out parts should be completed by the NURSE ONLY.

Appendix F

Stock on Hand of Malaria Products at the Community Level Form

Stock on Hand of Malaria Products at the Community Level Form

Name of Health Facility _____

District/Province _____

Month and Year _____

	Name of Community Health Worker	Rapid Diagnostic Tests (tests)	Coartemether 1 x 6 (blisters)	Coartemether 2 x 6 (blisters)	Coartemether 3 x 6 (blisters)	Coartemether 4 x 6 (blisters)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
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16						
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22						
23						
24						
25						
26						
27						
28						
29						
30						
	TOTALS					

Appendix G

ZIP AutoDRV Facility Worksheet

ZIP AutoDRV Facility Worksheet (TB and Malaria)

Facility Name: _____

	Product	Unit	Adjust-ments	Adjust-ment Type	Physical Count				Days out of stock	Qty to Expire in 3 months
					Storeroom	Dispensary Area	Community Level	Total		
Malaria commodities										
1	Artemether/ Lumefantrine 1 x 6	blister of 6 tabs								
2	Artemether/ Lumefantrine 2 x 6	blister of 12 tabs								
3	Artemether/ Lumefantrine 3 x 6	blister of 18 tabs								
4	Artemether/ Lumefantrine 4 x 6	blister of 24 tabs								
5	Sulphadoxine/ Pyrimethamine 500/25mg tablet	tablet								
6	Rapid Malaria Diagnostic Test	test								
7	Quinine 300mg tablet	tablet								
8	Quinine 600mg/2ml injection	ampoule								
Tuberculosis commodities										
9	RHZE 150/75/400/275mg tablet	tablet								
10	RH 150/75mg tablet	tablet								
11	RH 60/30mg tablet	tablet								
12	RHE 150/75/275mg tablet	tablet								
13	RHZ 60/30/150mg tablet	tablet								
14	Streptomycin 1g	vial								
15	Sputum cups	each								
16	Ethambutol 100mg tablet	tablet								
17	Ethambutol 400mg tablet	tablet								
18	Isoniazid 100mg tablet	tablet								
19	Pyrazinamide 500mg tablet	tablet								
20	Rifampicin 150mg capsule	capsule								
21	Rifampicin 100mg/5ml suspension	ml								
22										

Adjustment Types: E Expired, D Damaged, TI Transferred In, TO Transferred Out, F Found , L Lost , S stolen ,T Training ,EO Emergency Order

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