



USAID | DELIVER PROJECT

GHANA: SYSTEM DESIGN FOR TB COMMODITY DISTRIBUTION SYSTEM, MARCH 2008

NATIONAL TB CONTROL PROGRAM / MINISTRY OF HEALTH



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Abstract

In June 2007, the Ministry of Health (MOH) and Ghana Health Services, with technical assistance from the USAID I DELIVER PROJECT, Task Order 1, conducted a preliminary two year quantification and procurement planning for TB medicines in Ghana. This activity revealed supply chain inadequacies such as the absence of a formal Logistics System, no Logistics Management Information System (LMIS) to collect and report on logistics data and frequent occurrence of stock outs for TB drugs. It was recommended that a logistics system for TB medicines in Ghana be designed.

In January 2008, the National TB Program, Ministry of Health and Ghana Health Services with technical assistance from the USAID I DELIVER PROJECT, designed a logistics system for TB medicines. This report presents the methods used to design the logistics system, the in country pipeline, the inventory control system, the logistics forms that will be used to manage the information by collecting essential logistics data and the implementation plan of the design in Ghana.

Cover photo: Dodowa, Greater Accra, Ghana, 2008. Group of workshop participants designing the Inventory Control System for TB Medicines in Ghana

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ACRONYMS

AMC	Average Monthly Consumption
CMS	Central Medical Stores
CTU	Central TB Program
DOTS	Direct Observation Treatment, Short Course
E	Ethambutol
GF	Global Fund for HIV/AIDS, Tuberculosis and Malaria
GHS	Ghana Health Services
ICS	Inventory Control System
H	Isoniazid
LMIS	Logistics Management Information System
MOH	Ministry of Health
NTP	National TB Control Program
R	Rifampicin
RRIV	Report, Request, Issue & Receipt Voucher for National TB Control Program
RMS	Regional Medical Stores
SDP	Service Delivery Point
SOP	Standard Operating Procedures
SOW	Statement of Work
TA	Technical Assistance
TB	Tuberculosis
USAID	U.S. Agency for International Development
Z	Pyrazinamide

ACKNOWLEDGMENTS

The authors would like to acknowledge the support given to this activity by the Ghana Ministry of Health / Ghana Health Services, and the National TB Control Program and for providing the opportunity to discuss the current system and visit their facilities in order to prepare for the design workshop.

Particular thanks go to the individuals selected to participate in the system design workshop; their commitment and collaboration greatly facilitated the process.

All the organizers and participants that contributed in this activity took time from their busy schedule to attend the workshop, interact with the facilitators, provide information, and answer pertinent questions that enabled the design of the TB medicines logistics system. They deserve sincere gratitude for their involvement and participation.

The authors hope that this technical assistance and the ensuing results of the system design will enable NTP and MOH/GHS to strengthen their capacity to manage TB medicines and to respond to the need for a reliable and consistent supply of quality TB medicines in Ghana.

The authors would like to express much gratitude to their colleagues, Egbert Bruce, Francis Ashagbley and Albert Nettey from the USAID | DELIVER PROJECT Ghana Office, who assisted in the preparation and organization of the design workshop.

EXECUTIVE SUMMARY

The USAID | DELIVER PROJECT first provided technical assistance to the National TB Control Program (NTP) of Ghana in June 2007. The purpose of the first technical assistance was to undertake a preliminary two year quantification and procurement planning for tuberculosis (TB) medicines. During the quantification activity it was revealed that there were supply chain inadequacies, such as the absence of a formal Logistics System, no Logistics Management Information System (LMIS) to collect and report on logistics data and frequent occurrence of stock outs for TB medicines. It was decided that USAID | DELIVER would provide further technical assistance to NTP to design a TB commodity logistics management/distribution system capable of ensuring a consistent supply of TB medicines at all levels of the system and with an eye on potential integration into the current national supply and reporting systems.

The purpose of the activity was to strengthen the provision of TB services through the design of a logistics management information system capable of collecting and reporting timely logistics data to enable quantification, procurement, storage and distribution; an inventory control system that ensures proper management of stock levels; and a distribution system for efficient movement of commodities from manufacturers right through to facilities. This report presents the methods used to design the logistics system, the recommended TB logistics system including; the in country pipeline, the inventory control system, the logistics forms that will be used to manage the information by collecting essential logistics data and the implementation plan of the design in Ghana.

During the first week of the activity the technical advisors observed the existing TB commodity logistics system to identify the strengths and weaknesses in the distribution and tracking of TB commodities at the central and peripheral levels. The technical advisors met with stakeholders in the Ministry of Health (MOH), Ghana Health Service (GHS) and NTP. They also visited some facilities to observe the current flow of commodities and information from Central Medical Stores (CMS) to treatment sites and treatment sites to CMS respectively. Concurrently with the above, the TA providers reviewed relevant documents including the Ghana Public Health Commodities Standard Operating Procedures Manual and the 2007 TB Quantification Technical Assistance Report to have a comprehensive understanding of the current system.

On the second week of the visit a System Design Workshop was conducted. The workshop was held at the Marina Hotel in Dodowa from March 10th to March 13th 2008. 22 participants involved with managing TB commodities and representing all levels of the system attended the workshop. The initial one and a half days involved teaching basic logistics concepts (Introduction to Health Logistics, LMIS, Assessing Stock Status and Inventory Control Systems) relevant to system design. The remaining days included the actual designing stage where participants were given the opportunity to come up with an LMIS and ICS for managing TB medicines in Ghana. The type of inventory control system and the tools for collecting data by levels (LMIS) were decided on by the participants with facilitation from USAID | DELIVER PROJECT technical advisors.

In designing the logistics system for TB commodities participants were encouraged to consider other logistics systems currently being used in Ghana for other commodities and consider how this logistics system for TB commodities may be integrated in the future. As a result the recommended design has aspects of both the Ghana Public Health Sector Logistics System and the ART Logistics System.

On March 14th the participants presented their design to stakeholders from MOH, GHS and NTP. Stakeholders were given the opportunity to ask questions regarding the design and participants were encouraged to defend their recommendations.

Summary of System Design and Recommendations

- The pipeline was redesigned to reflect the in-country pipeline for public health sector commodities in Ghana.
- A forced ordering, pull (or requisition) system at each level was decided on by the participants.
- Maximum and minimum stock levels and emergency order points were established for each level of the system.
- A combined logistics management information system (LMIS) report and transaction record was developed to link the reporting of consumption with re-supply quantities. As a result all transactions will be traced on a single form reducing the use of multiple papers.
- A TB Dispensing Register was designed to capture consumption or dispensed-to-user data, which previously has not been collected by the program.
- These two new forms which were designed are modeled on the forms currently being used by the National HIV/AIDS Control Program in Ghana. All forms will be preprinted and carbonated if duplicates are required.
- The roles and responsibilities of key personnel at the central, regional and health facility level were identified. These roles included assessing stock status, managing inventory and completing reports and requests for TB medicines.

The next step is to develop Standard Operating Procedures based on the design and recommendations established in the workshop. A manual of the Standard Operating Procedures will be developed to be used by health staff at all levels of the system. The SOP manual contains Job Aids associated with each record and report to guide how and when to use the forms and who is responsible for maintaining them. Once the Standard Operating Procedures are drafted they will be reviewed by NTP, GHS and MOH for final approval.

The logistics system for TB commodities is to be implemented as soon as possible. The Standard Operating Procedures Manual will be finalized in the next two months and the training of trainers will occur soon after finalization. Following this training will begin the roll out of the system to all parts of the country. It is recommended that a review of the new TB logistics system be conducted six months after implementation.

I. BACKGROUND

The USAID | DELIVER PROJECT with support from USAID continues to provide technical assistance and support to the Ministry of Health (MOH) in Ghana particularly the national HIV/AIDS, essential medicines and reproductive health programs. Recently, USAID | DELIVER has extended its support to the National TB Control Program (NTP) to strengthen its supply chain.

To date, USAID | DELIVER has provided support to the NTP by undertaking a preliminary two year quantification and procurement planning for TB medicines conducted in June 2007. The quantification identified major weaknesses within the TB supply chain including the absence of a Logistics Management Information System (LMIS) to collect and report on essential logistics data and lack of an Inventory Control System (ICS) to help maintain appropriate stock levels.

In light of this, USAID | DELIVER was tasked to spearhead the design of a TB logistics system to ensure a consistent supply of TB medicines at all levels of the health system. In essence, the task involved facilitating the design of an LMIS capable of collecting and disseminating logistics data to inform re-supply decisions, forecasting and quantification and routine system monitoring. An ICS would also be designed to ensure the program maintained adequate TB medicines at all levels of the system thereby eliminating stock imbalances. Lastly, key roles and responsibilities would be defined for the management of TB medicines. The designed system would be in line with the Ghana Public Health Commodities Logistics system which is a key step towards integration of supply chains in the country.

A. Purpose of the Technical Assistance:

The overall purpose of this Technical Assistance was to strengthen the supply chain for the TB program through the design of an LMIS and inventory control system (ICS) to manage TB medicines in Ghana including developing a Standard Operating Procedures (SOP) Manual. A team of two technical advisors prepared for and facilitated the activity.

Activities accomplished:

1. Met with key stakeholders within the MOH, GHS and NTP to review the scope of work and receive guidance on the design activity.
2. Reviewed existing documentation including previous technical assistance reports and other logistics manuals already in use in Ghana to obtain a comprehensive understanding of the current system.
3. Conducted site visits to both public and private facilities to have a visual appreciation of the flow of commodities and information within the system.
4. Conducted a three and a half day design workshop attended by key participants from all levels of the system (central, regional and health facility level). Prior to the design process the participants were introduced to key logistics concepts and topics relevant to system design and implementation. The designed logistics system encompassed:
 - Defined key roles and responsibilities in the management of TB medicines.
 - A comprehensive LMIS capable of capturing, processing and presenting logistics data to support the supply chain management activities of the NTP. This included developing consumption and stockkeeping

records for collecting logistics data and developing a combined report, request, issue and receipt form for reporting logistics data.

- Defined an inventory control system, including maximum and minimum stock levels and re-supply intervals to help in maintaining adequate TB medicines at all levels of the system.

6. Conducted pre- and post-visit briefings with local officials and USAID.

7. Submitted a technical record before departing from Ghana

8. Prepared and submitted a final technical report of the activities conducted under this SOW including outstanding policy or technical issues to be addressed, recommendations, and a road map for system implementation.

9. Prepared and submitted a Standard Operating Procedures Manual to document the logistics management activities.

B. Program Overview:

National Tuberculosis Control Program (NTP)

The NTP was established in 1994 as a department under the Ministry of Health (MOH) of Ghana. The program is involved in TB case detection, diagnosis and treatment. The NTP adopted the Directly Observed Treatment, Short-Course (DOTS) strategy to ensure adherence to treatment. The program provides comprehensive TB services and achieved nationwide coverage in 2000. The objectives of the NTP include reducing mortality and morbidity caused by TB, reducing transmission of TB infection and prevention of drug resistance. Currently, the NTP detected and treated 12 868 cases of TB in 2007 and expects to treat 13 500 in 2008. It has been predicted by WHO that only a fifth of all TB cases are reported in Ghana every year and therefore the TB Control Program is likely to continue to grow.

Successful TB treatment is to a larger extent attributed to having a consistent supply of TB medicines at all facilities providing TB treatment. The NTP in Ghana is in the process of improving case detection rates including scaling up the number of TB cases being treated per year thus reinforcing a need for a reliable commodity management system that guarantees the continuous availability of TB drugs at treatment centres.

TB Facilities

There are a total of 1600 facilities providing TB treatment in Ghana of which 76 are private facilities. Treatment can be accessed at both public and private accredited sites within Ghana. Plans are underway to ensure TB treatment is provided in prisons as well. To support the treatment sites, Community Health Workers and Community Volunteers have been trained to be treatment supporters. They help in implementing DOTS, completing the TB treatment cards and providing much needed support to a patient during the treatment phase.

Overall Current Supply Chain Management

Currently, February 2007, service delivery points (SDPs), which include community health clinics and private facilities, make requests for TB medicines on an ad hoc basis from the districts hospital pharmacy when a patient is diagnosed with TB. The idea being that the district hospital pharmacy supplies the SDP with patient kits on a case by case basis. SDPs are not intended to keep additional stock as initiating TB treatment is not an emergency. However in some SDPs there is a small amount of stock without any formal inventory management of this stock.

At the district level, referring to district hospital pharmacies, the requirements are determined by aggregating the number of cases in the catchment area plus some extra safety stock. They request for commodities on a quarterly

basis from the Regional Medical Stores (RMS). The Regional Medical Store in turn collates the number of cases treated in all the region and sends an aggregated requisition form to NTP. The NTP then verifies the request and completes an issue voucher which is sent to Central Medical Stores (CMS) for picking, packing and distribution. The CMS generates an electronic invoice and issues supplies to the RMS. Teaching hospitals also order in the same way through CMS on a quarterly basis based on the number of cases treated during the quarter.

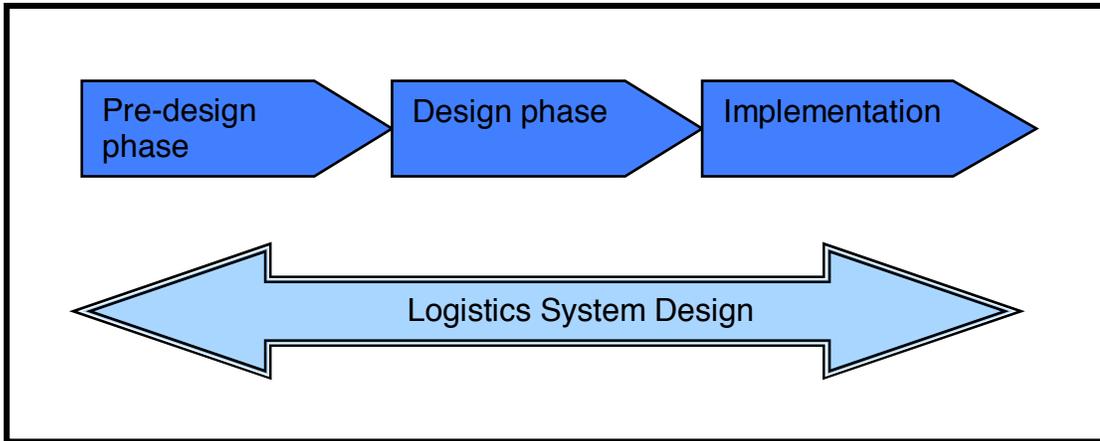
CMS receives supplies from international suppliers on a yearly basis after Global Fund has procured the drugs. The TB program recently began sourcing treatment kits through the Global Drug Facility. The kits contain a full course of therapy securing uninterrupted supply of medicines for the patient once treatment is commenced.

Given the absence of a maximum-minimum inventory control system through the TB supplies distribution network, there are currently no formal procedures for determining re-supply quantities for the Health Facilities and Regional levels. There is also no mechanism for preventing stock outs or overstocking.

II. METHODOLOGY

The design process included 3 distinct phases; the pre-design, design and implementation phase as depicted in the flow diagram.

Methodology Flow Diagram



A. Pre-Design Phase

The pre-design phase involved data gathering and analysis which is a critical step in informing the system design process. This involved document review, undertaking key informant interviews and visiting selected sites.

Document Review

A number of documents were reviewed to obtain a broader understanding of the current system. These included the Public Health Sector SOP manual which provided the basis for public health commodity management in Ghana and forms the basis for integration. The TA report for the preliminary TB medicines quantification conducted in 2007 provided a background to the activity and outlined some identified weaknesses of the current system and recommended strengthening the supply chain through designing of a formal logistics system. Other documents reviewed included current forms in use such as the TB treatment card, quarterly report on TB cases, requisition form and the issue voucher. Lastly, the TA provider reviewed policy documents including national TB guidelines.

Key Informant Interviews

To augment the independent document review, key informant interviews were held with relevant stakeholders within the MOH and Ghana Health Service (GHS). This was to further obtain a comprehensive view of the system and to be informed of any program expansion plans. Key people met included but were not limited to the National TB Manager, Director of Procurement and Supply, Director of Supplies, Stores and Drug Management (SSDM) and the Chief Pharmacist of the Pharmacy Unit. See Annex A for the assessment tool and Annex B for full list of contacts.

Site Visits

To confirm the findings of the reports and interviews with the situation on the ground, site visits were undertaken to a public (Kokrobite Community Clinic) and a private accredited health facility (Christian Medical Centre), a district hospital (La General Hospital), RMS in Accra and Central Medical Stores in Tema. This enabled the TA providers to get a snapshot view and map the flow of commodities and information through the system.

The pre-design technical review enabled the TA providers to map the current TB medicines supply chain diagram and identify the strengths and weaknesses in the current system. This knowledge gained helped to inform the actual design process. See Annex C for details on Findings from Site Visits.

B. The Design Phase

The design phase of the process consisted of conducting a system design workshop. The design component is the phase in which participants within the health system are engaged in constructing an appropriate TB logistics system, with the assistance of the technical advisors, based on their own “hands-on” experience.

Design workshop

The design workshop was chosen as the most appropriate approach to achieving an improved TB medicine logistics system. It involved the identification of key participants drawn from all levels of the system (central, regional, and health facility level). The workshop was undertaken from the 10th - 13th of March 2008 in Dodowa, Ghana. A total of 22 participants constituted the '*design team*'. A complete list of the attendees, the goals and objectives of the workshop and the workshop schedule can be found in Annex D, E and F.

Training

A high percentage of participants had limited logistics knowledge and this meant the first one and half days were dedicated to the teaching of critical logistics definitions and concepts relevant to system design. This prepared the participants for the upcoming task of designing a logistics system. Topics covered included Introduction to Health Logistics, Introduction to LMIS, Assessing Stock Status and Inventory Control Systems all of which are fundamental when undertaking a logistics system design.

Review of the current system

With their new found knowledge the participants were given the opportunity to describe how they saw the current TB commodity distribution system. They described the flow of TB products and information through the system and the type of records used. The TA providers also presented a brief review of the assessment they had done in the pre-design phase. This exercise produced a diagram on the current pipeline which acted as a baseline for designing the new system.

The participants were also presented with the pipeline used for public health commodities in Ghana and encouraged to consider this pipeline when designing the new system as integration is likely in the future.

Vision for the new system

To initiate the designing process, participants had the opportunity to articulate their vision of the recommended system and its characteristics. As they embarked on the designs they periodically referred to this vision to enable a recommended design that embodied their vision. The articulated characteristics included;

- A simple, distribution system

- An efficient logistics system
- Full supply situation of TB medicines
- Zero stock out of TB medicines
- Minimized losses through expiries or damages

Actual Design stage

The actual designing involved dividing the participants into four working groups with two groups focusing on designing the LMIS system, whilst the other two designed an ICS. The groups were given step by step instructions on how to design their section of the system.

The whole design process was iterative in nature. Once the groups had had time to discuss and make recommendations for a new system the groups were convened into one large group to share their work in progress and to build synergies within the recommended systems.

The following day, the groups merged into two large groups (one LMIS and ICS) to continue fine-tuning the recommended designs. The final two groups presented their recommended systems, the other participants provided feedback and discussion and consensus was achieved amongst all participants on a single ICS, LMIS and the key roles and responsibilities for the management of TB medicines.

Two participants were selected to present the recommendations to the relevant stakeholders. See Annex L and M for the list of stakeholders who attended and the presentation by the participants.

The results of this work are outlined in the Section III, Recommendations of this report.

C. Implementation Phase

The final stage in the design process is the implementation stage which will entail finalizing the recommended system and developing the Standard Operating Procedures Manual. The Standard Operating Procedures (SOP) Manual contains Job Aids which outline how each record and report is to be used and who is responsible for this. The manual also describes the flow of commodities and information between the levels of the health system.

Once the SOP has been finalized and if the recommended system is approved, the designed LMIS forms will be reproduced and a Training of the Trainer's workshop will be conducted followed by the roll out of the implementation. A detailed roadmap for implementation is provided in the section on next steps.

D. Key Assumptions

To facilitate the system design the design team generated a few assumptions that informed the design process. These were that:

1. TB medicines will always be in full supply
2. Available storage would be adequate to store recommended maximum and minimum levels.
3. Transport at facilities are available for use in the collection of TB medicines if necessary, and that TB medicines will be distributed via the scheduled delivery system used for other health commodities in the regions.

III. RECOMMENDATIONS

This section describes the recommendations made by the design workshop participants to strengthen the provision of TB services through the design of a logistics management information system capable of collecting and reporting timely logistics data to enable quantification, procurement, storage and distribution and an inventory control system that ensures proper management of stock levels.

This system will be outlined in detail in the Standard Operating Procedures Manual so that every health worker throughout the Ghana Health Service who is involved with TB commodities will understand what their role is in ensuring a continuous supply of TB commodities for their clients.

A. Logistics Management Information System (LMIS)

Three essential data items, stock on hand, consumption and losses and adjustments, are required to run a logistics system and, therefore, must be captured by the LMIS. Generally three types of records are used to capture this data at the facilities; stock-keeping records, transaction records and consumption records. An LMIS report is then used to transport this information up the system to program managers to make timely decisions.

Stock-keeping Records

It was observed that stock-keeping records are already in place in Ghana, including a Bin Card, Tally Card and Inventory Control Card. The participants felt they all collected the necessary information and that one record should be chosen. At the time of the workshop the Inventory Control Card was chosen by the participants. However it has since been established that the Ghana Public Health Commodities Logistics System will be using a Bin Card as their stock keeping record. In the interest of integrating the logistics systems in the future, and as all participants agreed there was no significant difference between the records, the Bin Card will be included in the TB logistics system instead of the Inventory Control Card. (See Annex H: Bin Card).

Consumption Records

To record consumption a TB Dispensing Register was designed to be used at facilities where the TB medicines are dispensed. The register will not be used for daily DOTS but is to be used at the initiation of therapy, when the patient is weighed and the correct medicines and dosage is prescribed for that patient. At this time the exact quantity of tablets and injections for the duration of the therapy is dispensed, and the patient's name is placed on the box or kit and the dispensed-to-user quantity is recorded in the TB Dispensing Register. These medicines will then either remain at the health facility or be transferred to another health facility for daily DOTS or a portion of the medicines may be given to the community support worker to monitor daily intake. (See Annex I: TB Dispensing Register).

Combined Transaction Record and LMIS Report

In acknowledgement of the number of reports expected of staff at lower end facilities it was recommended that the LMIS report and the transaction record should be combined. This Monthly LMIS Report, Request, Issue & Receipt

Voucher is modeled on the form currently used in the National HIV/AIDS Control Program in Ghana. However the TB team decided to also include the issue and receipt voucher on the form to reduce paperwork. This report contains all three essential data items and is a self balancing report that allows easy calculation of reorder quantities.

The advantage of a combined Report, Request, Issue and Receipt Voucher (RRIRV) is that all transactions can then be traced on a single form reducing the use of multiple papers. In addition reporting rates often increase when reporting is linked with re-supply quantities. (See Annex J&K: LMIS Report, Request, Issue & Receipt Voucher).

The Standard Operating Procedures (SOP) Manual contains Job Aids to guide staff in how the records and reports should be used. The SOP also outlines who is responsible for each form and when each form is to be used.

B. Inventory Control System (ICS)

The purpose of an inventory control system is to inform personnel when and how much of a commodity to order and to maintain an appropriate stock level to meet the needs of patients. A well designed and well operated inventory control system helps to prevent shortages, oversupply, and expiry of medicines.

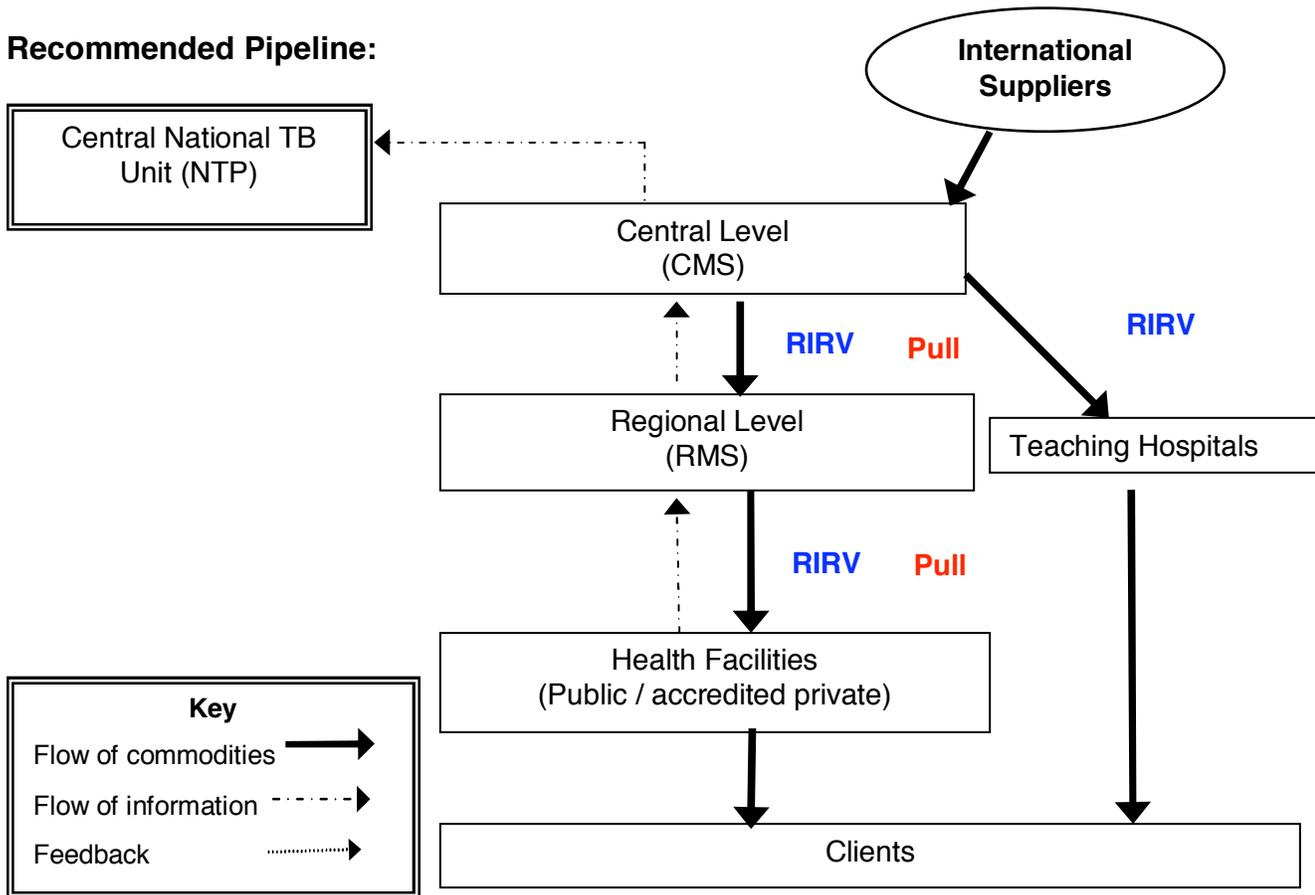
In designing the ICS participants had to consider how commodities and information should flow through the system, how the order quantities are to be determined, when the order will be placed and how to avoid stock imbalances.

Flow of Commodities and Information

Participants reviewed the current flow of commodities and information (or the pipeline) and made slight alterations to simplify the pipeline. The pipeline was redesigned to reflect the in-country pipeline for public health sector commodities. The public health sector commodity pipeline has three levels with the district and sub-districts as one level termed health facilities. In the previous TB system there were four levels with the districts and sub-districts separated. (See Annex C). In reality in most sub-districts TB medicines will not be stored but treatment kits will be dispensed for individual patients at the district hospital pharmacy when the patient is diagnosed and the medicines sent to the facility for DOTS.

A detailed explanation of how commodities and information flow between levels of the health system are included in the SOP manual. The SOP manual outlines the responsibilities of each person in the logistics system including who is responsible for issuing, receiving, compiling reports and providing monitoring and feedback within the system.

Recommended Pipeline:



Inventory Control Parameters

The purpose of an inventory control system (ICS) is to determine when stock should be ordered, how much stock should be ordered and to maintain an appropriate stock level of all products to avoid shortages and oversupply. By establishing maximum, minimum and emergency order point stock levels and routine monitoring of consumption and stock on hand, it is possible to monitor stock levels to avoid overstocking and expiry, and to ensure a continuous supply of quality TB commodities.

A forced ordering maximum-minimum inventory control system was chosen by the participants. A forced ordering ICS compels all facilities to order based on a set frequency. The review period in a forced ordering system is also the order interval. In this system it was recommended that at the regional level the order interval (review period) would be quarterly and at the health facility level the order interval would be monthly.

The “pull” or requisition system will be used at each level, which means that facilities will determine the re-order quantities for their facility. Re-supply quantities in a forced ordering system are determined by establishing the maximum stock quantity for each product and subtracting the current stock on hand. The maximum stock quantity is determined by calculating the average monthly consumption from the previous three months and multiplying by the maximum stock level.

The maximum stock level is based on the lead time, review period and safety stock levels. The lead time is the time interval between when new stock is ordered and when it is received and available for use. As there were participants from all levels of the health system lead times were determined based on their experiences working on the ground.

At the health facilities commodities can generally be sourced quickly (within days) but to ensure that the longest lead time for any health facility in Ghana was accounted for it was necessary to have a lead time of two weeks. At the Regional level it was agreed that the longest lead time for collecting or receiving commodities from CMS was one month.

Safety stock levels were determined using the rule of thumb of half the review period. As the logistics system develops this will be reviewed and a more accurate safety stock level established.

If all products are brought up to the maximum stock level at the beginning of the review period then there should be adequate stock for the entire review period. However, it is still important to put into place an emergency order point at all levels of the system in case something unexpected occurs. The emergency order point indicates that a facility must place an order immediately or risk stock out. The emergency order point is based on the longest lead time for receiving an emergency order for all facilities across the country.

At the health facility level it was agreed that emergency stock can generally be retrieved within a day or two but to account for the longest possible lead time the emergency stock level was set at one week. For the regional level one month emergency stock level was established to account for all regions throughout Ghana. TB commodities must be kept in full supply.

As the TB services in Ghana are likely to expand (it is estimated by WHO that only around 20% of all true cases are detected in Ghana) it is essential that a robust inventory control system be put in place. The absence of a standardized inventory control system for TB medicines in Ghana has meant that accurate stock monitoring has not been possible and reorder quantities have been based on the number of patient cases in the previous quarter plus a little extra as safety stock. With the establishment of maximum stock levels and emergency order points facilities will be able to assess their stock status at any point in time and determine if action is required to avoid stock imbalances.

The parameters determined by the participants are as follows:

FINAL DECISION TABLE OF REFERENCE

Levels	Review Period (Months)	Lead Time (Months)	Safety Stock (Months)	Max (Months)	Min (Months)	Emergency Order Point (Months)
Central	6	9	3	18	12	9
Regional	3	1	1.5	6	3	1
Health Facility	1	0.5	0.5	2	1	0.25
Total				26		

C. Further Recommendations

Further Recommendations by Participants

Pharmacist at NTP

The participants identified the need for a pharmacist at the National TB Control Program. The pharmacist would serve as a Logistics Coordinator. The Logistics Coordinator would be responsible for monitoring the TB logistics system and national stock levels. This will involve working closely with development partners to monitor the stock levels through out the system, prepare annual quantification and procurement planning and update this plan half yearly using current data. The logistics coordinator will also be responsible for overseeing the entire logistics system, providing feedback to regional centres and addressing major TB logistics reporting and distribution issues.

Improving communication between CMS and NTP

Two suggestions were made to improve communication between CMS and NTP regarding the stock status of TB medicines to allow better management of the commodities.

The first recommendation was that the Sectional Head at CMS should receive a copy of contracts for upcoming shipments of TB medicines. This would allow for monitoring of CMS stock levels and enable the Sectional Head to alert NTP of stock imbalances, such as overstocking or under-stocking of commodities.

The second recommendation involved linking the NTP with the planned CMS Computerized Logistics System. The CMS and RMS will soon be linked via a computerized logistics system enhancing the management of commodities between these two levels. It would be an advantage if NTP could also have access to the information so that at any stage NTP can have an accurate picture of the stock status of TB commodities in Ghana.

Implementing scheduled shipments for TB medicines

Scheduled shipments of commodities allows for accurate order quantities based on recent information that results in less stock imbalances. Scheduled shipments means that a one or two year order is placed with a manufacturer but the manufacturer ships only a half or quarter of the full supply at six monthly intervals. The order quantities may then be adjusted, either up or down, by the requesting country before each six month shipment.

By implementing scheduled six month shipments NTP can review the current forecast every six months with recent logistics information and adjust the order quantities to reflect any changes in consumption. As a result it is possible to avoid overstocking or under-stocking of commodities as shipment quantities are based on recent information.

Ongoing logistics training for staff at all levels of the system

To ensure successful implementation of this new system it will be essential to have ongoing training in logistics of all staff at all levels of the system.

Other Recommendations by Technical Advisors

Review of Units of Measure

In designing the system participants decided on using one full kit as the unit of measure for recording and reporting purposes rather than tablets, capsules or blisters. However there is only one size kit and it is for one particular weight band, if a patient is outside that weight band then the kit must be broken and tablets added or subtracted. As some people require 1.33 kits and others require 0.66 kits it may be difficult to capture true consumption by using

kits as the unit of measure. Generally it is recommended that if a container must be broken then the unit of measure should be the smallest unit, such as a tablet or capsule.

The rationale by participants for choosing this unit of measure is that the kit was implemented to simplify the system and to report using tablets would create complication again. It was also decided that the number of patients outside the weight band for which the full kit is designed is small and therefore would not greatly affect consumption rates.

It is recommended that this unit of measure be reviewed six months after the system has been implemented to ensure that the data collected is accurate and reflects true consumption.

Review of Lead Time for Central Level

The lead time is the time taken from the moment the order request is completed to the time when the stock is available for use. The lead time for the central warehouse in this design is nine months and is based on a six monthly order with allowances for delays in shipments.

If scheduled six monthly shipments are achieved then the lead time will in fact be less than the nine months predicted as order quantities will be confirmed only one or two months prior to shipment. But as there have not been scheduled shipments previously it was decided that the lead time should be overestimated to allow for unexpected delays.

The lead time determines the maximum stock level and therefore if it is too long then the maximum stock level will be too high and there is a risk of overstocking. It is recommended that the lead time be reviewed six months after the system has been implemented to ensure it reflects the true situation.

IV. NEXT STEPS

It is recommended that the system outlined in this document be implemented within the next six months so that much needed essential data can be available to assist in quantification, procurement planning and management of TB commodities. This will enable NTP to:

- ensure a continuous supply of TB commodities for the national program in the short and medium terms,
- assess the national stock status of TB commodities regularly and reduce stock imbalances of TB commodities throughout the country,
- institutionalize technical capacity in forecasting, quantification, supply planning, and inventory management of TB medicines, and
- ultimately achieve long-term sustainability and success of the national program.

A second technical assistance visit is recommended to consolidate the deliverables that have been achieved during this recent visit. The technical assistance activities for the next visit will include:

- follow-up on implementation of the recommendations from the first technical assistance visit,
- finalize the Standard Operating Procedures Manual,
- develop training curriculum for the newly designed system, and
- implement a roll out plan.

The table below summarizes the key follow-on activities that should be undertaken as next steps for further improving the TB commodities logistics system in Ghana.

FOLLOW-UP ACTIONS NEEDED

Action	Person (s) Responsible	Estimated Completion Date	Location of Work
Standard Operating Procedures	USAID DELIVER PROJECT /NTP/MOH	April 2008	Washington/ Namibia / Ghana
Developing training curriculum and manuals for new design	USAID DELIVER PROJECT	June 2008	Washington
Print out of materials(SOP, forms, Training manuals)	NTP	July 2008	Ghana
Pilot Curriculum	USAID DELIVER PROJECT	July 2008	Ghana
Roll out training	NTP	July - August 2008	Ghana
Review of Logistics System	USAID DELIVER PROJECT / NTP	January 2009	Ghana

Annex A: Assessment Tool

Ghana TB Logistics System Design Assessment Tool

QUESTIONNAIRE

1. Date _____			2. Interviewer(s) _____		
3. Central _____		4. District _____		5. Health Center _____	
6. Type of structure: a) Place where service is done b) Health Center/ District Warehouse c) Central Warehouse					
7. Name of the structure: _____					
8. Start of Interview _____			9. End of Interview _____		
10. Names of people met:					
	<u>Name</u>	<u>Title</u>	<u>Number of Years</u>		
a)	_____	_____	_____	years/months	
b)	_____	_____	_____	years/months	
c)	_____	_____	_____	years/months	
d)	_____	_____	_____	years/months	
e)	_____	_____	_____	years/months	
f)	_____	_____	_____	years/months	
g)	_____	_____	_____	years/months	

No	Question (and instructions)	Response
11.	Note the category and number of staff by category <i>(Use numbers only, no names)</i>	Category # of staff 1. _____ _____ 2. _____ _____ 3. _____ _____ 4. _____ _____ 5. _____ _____
12.	Have you ever been trained in logistics** (which product), and when? **Logistics tasks include ordering, reception, stocks management, and supervision.	Category Date of last training 1. _____ _____ 2. _____ _____ 3. _____ _____ 4. _____ _____ 5. _____ _____ 6. _____ _____ 7. _____ _____ 8. _____ _____
13.	What were the parts of the training? <i>(Ex. LMIS, transportation, storage, how to fill out the forms and reports, storage conditions, etc.)</i>	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____
Which forms do you use for logistics?		
Please circle		Comments
14.	How do you use the information filled out on the forms? a) Calculation of consumption b) Evaluation of needs c) Report to higher level d) Order from higher level e) Other ; please explain	
15.	At what frequency do you send reports to the higher level? a) Monthly b) Quarterly c) Biquarterly d) Annually e) Other ; please specify	Comments

<p>16. At what frequency should you send them?</p> <p>f) Monthly</p> <p>g) Quarterly</p> <p>h) Biquarterly</p> <p>i) Annually</p> <p>a) Other, please specify</p>	
<p>17. Who determines the quantity to reorder for this institution?</p> <p>a) Is it the institution itself (requisition)?</p> <p>b) Is it the institution at the higher level (allocation)?</p> <p>c) Other, please explain</p>	
<p>18. How is the quantity to reorder calculated?</p> <p>a) A formula</p> <p>b) By the higher level (Go to Q 22)</p> <p>c) Other (Go to Q20)</p>	
<p>19. Which formula? (If formula used, go to Q21)</p>	
<p>20. If it's another formula, say which. (Briefly describe what is done. If anything can be done, say it).</p>	
<p>21. Which data are used to calculate the quantity to reorder? Note everything that concerns the institution:</p> <p>a) Stock at the start of period</p> <p>b) Stock at the end of period</p> <p>c) Received quantity</p> <p>d) Distributed quantity</p> <p>e) Losses and adjustments</p> <p>f) Other, please specify</p>	
<p>a)</p>	
<p>22. How does your order reach you?</p> <p>a) The institution goes to look for it</p> <p>b) The higher level brings it</p> <p>c) Other, please</p>	
<p>23. When did you receive or organize your last supervision visit?</p> <p>a) During the preceding month</p> <p>b) During the last 3 months</p> <p>c) During the last 6 months</p> <p>d) Other (explain)</p> <p>e) Never (If never or N/A go to Q27)</p> <p>f) Question doesn't apply</p>	
<p>24. Who was the supervisor?</p>	

<p>25. What did you do during the supervision visit ?Mark everything that applies:</p> <ul style="list-style-type: none">a) Revise the level of stocksb) Revise les stock forms against the physical inventoryc) Expired products were separated from the othersd) Revision of the reports of SIGLe) Unorganized trainingf) Other, please explain	
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27. TABLE OF STOCKKOUTS

- Note whether there was a product stockout in the last 6 months in Column 3 and at the time of the visit in Column 4.
- Note the date (right or estimated) of the stockout in Column 5, and the date of stockout end in **column 6**.
- Check Column 7 if the stockout date was removed from the stock forms, or check Column 8 if the stockout date is an estimation.
- Note in **Column 9** the list number at the bottom of the table that corresponds to the reason of the stockout.

◆ **Note: It is possible to use more than one line per product if, for example, there was more than one stockout in the last 6 months.**

Products	Form of available stock (O/N)	Sstockout in the last 6 months (O/N)	Stock at the time of the visit (O/N)	Date of the start of the stockout	Date of the end of the stockout	Source of information		Reason of stockout
						Form of the stock	Knowledge of the informant	
1	2	3	4	5	6	7	8	9

Id

1= Unable to collect the product

2= Higher level didn't send right quantity

3= Increased consumption

4 = Didn't order right quantity on time

5= Other reasons

29. Storing conditions

To check Yes, all products and boxes should be in the described conditions.

	Yes	No	Comments
1.			Products to be distributed are placed in such a way that identification forms and expiry/manufacture dates are well visible.
2.			Products are stocked in a way to help make sure that first expired-first out for the deduction and distribution.
3.			Boxes and products are not in a bad shape because of a bad storage. If the boxes are open, the products are not wet or spoiled by heat (broken pills). Condoms are stored far away from fluorescent lights.
4.			Damaged or expired products are separated from other products and no longer appear on the inventory.
5.			Products are not exposed to direct sunlight at all times during the day and during all seasons.
6.			Boxes and products are protected against water and humidity.
7.			Storage area is free from insects and all small worms.
8.			Storage area is locked, but is accessible during work hours, and access is limited to authorized personnel only.
9.			
10.			Dangerous trash, (like syringes) is correctly managed and isn't accessible to non-medical personnel.
11.			The roof is in good shape and can protect the warehouse from light and water at all time.
12.			The warehouse is well maintained (clean, nothing on the ground, strong shelves, boxes in order, etc.)
13.			Available space and is large enough for existing products and may receive new products programmed in the near future.

These additional standards may apply to any rather large warehouse where boxes must be placed over each other.

No.	Description	Yes	No	Comments
14.	Products are placed at least at 10 cm from the ground.			
15.	Products are placed at least at 30 cm from walls and from other stacks.			
16.	Stacks of products don't go beyond 2,5 m high.			
17.	Fire control materials are available and accessible.			
18.	Products are stocked away from insecticides and chemical products.			

28.	What can you do to improve products availability?		
29.	A part from 'more staff' and 'better salary' what kind of help do you need for a better logistics management?		
30.	Ask the interviewees if they have questions to ask you.		

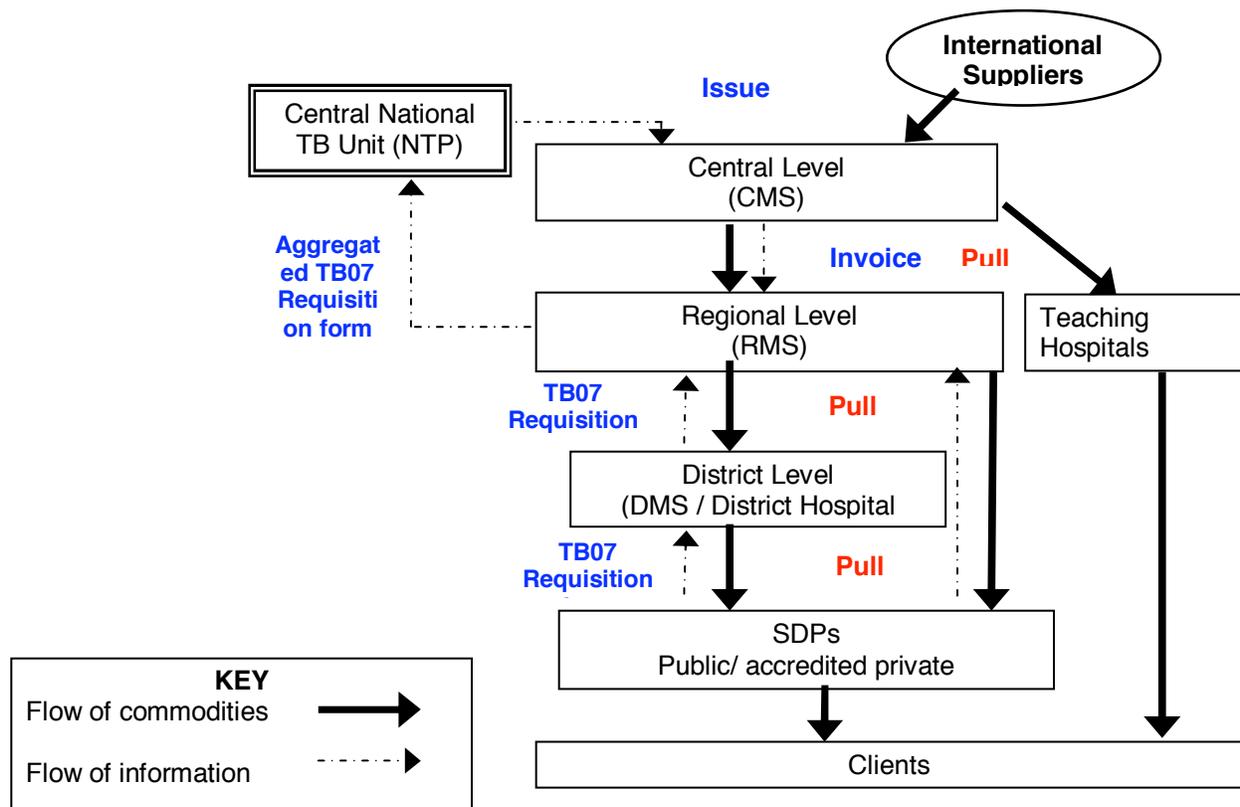
Annex B: List of Key Persons Interviewed

Name	Facility	Title	Contact
Millicent Appiah	Regional Medical Stores	Manager of RMS	mippiah@yahoo.com
Felix Afutu	National TB Control Program	Monitoring and Evaluation	kwami.afutu@ghgmail.org
Mr Felix D Yellu	Pharmacy Council	Chief Pharmacist	+233 21 681 929
Samuel Boateng	Ministry of Health	Director of Procurement and Supply	
Dr Frank Bonsu	National TB Control Program	Program Manager	
Nana Kodua	Christian Medical Centre	Administrator	
Josephine Sekoh	Christian Medical Centre	Senior Staff Nurse, TB Coordinator	
Sylvia Cochrane	La General Hospital	TB Coordinator	
Jonathon Nee-Ashie	La General Hospital	Volunteer, Retired Environmental Officer	
Mabel Donor	La General Hospital	Treatment Room Nurse	
Peter Gyimah	Central Medical Stores	Director CMS	petergyimah@gmail.com +233 22 20416
Victoria Frimpong Anning	Central Medical Stores	Supply Officer	
K. Addai-Donkoh	Ghana Health Service	Director, Supplies, Stores and Drug Management	+233 21 767 401
Phyllis Appiah-Kusi	Kokrobite Community Clinic	Principal Enrolled Nurse	
Lucy Nyalemegb	Kokrobite Community Clinic	Community Health Nurse	
Jonathon Comey	Kokrobite Community Clinic	Medical Assistant	

Annex C: Key Findings in the Existing System

Below are the logistics observations that the consultants got from the sites visits on the existing system.

Existing Pipeline



Reporting

- Reporting from lower level facilities is not timely. Facilities often pick up their medicines without reports.
- A copy of the report is not kept at the submitting level.
- Report on number of cases and treatment outcomes.
- Reporting to a higher level is done on a quarterly basis.
- No consumption or dispensed to user data is collected. No LMIS forms exist for TB.

Ordering

- Order quantities are based on aggregated number of cases for the region and stock on hand.
- Some facilities at community health clinics order when needed, some only order once a case has been diagnosed, some facilities keep a small amount of stock.
- Many facilities use a requisition form to order medicines.

- The Requisition form from RMS goes to the NTP who verify the quantities and write an issue voucher that is sent to CMS to enable issuing of the requested product.
- The RMSs are officially meant to order quarterly, but according to CMS stock cards they actually order every 1-2 months.

Inventory Control

- No inventory control system in place; there is no maximum and minimum stock levels defined at any level of the system.
- No emergency order point.

Delivery and Transportation

- Health facilities collect their own medicines.
- In the Accra Region - there are no formal arrangement for the movement of commodities from CMS to RMS, if someone from CMS is available they will deliver or the RMS will pick up.

Storage

- Storage space at Accra RMS was inadequate. Temperature was not controlled. All commodities were placed above the ground.
- Storage space at La District Hospital Pharmacy was inadequate.
- At SDP stock kept in filing cabinet in locked room or in locked cabinet.
- CMS had plenty of space for storing commodities. All products were kept on pallets.
- Some SPDs keep a small amount of emergency stock otherwise they only keep medicines for particular patients.
- No stock cards in place in SDPs where small excess stock is kept.

Supervision

- SDPs are supervised by the district 3-4 times a quarter. Supervisor checks records. Supervisor listens to the challenges.
- Districts are supervised by Regional TB Coordinator, Supervision occurs at least every quarter.

Annex D: Workshop Schedule

Logistics System Design Workshop for TB Commodities Dodowa, Ghana, March 2008					
	Day 1	Day 2	Day 3	Day 4	Day 5
	8:30 – 10:30	8:30 – 10:30 Framing: 15 minutes	8:30 – 10:30 Framing: 15 minutes	8:30 – 10:30	10:00 – 12:00am Accra
	Introduction to the design: Ice breaker; Expectations; Goal; Objectives; Schedule; Norms	Inventory Control System (Assessing Stock Status)	Group Activity	Refine and review in groups + Preparation of final presentation	Final Presentations from MOH, NTP and other stakeholders.
	10:30 – 11:00	10:30 – 11:00	10:30 – 11:00	10:30 – 11:00	
	Break	Break	Break	Break	
	11:00 – 13:00	11:00 – 13:00	11:00 – 13:00	11:00 – 13:00	
	Introduction to logistics	Inventory Control System (MaxMin)	Group Activity	Practice of final presentation	
	13:00 – 14:00	13:00 – 14:00	13:00 – 14:00	13:00 – 14:00	
	Lunch	Lunch	Lunch	Lunch	
	14:00 – 15:30	14:00 – 15:30	14:00 – 15:30		
	Introduction to LMIS (3 essential data)	Participants present their system / Trainers present findings + Explain Group Session Design Activities; Groups, Process, Outcomes	Summary of Group Activity – ICS	Leave for Accra	
	15:30 – 15:45	15:30 – 15:45	15:30 – 15:45		
	Break	Break	Break		
	15:45 – 17:00	15:45 – 17:00	15:45 – 17:00		
	LMIS (3 types of records)	Group Activity	Summary of Group Activity – LMIS		
	17:00-17:15	17:00 – 17:15			
	Feedback	Daily Evaluation	Take Group Pulse		

Annex E: Goals and Objectives of Workshop

LOGISTICS SYSTEM DESIGN WORKSHOP FOR TB MEDICINES

GOAL: To design the logistics system for TB medicines.

OBJECTIVES:

After completing all the sessions, the workshop participants will be able to:

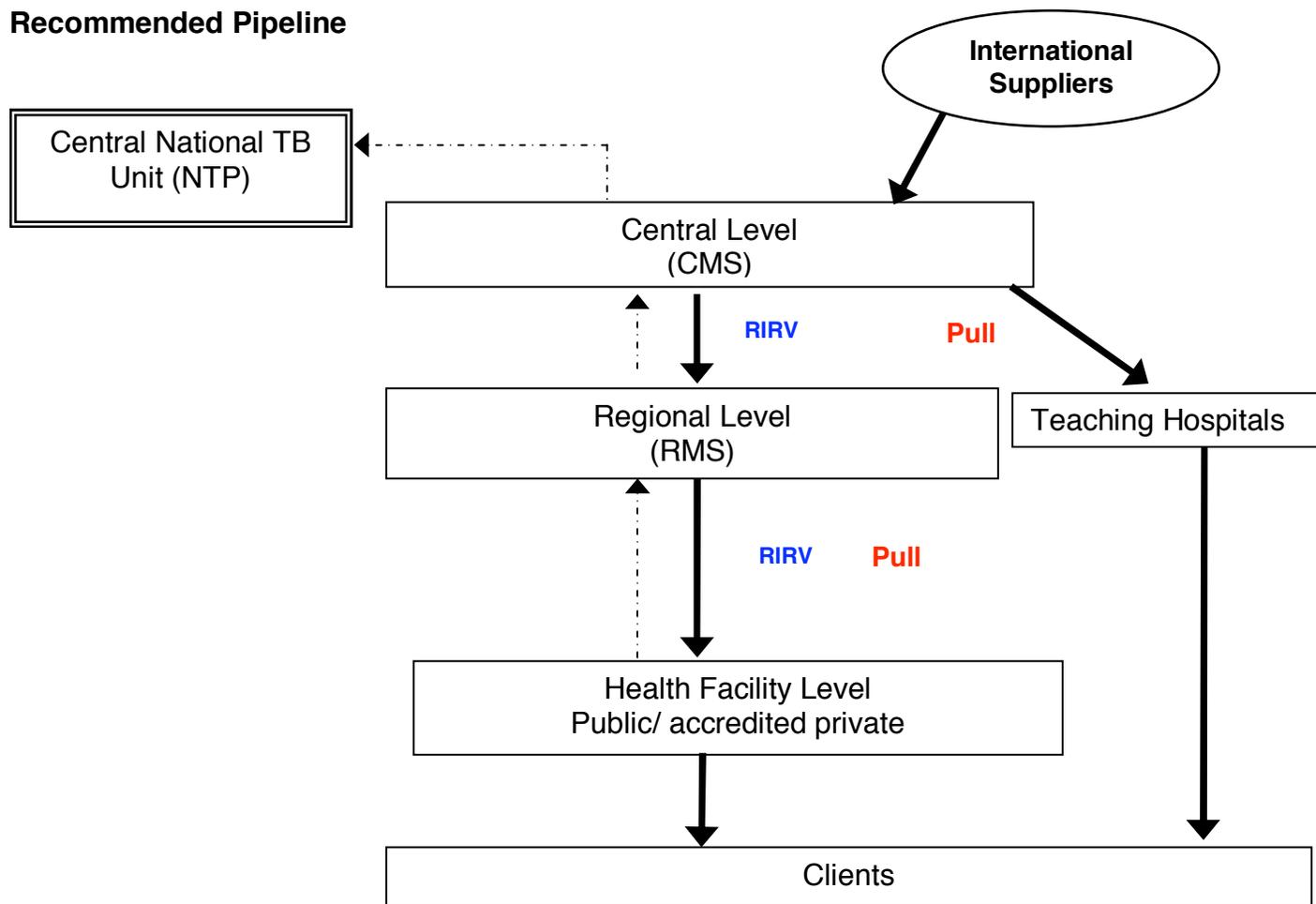
- 1- Understand and use basic logistics concepts needed for designing an inventory control system and an LMIS
- 2- Map the current TB medicines Logistics System(s) and the flow of TB medicines from the sources to the Clients. Show on the map(s) how the commodities flow through the current system(s) as well as how information flows
- 3- Identify and record strengths and weaknesses in the current flow of the commodities as well as in the flow of information
- 4- Develop/ Review the LMIS system for TB medicines (including the development of data collection supports and reporting systems)
- 5- Develop an inventory control system to manage TB medicines (the levels of the system to be involved, the frequency of ordering, the ideal max-min months of stock at each level, the overall length of the pipeline, how order quantities should be determined)
- 6- Clearly define roles and responsibilities in managing the supply chain of TB medicines.
- 7- Develop a realistic training implementation plan to train the new system. (Determine the correct people to invite to training and develop an outline of activities)

Annex F: Participants in Workshop

	Name	Title	Institution
1	Abass Quainoo	Senior Storekeeper	District Health Administration Stores
2	Ahmed Iddison	Logistics Officer	GHS / National TB Control Program
3	Albert Netey	Program Officer	USAID I DELIVER PROJECT Ghana
4	Barbara Bentum	District Pharmacist	Dodowa District, GHS
5	Daniel Darko	Chief Biostatistics Officer	PPME, GHS
6	Eugene Essegbey	Pharmacist	KBTH
7	Felix Afutu	Program Officer M&E	National TB Control Program
8	Festus Kofi Sroda	Biomedical Scientist	Public Health Laboratory, Ashanti, GHS
9	Festus Korang	Principal Pharmacist	GHS headquarters
10	Francis Ashagbley	Program Officer	USAID I DELIVER PROJECT, Ghana
11	Francis Frimpong-Asamoah	Principal Pharmacist In-Charge	Cape Coast District Hospital
12	George Nana Yaw Yeboah	Pharmacist	Ga West District, Greater Accra, GHS
13	Joyce Ashong	Supply Officer	Central Medical Stores
14	Lazarus Baba Anambesi	Pharmacist	Pharmacy Unit GHS
15	Mabel Tetteh	Program Officer	National TB Control Program
16	Manfred Abudet	Principal Pharmacist	RMS, Ho /GHS
17	Millicent Appiah	Pharmacist	RMS, Accra / GHS
18	Naana Frempong	Pharmacist	Procurement Unit / MOH
19	Prosper Kutame	Head	GHS Headquarters Stores
20	Samuel Boateng	Municipal Pharmacist	Municipal Health Directorate, New Juaben, Koforidua, GHS
21	Stanley Mangortey	Program Officer	National TB Control Program
22	Victoria Frimpong Anning	Supply Officer	Central Medical Stores

Annex G: Recommendations from System Design Workshop

Recommended Pipeline



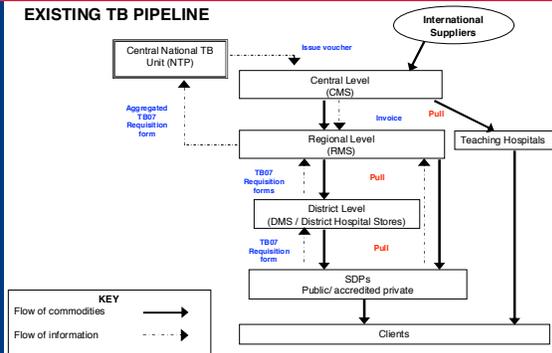
Recommended Inventory Control System

Levels	Review Period (Months)	Lead Time (Months)	Safety Stock (Months)	Max (Months)	Min (Months)	Emergency Order Point (Months)
Central	6	9	3	18	12	9
Regional	3	1	1.5	6	3	1
Health Facility	1	0.5	0.5	2	1	0.25
Total				26		

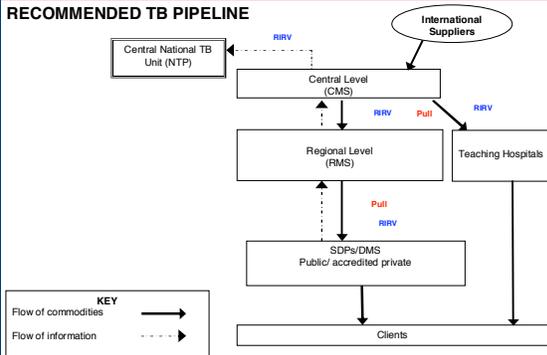
PARTICIPANTS

- Representatives from the National TB Program, MOH/GHS, Regions, Districts, Central Medical Stores, Procurement Unit, Teaching Hospitals.
- Pharmacists, TB Coordinators, Stores Managers, Supply Officers, Program Officers, Logistics Officer.

EXISTING TB PIPELINE



RECOMMENDED TB PIPELINE



INVENTORY CONTROL SYSTEM

Levels	Review Period (Months)	Lead Time (Months)	Safety Stock (Months)	Max (Months)	Min (Months)	Emergency Order Point (Months)
Central	6	9	3	18	12	9
Regional	3	1	1.5	6	3	1
SDPs/DMS	1	0.5	0.5	2	1	0.25
Total				26		

LMIS

EXISTING SITUATION ON LMIS

- Stockkeeping Records
- Inventory Control Card
 - Tally Card
- Transaction Record
- Issue Voucher
 - Invoice
 - Requisition form
- Consumption Records
- No current record
- LMIS Report
- No current LMIS report

NEXT STEPS

- Finalize Standard Operating Procedures, including Job Aids
- Print forms
- Conduct training of trainers
- Roll out
- System assessment
 - Timeline to be finalized with NTP and USAID I DELIVER PROJECT

THANK YOU FOR YOUR ATTENTION



Feedback from participants:

- Effective teaching methodology.
- Closed on time.
- It's been worth learning something new on the essence of LMIS to improve productivity at the end of the day.
- Excellent workshop, I think it should be sustained.
- I'm impressed by the overall performance of the day.
- Facilitators delivered while participants also kept to the Norms of the workshop. Keep it up!
- Congratulate the team and facilitators for their valuable ideas and efforts put in to come up with a proposed system of the LMIS, to create efficiencies at all levels in the handling and dispensing of TB medicines in Ghana.
- Good work done within a very short time – congrats.
- Restaurant is perfect; water for the bathing is not good. Teaching and participating well organized.
- I'm quite impressed by the organization and all the various sessions of the program.
- I congratulate all the organizers and the facilitators of the program for a good work done. Thanks.
- I like the work done by the Consultants and their neutrality. I hope their work done will not be shelved.

VI. REFERENCES

Takang, Eric, Katungire, Tsitsi, Mwiroti, Amanda, and Bruce, Egbert. 2007. Ghana: ARV and HIV Test Quantification Review and TB Drug Quantification and Supply Planning, June 2007. Accra, Ghana: Ministry of Health and Ghana Health Services—Ghana.

Ghana Health Services: Logistics Management of Public Sector Health Commodities in Ghana, Standard Operating Procedures. 2002.

National Tuberculosis Control Program: Managing Tuberculosis in Ghana, A Training Course, Ghana Health Services. 2006.

National Tuberculosis Control Program: Managing Tuberculosis in Ghana, Desk Aide, Ghana Health Services. 2006.

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