

Uganda

Estimation of Commodity Requirements Needs for 2002–2003

Drugs to Treat Tuberculosis

Prepared for the Ministry
of Health, Uganda

Jim Eberle
Yasmin Chandani

April 2002

Uganda Ministry of Health



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DELIVER

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Abstract

Describes the sequence of events, in 2002, when the Ugandan Ministry of Health (MOH) asked the DELIVER/Uganda project to help coordinate the quantification of commodities required for by HIV/AIDS programs. In this final report, DELIVER technical advisors estimated requirements related to tuberculosis treatment and outlined gaps in the supply system for relevant commodities. Included is a description of the logistics systems for the MOH's TB program, whose structure has been maintained to this day.

Uganda Ministry of Health



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Contents

Acronyms.....	v
Acknowledgements.....	vii
Executive Summary	ix
Background.....	1
Overview: Commodity Financing in the Public Sector.....	3
1. Essential Drugs	3
2. Sexually Transmitted Infection and Opportunistic Infection Drugs.....	4
3. Malaria Drugs	4
4. Tuberculosis Drugs	5
5. HIV Test Kits.....	5
Description of Tuberculosis Program for Ministry of Health and Nongovernmental Organizations	7
1. Infrastructure.....	7
1.1. Managerial Organization	7
1.2. Program Structure at Health Facilities and Below	7
2. Case Detection and Treatment	8
2.1. Case Detection	8
2.2. Treatment Guidelines	8
3. Commodities	8
3.1. Tuberculosis Drugs	8
3.2. Laboratory Materials for Microscopy	9
4. Information System.....	10
4.1. Health Facility Level	10
4.2. District Level	10
4.3. Zonal Level	11
4.4. National Level	11
5. Supply and Logistics.....	11
5.1. Funding Sources for Tuberculosis Drugs	11
5.2. Procurement Sources for Tuberculosis Drugs	11
5.3. Quantification Method Used by Tuberculosis Program to Estimate Nationwide Tuberculosis Drug Needs	12
5.4. Quantification Method Used by Zonal/District Level to Estimate Quarterly Tuberculosis Drug Need for Districts/Health Facilities.....	12
5.5. Storage and Distribution of Tuberculosis Drugs	13
Quantification of Drugs for Tuberculosis Treatment	15
1. Background.....	15
2. Assumptions Made by Tuberculosis Unit during the Quantification Exercise	15
3. Evaluation of Quantification	16
Recommendations	17
1. General Recommendations	17
2. Tuberculosis Program	17
Quantification	17
Procurement and Financing.....	18
Distribution and Storage	18
Information Systems	18
People Contacted.....	21

Acronyms

ACP	AIDS Control Program
AIC	AIDS Information Center
AIDS	acquired immune deficiency syndrome
AIM	USAID-funded district based AIDS project
CDC/GAP	Centers for Disease Control and Prevention/Global AIDS Program
CQ	chloroquine
DANIDA	Danish International Development Agency
DDHS	Directors District Health Services
DFID	British Department for International Development
DHT	District Health Team
DOTS	directly observed treatment short-course
DTLS	District Tuberculosis and Leprosy Supervisor
ED	essential drugs
EDP	essential drug program
EGPAF	Elizabeth Glaser Paediatric AIDS Foundation
EU	European Union
GDF	Global Drug Facility (Stop TB Partnership)
GFATM	Global Fund for AIDS, TB and Malaria
GLRA	German Leprosy Relief Association
GOU	Government of Uganda
HC	health center
HIV	human immunodeficiency virus
HIV/AIDS	see HIV and AIDS
HSSP	DANIDA-funded Health Sector Support Project
JMS	joint medical stores
JSI	John Snow, Inc.
MAP	Multi Country AIDS Program
MOH	Ministry of Health
NBTU	Nakasero Blood Transfusion Unit
NDA	National Drug Authority
NGO	nongovernmental organization
NMS	National Medical Stores
NTLP	National Tuberculosis and Leprosy Program
OI	opportunistic infection
PHC	primary health care
PHC-CG	primary health care conditional grants
PMCT	preventing mother-to-child transmission
PMO	Program Manager Officer
PSI	Population Services International
RI	rifampicin/isoniazid
SP	sulphadoxine-pyrimethamine
SMO	Senior Medical Officer
STI	sexually transmitted infection
SWAp	Sector Wide Approach
TASO	The AIDS support organization
TB	tuberculosis
UAC	Uganda AIDS Commission

UHSSP	Uganda Health Sector Support Project
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
VCT	voluntary counseling and testing (HIV)
WHO	World Health Organization

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The views stated in this report are those of the authors, and do not necessarily reflect the views of the U.S. Agency for International Development or the Uganda Ministry of Health.

Executive Summary

As of April 2002, the Tuberculosis (TB) Program of the Ministry of Health (MOH) was carrying only enough pharmaceuticals to meet expected TB patient requirements through July 2002.

Without the expected delivery of a twelve months supply of isoniazid+ethambutol blister packs and rifampicin+isoniazid+pyrazinamide+ethambutol blister packs in July 2002 (through Multi Country AIDS Program [MAP] financing), there will be a complete stockout of both critical commodities in July and September 2002, respectively. Because of the seriousness of the situation, it is recommended that the MOH immediately approach other donors to supply at least six months worth of rifampicin+isoniazid+pyrazinamide+ethambutol (21,000 blister packs) and isoniazid+ethambutol (21,000 blister packs). These supplemental shipments should arrive prior to July 2002.

The MOH is presently stocked out of rifampicin+isoniazid 150/100 mg tablets (used to supplement retreatment and children's cases). Although the German Leprosy Relief Association (GLRA) has already committed to delivering 2 million tablets of rifampicin+isoniazid, they should be reminded of the urgency of making the delivery as soon as possible.

Presently, there are adequate supplies of pyrazinamide 150 mg tablets, ethambutol 400 mg tablets, and streptomycin 1 gm vials to supplement retreatment and children's cases. Care should be taken to ordering avoid additional amounts of ethambutol through MAP or the Global Drug Facility (GDF). If this has already been done, the shipments should be delayed.

Other recommendations include the following:

- Given the present shortages and near-shortages in TB drug supply, and the uncertainty in future funding, it would be prudent for the TB program to identify possible funding sources for 2003 and approach each source beginning in mid-2002 to secure firm commitments.
- To avoid delays in receiving the items, after tenders have been awarded, the TB program should work with the National Drug Authority (NDA) to ensure that suppliers have products registered in the country or that they start the process immediately.

Several near-term changes can be made to the quantification and procurement process to minimize future shortages and stockouts:

- First and foremost, the TB program should establish a six-month buffer for all commodities and procure enough to maintain this buffer. (This may require another emergency supply of rifampicin+isoniazid 150/100 mg tablets later in 2002.)
- Second, the program should be careful to build an expected a 25 percent increase in coverage of TB cases into the next quantification.
- Finally, the program should undertake quantification exercises biannually.
- In the longer term, to improve distribution, the TB program should begin to use the consumption and stock balance information on the *program management* form. This information, with the stock balance information from the Wandageya and Buluba stores, should be used to estimate need in future procurements.

Background

The Government of Uganda (GOU) estimates that the antenatal human immunodeficiency virus (HIV) prevalence is 6.1 percent, and approximately 1.1 million people with human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) are living in the country. Growing government commitment and nongovernmental organizations involvement, coupled with strong support from international donor organizations, have contributed to both a reduction in prevalence and an increase in HIV/AIDS knowledge and program development. However, there is a need to greatly expand the range and quality of prevention, and care and support interventions to continue the progress.

The availability of HIV/AIDS commodities will be central to the effort to expand the range and quality of services being offered. To ensure the consistent and reliable availability of these commodities to customers, programs must, in the medium- to long-term—

- Be able to quantify their commodity needs.
- Have or mobilize resources to ensure procurement of these commodities.
- Have or access skills to procure these commodities.
- Deliver the commodities reliably to all customers along the supply chain.

Recognizing this, the GOU/Ministry of Health (MOH) has asked the DELIVER/Uganda project to assist in coordinating the quantification of the range of commodities required by HIV/AIDS programs. This quantification will provide a detailed justification for all HIV/AIDS commodity requirements across both the public and civil society sectors for 2002 and 2003. Currently, there are several funding sources that are and can be used to procure commodities for HIV/AIDS programs, including the MOH budget; the World Bank-supported Multi Country AIDS Program (MAP); funds from the Global Funds for AIDS, Tuberculosis and Malaria (GFATM); and resources from donors and foundations. Direct inputs in the form of commodities are available from other sources, including the Stop TB Partnership's Global Drug Facility (GDF). Without a systematic attempt to quantify commodities for all HIV/AIDS programs and a coordination of procurement and ordering, however, there is a great risk of less than optimal use of resources through duplicate and incorrect orders.

Many commodities included under the umbrella of HIV/AIDS are already on the essential drugs list; they are used specifically by HIV/AIDS program components (e.g., sexually transmitted infection [STI], tuberculosis [TB], and opportunistic infection [OI] drugs), as well as other purposes. This document will focus on HIV/AIDS program logistics and commodities while referencing other public health commodities, where appropriate, given GOU's long-term goal to integrate supply and logistics systems for health programs.

Key stakeholders involved in implementing HIV/AIDS prevention and treatment programs include the Uganda AIDS Commission (UAC); the Ministry of Health AIDS Control Program (MOH/ACP), and the Uganda Blood Transfusion Unit; nongovernmental organizations (NGOs), including the AIDS Information Center (AIC) and The AIDS Support Organization (TASO); and other cooperating agencies, such as the Centers for Disease Control and Prevention (CDC) and AIM Uganda.

Overview: Commodity Financing in the Public Sector

In general, financing for commodities used in public sector facilities combines MOH and donor funds. Donors can contribute in two ways: (1) through Sector Wide Approach (SWAp) funding via budget support to the Ministry of Finance; or (2) through provision of in-kind contributions, such as direct supplies of commodities to specific programs. To date, there has been no central mechanism or section of the MOH that tracks all the various donor inputs related to commodity supplies. However, DELIVER/Uganda is currently working with the pharmacy section to establish a commodity tracking database that will maintain records of all donor commodity inputs.

The following is an approximate summary of funding sources, by program, for commodities in the public sector in Uganda. The focus is on commodity inputs for lower-level health units (HC II, III, and IV) not on district, regional, or referral hospitals.

1. Essential Drugs

Health units currently obtain essential drugs and supplies in the following ways:

- *Pre-packed essential drug programs (EDP) kits, which are procured centrally and distributed to all public sector health facilities every quarter.* Funding for the 30–40 essential drugs included in the kit came from GOU and Danish International Development Agency (DANIDA), through its Health Sector Support Project (HSSP). The content of the kits has recently been updated to more accurately reflect health facility needs. The supply of drugs in the kit is usually insufficient for health unit needs, as the drugs only last 1–1.5 months.
- *Direct purchases by the district or health units using funds from the primary health care conditional grants.* In theory, after the funds are released, 50 percent are available for drug purchases to supplement supplies in the kit. In practice, delays in the release of funds and reporting requirements on use of the funds have led to limited use of primary health care conditional grants (PHC-CG) for purchasing drugs.

Even if the full amount allocated for drugs from the PHC-CG grants were released regularly, funding is still not sufficient for drug needs at the lower levels. A recent study conducted by MOH/pharmacy section and Uganda Health Sector Support Project (UHSSP) demonstrated that districts require approximately U.S.\$2.40 per capita to provide sufficient commodities for the minimum package of services that GOU has committed to providing for Ugandans. Currently, including all GOU and partner direct and in-kind contributions, only about U.S.\$0.96 per capita is being spent on commodities.

To address the issue of irregular and insufficient supplies, the pharmacy section is planning a phased transition to a comprehensive order-based system for essential health commodities. The transition to the new *pull* system will begin in January 2003. Key elements of the new system include—

- To instill the idea of a *value* for the kit among lower-level health units, DANIDA/GOU funding for essential drugs will be a budget line equal to the value of the imported kit.

- During the transitional period, health units can use the budget line to purchase locally assembled kits until they have sufficient capacity to estimate their requirements and place orders for individual items.
- Eventually, comprehensive orders will be placed using funds from both the essential drugs (ED) budget line and the PHC-CG budget, and each health unit will have a separate account at National Medical Stores/joint medical stores (NMS/JMS).
- Donated products for vertical programs will be integrated onto the order form for the pull system to encourage systematic orders to be placed by each health facility for all its commodity needs.

2. Sexually Transmitted Infection and Opportunistic Infection Drugs

Funding for STI and TB supplies has been erratic in the last several years. Initially, the World Bank STI project (1995–2000) supplied condoms for STI/HIV prevention, drugs for STI syndromic management, TB treatment according to directly observed treatment, short-course (DOTS), and OI treatment. Other donors for these commodities, during the same period included DFID and KfW. These commodities were provided to MOH, NGO, and Mission sites. After the project funding ran out in 2000, a small amount of MOH funds were allocated to purchase STI drugs. This money was never used for STI drug purchases but was reallocated for purchasing essential drug program (EDP) kits.

Consequently, since the end of 2000, there has been no consistent provision of STI drugs to lower levels through the national program because the EDP kits purchased do not contain all the drugs required for syndromic management of STIs. In theory, districts should have been able to obtain these drugs by ordering from NMS using their PHC-CG drug budgets. In practice, release of the primary health care (PHC) grants has not been timely and districts have had difficulties accessing funds after their release. Thus, it is likely that health centers have had inconsistent supplies and shortages of STI drugs. Although TB and malaria drugs were also affected by the shortages in funding, the programs have been able to mobilize other donor resources to ensure provision of supplies.

Between April–July 2002, most of an emergency shipment, valued at U.S.\$1.3 million, of drugs for STI, TB, OI, and HIV test kits; syphilis test kits; and expendable medical supplies arrived, procured through the World Bank-assisted MAP project. Through standard non-emergency procedures, the project has also procured substantial amounts of HIV/AIDS commodities, which will be supplied through the Uganda AIDS Commission and the MOH, starting in early 2003. Although estimates were made of commodities required for treating STIs, TB, malaria, and specialized OIs, this was a budget-driven exercise rather than a systematic quantification of needs for both public and civil society sectors based on demand and a realistic assessment of Uganda's capacity to deliver services and supplies.

3. Malaria Drugs

The main funding source for anti-malarial drugs is the government via budget support to the treasury from donor agencies. This money (the conditional PHC grant) is, in turn, supplied to the district health departments. After district health departments are informed of their allotment, they are required to spend 50 percent of the amount on drugs, part on anti-malarials. Districts and health units also receive anti-malarial drugs in the pre-packed EDP kit.

During a crisis, donor agencies have been known to purchase anti-malarial drugs directly on behalf of the government and supply them to the MOH for distribution. WHO provided this support during a malaria epidemic in the late 1990s. On the whole, however, there is no coordinated approach to donor support of the malaria program.

As of July, with the change in policy of chloroquine (CQ) and sulphadoxine-pyrimethamine (SP) as first-line treatment, the MOH did not plan for additional anti-malarial drugs to be purchased under the MAP project. This has resulted in low stock levels of both first-line and second-line treatment drugs, especially SP. The issue of an impending stockout was discussed at the joint meeting of MOH and donors in April, with both DFID and Irish AID agreeing to step in and fill the gap by purchasing a one-year supply each of SP and quinine, worth \$1.2 million. As an emergency measure, a two-month supply of SP was bought locally and distributed in July and August. Another four-month supply is being air-shipped in, while the remaining six-month supply will come in through a regular sea shipment. Unfortunately, the long registration process for double-scored packs of quinine has resulted in a delay in purchasing and bringing in stop-gap quinine supplies. Details on the quantification can be found in the companion report on anti-malarial drugs.

4. Tuberculosis Drugs

Two main sources have funded TB drugs in recent years: the MOH and the German Leprosy Relief Association (GLRA). The primary source during the later 1990s was the MOH. Between 1995 and 2000, funds from the World Bank STI Project were used to supply TB drugs. GLRA also supplied TB drugs between 1995 and 2000, especially during lapses in the MOH procurement process.

More recently (2001), the TB program has relied on a World Bank Debt Relief Facility and GLRA to supply its TB drugs. Although the TB program expects this to change in the near future through the World Bank MAP project supplies, orders of a one-year supply of drugs through that mechanism have been delayed due to the lengthy registration process for manufacturers for the TB 4 and TB 2 blister packs.

Similarly, suppliers from the Global Drug Facility of the STOP TB Partnership are unable to step in and cover the potential shortage in TB drugs because products from their manufacturing site are also not registered in Uganda and the long registration process is hindering quick action in this area.

The TB program applied for funds through the Global Fund for AIDS, TB, and malaria (GFATM), but, to date, they have not received an award of funds through this mechanism.

A detailed outline of the organizational structure, management, and functioning of the TB program can be found later in this document.

5. HIV Test Kits

In the past, HIV rapid test kits for voluntary counseling and testing (VCT) and preventing mother-to-child transmission (PMCT) were funded by a variety of sources, including [CDC/GAP], [DFID], the NORAD/UNFPA [VCT] Project, UNICEF, and [USAID]. Funding for these services and supplies is currently provided under the following sources: Elizabeth Glaser Paediatric AIDS Foundation (EGPAF), European Union (EU), Irish AID, UNICEF, USAID, and the MAP project. For the National Blood Safety program, the Nakasero Blood Transfusion Unit (NBTU) receives 40 percent of its operating budget from the EU, and these funds are used to procure HIV ELISA test kits for testing donated blood, hepatitis B test kits, and syphilis test kits. The remaining 60 percent of its funding is through budgetary allocations from the MOH, and this money is also used to procure supplies, such as blood bags, reagents, etc. NBTU recently received support from

DFID for an emergency shipment of a three-month supply of blood bags to prevent a national stockout. The certainty of continued EU funding for the program is not assured, and it is important that the unit's supply needs are quantified along with other test kit requirements.

The MOH/ACP will receive some HIV test kits through the World Bank MAP project described earlier. In addition, Uganda recently submitted a Country Proposal to the GFATM, and was awarded \$53 million in August 2002. Approximately 40 percent of the total funding submission will be used for commodity purchase, but detailed quantification of HIV test kits and other supplies is needed before final commodity purchase and detailed procurement plans can be made.

Description of Tuberculosis Program for Ministry of Health and Nongovernmental Organizations

1. Infrastructure

The National Tuberculosis and Leprosy Program (the TB program) is managed from offices of the MOH in Kampala. Within the MOH system, the TB program is run vertically down to the health facility level, at which point tuberculosis counseling and treatment is integrated into the wider range of services provided to patients. NGOs and most faith-based organizations are only supplied by the MOH drug supply system. The MOH does not directly supervise the services provided by NGOs, although it is policy for these organizations to follow the same procedures laid out in this document.

1.1. Managerial Organization

The TB program is run from the Department of National Disease Control of the MOH. It is officially known as the National Tuberculosis and Leprosy Program (NTLP), but only the TB program is described here.

The TB program is overseen by the Program Manager Officer (PMO). Below the PMO are six Senior Medical Officers (SMO) who oversee nine zonal offices. The PMO also directly supervises a principal laboratory technician, a senior laboratory technician, a laboratory technologist, and a laboratory assistant, all working out of the central laboratory in Kampala.

The SMOs are directly responsible for overseeing the TB activities of the Directors District Health Services (DDHS) and District Health Teams (DHT). The DHT is responsible for a large number of health-related activities, including education and training. The main link between the SMOs and district-level TB activities is the District Tuberculosis and Leprosy Supervisor (DTLS). The DTLS is responsible for supervising the TB activities at the health facilities.

Because TB services are integrated with other services at the health facility level, no individuals at this level are supervised by the TB program.

1.2. Program Structure at Health Facilities and Below

Until very recently, the TB program was organized so patients were diagnosed and treated at health facilities throughout the country. Those who were thought to have contracted TB traveled to TB diagnostic units located at hospitals, health center level 3 (HC3), and health center level 4 (HC4) units, to have microscopies done of their sputum smears. Those who were diagnosed with TB were treated as in-patients for two months.

With the introduction of DOTS, diagnosed cases are now treated in their own homes/communities in 22 districts. Under the DOTS program in Uganda, each sub-county of each district employs county health workers. The county health workers are responsible for obtaining needed supplies of TB drugs from their affiliate health center and overseeing their distribution.

County health workers link with community parishes in the field. The community parishes are responsible for selecting volunteers to work with TB patients. The volunteers oversee the administration of the TB drugs to patients in either the patient's home or at a location established by the volunteer. Each volunteer receives a two-week supply of TB drugs from the county health worker. Resupply occurs as necessary.

The DOTS program is scheduled to be implemented nationwide between now and the end of 2003. During this time, health facilities now treating patients in-house will stop offering such services. These hospitals, HC3 and HC4 facilities, will continue to provide diagnostic services.

2. Case Detection and Treatment

2.1. Case Detection

At present, suspected cases of TB are investigated at hospitals and HC3 and HC4 facilities equipped with microscopes to analyze sputum specimens. In general, only smear microscopy is used to detect TB in the public health system. Chest x-rays and culturing of specimens are not normally performed, except at specialist referral centers.

During the course of treatment of a TB patient, up to six sputum specimens will be taken and analyzed. This policy is expected to continue under the DOTS program.

2.2. Treatment Guidelines

The treatment regimes used in the public health system for both the initial and continuation phases of the disease mirror the standard regimes prescribed by the World Health Organization (WHO).

To simplify the treatment of TB patients in Uganda, all new cases are treated with the same regime. Therefore, new cases that are either smear positive, smear negative, or extra-pulmonary are treated similarly. Likewise, previously treated patients are treated with the same regime, whether they are smear positive, have a relapse, or return for treatment after an interruption. See table 1.

Table 1: Treatment Regimes Used in Uganda for TB Cases

Category of Patient	Treatment: Initial Phase	Treatment: Continuation Phase
New cases	2RHZE	6HE
Retreatment cases	2SRHZE/1RHZE	5RHE
Children	2HRZ	4RH

Notes: The number preceding the first letter indicates the duration in months of treatment. R: rifampicin. H: isoniazid. Z: pyrazinamide E: ethambutol. S: streptomycin.

3. Commodities

3.1. Tuberculosis Drugs

Until recently, when the DOTS program was introduced in 22 districts, TB drugs were purchased and distributed in loose tablet or vial form.

The loose drugs are—

- rifampicin 150 mg (R)
- isoniazid 100 mg (H)
- pyrazinamide 500 mg (Z)
- ethambutol 400 mg (E)
- streptomycin 1 gm (S).

Table 2 shows the quantity of each individual drug required per patient to treat new cases, retreatment cases, and childhood cases.

Table 2: Quantities of Drugs (per patient) Used to Treat TB Cases

Drug	New Cases	Retreatment Cases	Children
HR	240 tablets	960 tablets	360 tablets
Z	240 tablets	360 tablets	120 tablets
S		60 vials	
E	180 tablets	720 tablets	
HE	360 tablets		

Notes: R: rifampicin. H: isoniazid. Z: pyrazinamide E: ethambutol. S: streptomycin.

Though the same drugs are still being used to treat TB under DOTS, the TB program now procures the combination RHZE by the box. Each box contains eight blister packs (one for each week of a two-month course to be taken during the initial phase of new and retreatment cases). The TB program also procures the combination HE by the box, with each box containing 12 blister packs (one for each two-week period of a six-month course to be taken during the continuation phase of new cases). Table 3 shows the number of blister packs and loose drugs required per patient to treat cases under the DOTS program.

Table 3: Blister Packs and Drugs (per patient) Used to Treat Cases under DOTS

Drug	New Cases	Retreatment Cases	Children
RHZE blister	8 blisters (1 pack)	12 blisters (1 and ½ pack)	
HE blister	12 blisters (1 pack)		
S		60 vials	
HR		600 tablets	360 tablets
E		450 tablets	
Z			120 tablets

Notes: R: rifampicin. H: isoniazid. Z: pyrazinamide E: ethambutol. S: streptomycin.

3.2. Laboratory Materials for Microscopy

At locations where microscopy services are available, the following consumable laboratory reagents and other supplies are needed per TB patient. See table 4.

Table 4: Reagents and Supplies Needed per TB Patient

Laboratory Reagents	Estimated Quantity per Patient	Laboratory Supply	Estimated Quantity per Patient
Carbol fuchsim	36 ml	Slides	12
Methylene blue	36 ml	Sputum containers	12
Sulphuric acid 25%	15 ml	Immersion oil	1.2 ml
Lysol disinfectant	Unknown	Xylene	12 ml

Note: Each laboratory needs either two- or four-slide packs, depending on the number of slides examined during the last quarter. Each laboratory needs at least two filter papers weekly to filter reagents and lens tissues to clean the lenses of the microscope daily.

4. Information System

In general, the information management system used by the Ugandan TB program is the same as that recommended by the WHO. A brief summary of the system is provided below. Refer to the WHO TB Handbook for more detail.

4.1. Health Facility Level

The record keeping forms used at each health facility for TB are—

1. *TB identity card*: A card held by each patient identifying their current status as a TB patient.
2. *TB patient treatment card*: A card held by the health facility that contains a historical record of the patient's treatment.
3. *TB treatment register*: Data from TB patient treatment cards is compiled in this register, which is the primary source of data for the service statistics information system. It is compiled once a month and sent to the district.

At health facilities where DOTS has been implemented, the community health workers will maintain the TB patient treatment cards.

4.2. District Level

At the district level, the DTLs compile a TB register (similar in appearance to the health facility TB register) from data in each of the health facility TB registers once a month during supervision visits. The information collected on this register is used to complete several reports filed by the district to the zonal level.

1. *District Quarterly Report on New Cases and Relapses of TB*: The district compiles this report that contains the number of pulmonary smear-positive cases (new and relapses), the pulmonary smear-negative cases, and the extra-pulmonary cases. Smear-positive cases are recorded by age and sex; other cases are recorded by sex only.
2. *District Quarterly Report on Programme Management*: The district compiles this report and it contains number of cases, sputum conversion rates, district store inventory transaction data for drugs, sputum containers and microscope slides, supervision visit information, and lab work.
3. *Report on the Results of Treatment of Smear-Positive Pulmonary TB Patients Registered 15–18 Months Earlier*: This report provides information for analyzing treatment outcomes and measuring the treatment indicators.

The TB program reports a nearly 100 percent submission rate for the Quarterly Report on New Cases and Relapses of TB. However, only about 50 percent of districts currently submit their Quarterly Report on Programme Management. This percentage is expected to increase.

To facilitate the ordering of drugs and laboratory materials from the district level, the TB program is introducing several forms.

1. *Stock Position Form for Districts Using/Not Using TB Blister Packs*: This form provides information about stock on hand for better processing of drug orders.

2. *Drug Order Form for Districts Using/Not Using TB Blister Packs*: Districts use this form to order drugs and/or blister packs.
3. *Laboratory Reagents Order Form*: Districts use this form to order laboratory reagents.

Submission rates for the order forms are not known at this time because they were only recently introduced.

4.3. Zonal Level

Zonal level reporting consists of compiling forms sent by the districts onto one aggregated form and submitting them to the national level. Stock Position forms are not aggregated. As a result, there is a missed opportunity for program managers at all levels to use data on stock status to redistribute overstocks and supplement shortages, thereby minimizing wastage due to expiry and stockouts.

4.4. National Level

The National Level prepares two main reports currently. These are the yearly *Case-finding and Outcome of Treatment Reports*. One includes all information for the entire country and the other excludes information for Kampala. Both reports are compiled from the *Zonal Reports on New Cases and Relapses of TB and Results of Treatment of Smear-Positive Pulmonary TB Patients*.

5. Supply and Logistics

5.1. Funding Sources for Tuberculosis Drugs

Two main sources have funded TB drugs in recent years: the MOH and the GLRA. The primary source during the later 1990s was the MOH. Between 1995 and 2000, funds from the World Bank STI Project were used to supply TB drugs. GLRA also supplied TB drugs between 1995 and 2000, especially during lapses in the MOH procurement process.

More recently (2001), the TB program has been relying on a World Bank Debt Relief Facility and GLRA to supply its TB drugs. The TB program expects this to change in the near future when one year's worth of supplies ordered through the World Bank MAP Project begin to arrive (probably in July 2002).

Most recently, the TB program applied for funds through the GFATM. To date, they have not received any supplies through this funding mechanism, but they expect to receive supplies in the future.

5.2. Procurement Sources for Tuberculosis Drugs

MOH procurement depends very much on the source of funding. Under the World Bank MAP Project, the procurement unit of MAP is responsible for managing the procurement of supplies through international competitive bidding.

GLRA handles all its procurement activities. The TB program normally submits an annual estimate of need to GLRA. GLRA ensures delivery of the supplies, usually on schedule.

5.3. Quantification Method Used by Tuberculosis Program to Estimate Nationwide Tuberculosis Drug Needs

To perform its quantification of TB drugs, the MOH relies completely on service statistics data collected on cases through its routine information system (see section 4 for details). The number of pulmonary smear-positive cases (new and relapses), pulmonary smear-negative cases, and extra-pulmonary cases are added together to produce a nationwide total of cases (30,722 during the year 2001). To this value is added an additional number of cases for which no smear was taken and thus does not appear on any reporting form (estimated at 5,000 during the year 2001). Finally, the TB program estimates the number of additional cases for the upcoming year (estimated to be 7,000 or 25 percent in 2002), and adds this value to the other two values. The total value (approximately 42,000 for 2002) represents the annual number of cases expected in the coming year.

The estimation of the actual drug needs is based primarily on the total annual caseload (42,000 in 2002). In the most recent procurement, the TB program merely procured one RHEZ blister pack for each case and one HE blister pack for each case. Although retreatment cases require four more blisters of RHEZ than new cases, additional RHEZ blister packs were not procured to cover this need. The TB program explained that they had enough in stock to cover the small additional amount needed for this purpose.

It is not entirely clear how the TB program develops estimates for the additional loose drugs (RH, E, and S) needed for retreatment cases. Indications are that the TB program will estimate the number of overall cases that are retreatment cases and then procure supplies to cover the needs of these patients. For example, if 10 percent of 42,000 are determined to be retreatment cases (i.e., 4,200 cases), then 4,200 times 60 vials of S would be procured. The same procedure is used for RH and E.

A methodology similar to that used for retreatment cases is supposedly used to determine amounts to procure for children.

In all cases, the TB program is said to compare what its annual need is with what is in stock at the central level. If adequate stock is available for a commodity, then it is not procured. The TB program did not say what represented adequate stock.

Although no formal methodology exists to incorporate lead times and buffer stocks, the TB program is generally aware of its current stock level and how long it is expected to last. Based on past experience, they will usually make sure that at least one or two quarters worth of TB drugs are on hand at the central level at any time. For example, the TB program estimates that now (in April 2002), it has approximately three-quarters worth of supplies, and it expects one year's worth to arrive (under MAP funding) in July 2002. Thus, a buffer of two-quarters should be maintained throughout 2002.

When the zone receives its quarterly allocation, it will review the stock on hand at the district and the number of cases they reported to determine what portion of the quarterly shipment to allocate to each district. Districts follow the same methodology to determine what to allocate to the health units.

5.4. Quantification Method Used by Zonal/District Level to Estimate Quarterly Tuberculosis Drug Need for Districts/Health Facilities

As described in section 4, each district store submits a Drug Order form quarterly to the zonal level (on which the cases reported from all its health facilities have been aggregated), which aggregates the data for its districts and sends the aggregated form to the central level. The form received by the central level, which contains information on number of cases reported in the district last quarter and the stock position of the

district store at the end of the last quarter, is supposed to be submitted within one month of the end of each quarter. The Central Unit examines the drug orders from each zone to determine if the district stock on hand has been subtracted correctly from the amount needed by the zone when it determines the correct amount to allocate.

5.5. Storage and Distribution of Tuberculosis Drugs

There are two storage facilities used by the TB program. One is on site at the TB offices of the MOH (i.e., Wandageya Store); the other facility is in Buluba. In general, the Buluba facility is used to store stock to be distributed in what are known as GLRA zones, (the southwest, southeast, and west zones [23 districts]). The Wandageya store is used to store stock for distribution in the other zones. There are no plans to use the storage facilities of the NMS. Supplies now on order (using MAP funding) and future MOH-funded orders are scheduled to be delivered directly to the Wandageya store. GLRA-funded orders will be delivered to the Buluba site.

At the Wandageya store, stock cards are kept to record all transactions for TB drugs and materials related to the program. Stock cards are also kept at the Buluba store. The Buluba store reports its stock balances to the Wandageya store quarterly. It does not usually report its issues or other transaction information to the Wandageya store.

Storerooms are maintained at the zonal and district levels. It is reported that they also utilize stock cards to keep track of transactions and stock balances.

Transport of supplies from the central level to zonal areas is carried out by the central authorities of the TB program and it occurs quarterly. Each zonal office is responsible for distributing quarterly supplies to its respective district offices. District to health unit transport is performed in a number of ways. In some cases, the district office will assume responsibility for delivery either using its own district vehicle or via the district supervisor, who will deliver supplies during the monthly runs. In other cases, the health unit assumes responsibility and arranges for its own pickup of supplies

Quantification of Drugs for Tuberculosis Treatment

1. Background

Recently, the TB program prepared a quantification for TB blister packs and loose TB drugs to be purchased with World Bank funding under the World Bank's MAP project. The quantification was to ensure one year's supply of blister packs and loose TB drugs would be available at the end of 2002. A review of this quantification and the current stock situation of TB drugs follows.

2. Assumptions Made by Tuberculosis Unit during the Quantification Exercise

1. All districts would use blister packs of RHZE and HE to treat new and retreatment cases, and eight blisters of RHZE and 12 blisters of HE would be purchased for each new case/12 blisters of RHZE for each retreatment case.
2. Additional loose (i.e., not packaged in blisters) TB drugs of S, RH, E, and Z would be purchased, as needed, to supplement the retreatment and children's cases, using established dosages per case.
3. At least one year's supply of TB drugs should be in-country, if possible, by the end of 2002.
4. There is adequate stock on hand or in the pipeline to prevent a stockout until the end of 2002 (see table 5).
5. The MAP supplies will arrive by mid-year 2002.
6. The GLRA supply of RH tablets will arrive by mid-year 2002.
7. The expected number of adult cases of TB to be treated in 2002 is 42,000, of which 10 percent are retreatment cases.
8. An additional 4,200 children's cases of TB are to be treated in 2002.

Amounts Requested by TB Unit from MAP Project

RHZE blister packs:	42,000
HE blister packs:	42,000
Z tablets:	480,000
E tablets:	Zero
S vials:	240,000

RH tablets: Zero

Note: R: rifampicin H: isoniazid Z: pyrazinamide E: ethambutol S: streptomycin

Amounts Requested by TB Unit from GLRA Project

RH tablets: 2,000,000

Table 5: Expected Stock Status—Mid-2002

Drug	Estimated Annual Requirement	Estimated Stock on Hand (Apr 2002)	Estimated Quantity on Order	Quantity to Order
RHZE blister packs	44,100	19,186 (5 mos)	42,000 (12 mos)	0
HE blister packs	37,800	10,672 (3 mos)	42,000 (12 mos)	0
S vials	252,000	147,000 (7 mos)	240,000 (11 mos)	0
RH tablets	4,032,000	0 (0 mos)	2,000,000 (6 mos)	0
E tablets	1,890,000	3,654,000 (23 mos)	0 (0 mos)	0
Z tablets	504,000	771,000 (18 mos)	480,000 (11 mos)	0

Notes:

- TB program estimates 42,000 total annual adult cases of TB of which 90 percent are new cases (i.e., 37,800) and 10 percent are retreatment cases (i.e., 4,200).
- TB program estimates 4,200 children’s cases in addition to adult cases.
- Annual RHZE required = (One blister pack of RHZE per adult new case * 37,800 adult new cases) + (one and one-half blister packs of RHZE per adult retreatment case * 4,200 adult retreatment cases) = 44,100 RHZE blister packs.
- Annual HE required = (One blister pack of HE per adult new case * 37,800 adult new cases) = 37,800 HE blister packs.
- Annual S required = (60 vials per adult retreatment case * 4,200 adult retreatment cases) = 252,000 vials.
- Annual RH required = (600 tablets per adult retreatment case * 4,200 adult retreatment cases) + (360 tablets per child case * 4,200 child cases) = 4,032,000 tablets.
- Annual E required = (450 tablets per adult retreatment case * 4,200 adult retreatment cases) = 1,890,000 tablets.
- Annual Z required = (120 tablets per child case * 4,200 child cases) = 504,000 tablets.

Stock on hand figures based on actual February 2002 closing balance at Wandegeya and Buluba warehouses minus estimated March and April 2002 consumption. District stock on hand not included in calculation because not available.

Quantities on order based on information provided by TB program.

3. Evaluation of Quantification

- If we assume that 44,100 packs and 37,800 packs are the annual consumption rates for RHZE and HE respectively, then the average monthly consumption rates are 3,675 for RHZE (includes extra for retreatments) and 3,150 for HE. This means that, by the end of April 2002, there were five months of stock of RHZE and three months of stock of HE. Because both are required for treatment, there will be a stockout in July 2002 (about the time that the MAP shipment is expected to arrive). It is recommended that the TB program approach GLRA to supply at least six months worth of RHZE (21,000 packs) and HE blister packs (21,000 packs). These amounts are required before July 2002.
- As of April 2002, there was no stock of loose RH available to supplement retreatment and children’s cases. According to the TB program, GLRA has already been approached to supply [rifampicin/isoniazid] (RI) tablets to cover through the end of the year. It is unknown exactly how much was requested but biannual consumption is estimated to be about 2,000,000 tablets. It is recommended that the TB program remind GLRA of the urgency of delivering a supply of RH (2,000,000 tablets) as soon as possible. Supplies for 2003 should be purchased with funds from MAP or direct commodities from GDF. Funding from GFATM might also be a possibility, depending on Uganda’s future proposals and awards.

Care should be taken to avoid ordering additional amounts of ethambutol tablets. If this has already been done, the shipments should be delayed.

Recommendations

The following combination of short- and medium-term recommendations will ensure that time-sensitive actions and long-term strategic approaches with significant implications for commodity availability and logistics functions can be taken and/or begun. It is anticipated that the recommendations will be implemented by the combination of representatives from the malaria, STD/ACP, and TB program within the MOH, as well as all relevant partners working in each programmatic area.

1. General Recommendations

Recommendation 1 (mid- to long-term). Continue advocating for the urgent need to recruit a senior logistics officer to work within the expanded pharmacy department. Although the DELIVER resident advisor will continue to work with the pharmacy department team in implementing logistics system improvement activities, it is important that the team include logistics management skills to ensure capacity building within the MOH in supply chain management.

Recommendation 2 (mid-term). Explore the possibility of developing an action plan between all the units in the MOH and NMS to concretely identify the timeframe for integrating selected logistics management functions and obtain commitments to move the plan forward.

Recommendation 3 (short-term). Identify possible study tours for NMS and other appropriate commodity managers to visit neighbouring countries to benefit from lessons learned in integration, decentralization, and reform of the national medical stores.

Recommendation 4 (mid-term). Expedite the development and maintenance of a central commodity database to track all MOH and donor inputs for essential health commodity supplies. This information has been, and is likely to continue to be, crucial in alerting commodity management donors and stakeholders about impending stockouts or shortages in various product categories.

2. Tuberculosis Program

Quantification

Recommendation 5 (short- to mid-term). Work with the TB program to explain the benefits of using actual issues and stock on hand figures from the Wandageya and Buluba stores to estimate future need, beginning at the end of 2002 (when the blister packs should be used universally).

Recommendation 6 (short- to mid-term). Regardless of whether or not the TB program eventually adopts a consumption-based quantification model, they should consider establishing a six-month buffer for all commodities and procure enough to maintain this buffer.

Recommendation 7 (short- to mid-term). Because the DOTS program expects to result in a 25 percent increase of coverage of cases in 2003, the next quantification should incorporate an expected 25 percent increase in consumption. This quantification should be undertaken soon.

Procurement and Financing

Recommendation 8 (short- to mid-term). Approach GLRA to supply at least six months of RHZE (21,000 packs) and HE blister packs (21,000 packs). These amounts are required before July 2002.

Recommendation 9 (short- to mid-term). Remind GLRA of the urgency of delivering two million tablets of RH, as soon as possible.

Recommendation 10 (short- to mid-term). Care should be taken to not order additional amounts of ethambutol tablets. If this has been done, delay the shipments.

Recommendation 11 (short- to mid-term). Begin to identify possible funding sources for 2003, and approach each source in mid-2002 after the next quantification exercise is complete. To avoid delays in receiving the items, ensure that suppliers have products registered in the country or start the process immediately.

Distribution and Storage

Recommendation 12 (mid-term). Begin to use the consumption and stock balance information on the *program management* form to improve distribution. For example, aggregated stock position data (see 4.2) would allow central level managers to redistribute overstocks and supplement shortages to avoid wastage due to expiries and stockouts.

Recommendation 13 (short- to mid-term). Because of the complexities involved with integration, it is not advisable, at this time, to integrate the TB distribution system with essential drugs.

Information Systems

Recommendation 14 (short- to mid-term). Improve the reporting of consumption and stock data from lower level facilities using the new *program management* reporting form.

Appendix A
People Contacted

People Contacted

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