PAPER HEALTH REGISTERS PROJECT CASE STUDY:

UGANDA'S NATIONAL TUBERCULOSIS PROGRAM REGISTER

UNIVERSITY OF WASHINGTON GLOBAL HEALTH START PROGRAM
REPORT TO THE BILL AND MELINDA GATES FOUNDATION

JUNE 2014

PRODUCED BY: GREENE S, WESTLEY E, TARR G, HAWES S

EXECUTIVE SUMMARY

Uganda is ranked 20th in Tuberculosis (TB) incidence among 22 high-TB burden countries with an estimated 179 cases per 100,000 population in 2012. High HIV prevalence remains a catalyst for sustained TB incidence. To address the challenges of TB and HIV co-endemicity, the World Health Organization (WHO) developed comprehensive recommendations to strengthen linkages between TB- and HIV-control programs called TB/HIV collaborative activities in 2004. Uganda has subsequently made great strides to integrate TB and HIV services to improve TB control.

In 2005, Uganda's National Tuberculosis and Leprosy Program (NTLP) developed data collection and reporting instruments that were aligned with WHO Stop TB's recommendations and adapted to meet specific country needs. The NTLP orchestrates a system of five separate patient registers designed to track patients through the health system, report laboratory results, and record treatment outcomes. The individual registers are reconciled in a single register designed to capture minimum key data elements necessary for 22 standardized program indicators.

Since implementation of the registers, Uganda has made steady progress to improve data collection and accuracy. The initial implementation of the registers did not include training on TB/HIV collaborative activities or how to properly fill out the registers. Following implementation, both internal and external data audits identified gaps in data quality and a lack of evidence-based decision-making. Structural program interventions, including supportive supervision and allocating dedicated staff time to quality assurance in TB health facilities, have been instrumental in improving TB/HIV collaborative activities. Lessons learned include: (1) registers can be adapted to meet changing health needs and (2) supportive supervision and institutionalized quality assurance measures can improve data quality. These efforts provide on-the-job training, which strengthens health facility workers' capacity to improve data collection and make decisions about patient care using the registers.

COUNTRY PROFILE: UGANDA

Population (2011): 33,987,000

GNI (PPP int. $) (2011): $1,310

Life Expectancy at birth (2011): (M/F) 57/54

Fertility Rate: 6.06

Deaths due to TB among HIV negative persons per 100,000 (2012): 13 [2.3-33]

Incidence of TB per 100,000 (2012): 179 [145-216]

Prevalence of TB per 100,000 (2012): 174 [67-334]

(WHO 2013)

PURPOSE

This report summarizes work conducted by the University of Washington's Global Health Strategic Analysis, Research and Training Program (START) team in response to the Bill and Melinda Gates Foundation's (the Foundation) work order *Paper Health Registers Project*. Even as many health information systems worldwide move toward electronic and mobile models, paper health registers continue to be relevant tools in many low-resource settings. Case studies were identified to fill gaps in knowledge about best practices for implementation and use of paper health registers. Innovative register systems in Ethiopia, Ghana, South Africa, Uganda, and Uruguay illuminate opportunities for improving paper health register systems and identify approaches to both strengthen support for patient care and optimize reporting mechanisms. This case study of Uganda's National Tuberculosis Program Register is one of five case studies developed in response to the work order.

TABLE OF CONTENTS

Executive summary 2
Purpose 3
Background 5
The global tuberculosis epidemic 5
Uganda 7
The National Tuberculosis Register 9
Developing the system 11
Motivating change 11
Building support 11
Designing the update 11
Disseminating the update 13
Assessing the progress of register implementation 14
Maintaining the updates 14
Identifying way to improve the system 15
Ongoing monitoring and evaluation of the register system 16
Sustaining support from key stakeholders 17
References 20
Appendix A:Uganda's National Tuberculosis Program Registers 23

BACKGROUND

THE GLOBAL TUBERCULOSIS EPIDEMIC

Tuberculosis (TB) is a major global health challenge. It is an infectious disease that typically affects the lungs, but can spread to other parts of the body. It is estimated that one-third of the global population is infected with TB, but only 5-10% of people progress from latent infection to active TB disease. Immuno-compromised individuals, including people living with HIV, have 12-20 times the risk of developing active TB (LoBue 2014). Globally, an estimated 13% of people with active TB are co-infected with HIV (WHO 2013b).

Beginning in the 1990s, the HIV epidemic led to a surge in TB incidence and mortality particularly in sub-Saharan Africa. People living with HIV who have a latent TB infection are more likely to develop TB disease than those who are HIV-negative. Most individuals remain healthy after exposure to TB because there is an innate immune response in the lungs that limits the spread of TB and disease progression. However, a disruption of the immune response to TB occurs when an individual seroconverts to HIV-positive status. When HIV replication begins the HIV-mediated response results in a rapid depletion of CD4+ T-cells, the cells that activate the immune system. This deleterious effect on the immune system subsequently results in activation of TB infection (Diedrich et al. 2011). In addition, many of the social determinants of disease that are associated with TB, including socio-economic disparities and mobile populations, are also associated with HIV resulting in a co-epidemic of the two diseases (Hargreaves et al. 2011). Structural interventions that address both diseases have been at the forefront of the international effort to reduce the global burden of TB.

Due to the complex interactions between TB and HIV, it is essential to screen all HIV-positive patients for TB. The long-term life expectancy of HIV-positive patients is dependent on the recovery of CD4+ T-cells. Early diagnosis of TB infection and the proper treatment regimen prevents activation of TB and is therefore critical to improved long-term clinical outcomes. WHO 2006 clinical guidelines recommend that routine co-trimoxazole preventative therapy (CPT) is administered to all HIV-positive patients with active TB (WHO 2006). CPT is a broad-spectrum antibiotic and anti-parasitic agent. Administration is effective in preventing opportunistic infection and can be administered simultaneously with highly active antiretroviral therapy (HAART). HIV-positive patients with active TB are administered a daily treatment cocktail for TB containing isoniazid, rifampicin, pyrazinamide, and ethambutol for two months, followed by four months of isoniazid and rifampicin. HAART should be initiated within eight weeks of TB treatment initiation regardless of CD4+ count. For patients with signs of only latent TB, isoniazid should be administered for up to 36 months to prevent activation of the infection (WHO 2009).

THE STOP TB STRATEGY

The WHO coordinates global TB activities, including the development of new tools, prevention strategies, and treatment guidelines. The Stop TB Partnership operates as an independent coordinating body within the WHO with a mission to guide the strategic direction of the global fight against TB. The program aims to advance TB care through a comprehensive set of technical guidelines focused on prevention, treatment, and response. This global leadership provides technical and financial support to national programs to implement TB control strategies, monitor progress, and translate research into practice.

The Stop TB Strategy adopted the WHO's comprehensive recommendations to strengthen linkages between TB- and HIV-control programs called TB/HIV collaborative activities. The underlying premise is that routine HIV testing and counseling should be offered to all individuals with suspected or confirmed cases of TB as well as their sexual partners and family to reduce the burden of HIV. All HIV-positive patients should be tested for TB and should be started on CPT-therapy immediately if TB is confirmed (WHO 2004). In 2006, the Stop TB Partnership promoted a six-point strategy to address the key challenges facing high-risk populations and to reduce TB burden. The core components include: 1) pursue high-quality directly observed treatment, short course (DOTS); 2) address TB/HIV, multidrug-resistant TB (MDR-TB), and the needs of poor and vulnerable populations; 3) contribute to health systems strengthening; 4) engage all care providers; 5) empower people and communities with TB; and, 6) enable and promote research. This expanded strategy is key to successful treatment outcomes.

These core components also align with Millennium Development Goal 6 (MDG6), to halt and begin to reduce the burden of TB by 2015. This goal calls for a 50% decline in the number of incident TB cases from 1990s levels, as well as improving both the case detection rate to 70% and treatment success rate to 85% by 2015.

DATA FOR TUBERCULOSIS PROGRAMS

Data collection and reporting are essential to control TB worldwide. In 2005, the Stop TB Partnership led an iterative strategy to develop recommendations for TB forms and registers that involved field-testing and surveys in 105 countries. Field-testing resulted in consensus on the minimum data requirements to ensure all components of the Stop TB Strategy were implemented. These recommendations were released in 2005. The revised forms included updates for data capture on TB/HIV activities, diagnostics, and TB resistance testing. Furthermore, Stop TB developed a standard training protocol and provided funding to countries for implementation. By using standardized registers, Stop TB has an improved platform for responding to changes in epidemiological trends, informing the development of new strategies, and setting policy guidelines in order to effectively control TB (Norval et al. 2008).

To effectively monitor the standardized registers that were implemented, Stop TB worked with international partners to agree upon a core set of indicators to minimize reporting burden (Gunneberg et al. 2008). Guidelines for monitoring and evaluating collaborative TB/HIV activities were initially released in 2004, with an updated revision in 2009 (WHO 2009). The guidelines state: "Internationally agreed and harmonized M&E indicators emphasize to those responsible for making and implementing policy the importance of specific activities and may help to ensure that these activities occur in line with the dictum 'what gets measured gets done'," (WHO 2009). These guidelines note that both TB and HIV programs generally rely on a patient health card and use a register to draw information from these records for reporting purposes. The report highlights that HIV registers should include some TB indicators, and TB registers should include some HIV indicators. Though these indicators are routinely summarized for their respective health programs, the guidelines do not elaborate on how to reduce these duplicative efforts.

In the revised version of the guidelines, Stop TB describes the potential role of "supportive supervision" in collaborative TB/HIV activities. Supportive supervision is a type of data management supervision that aims to bolster a culture of data by "identifying and discussing difficulties or misunderstandings in data management and providing opportunities for learning," in a routine, semi-structured manner (WHO 2009). This can include quality checks of reporting and recording, inspection of records and registers, or larger data quality assessments.

UGANDA

Uganda is an East African country that shares borders with three other high-TB burden countries, Kenya, Tanzania, and Democratic Republic of the Congo. Uganda has a population of 34 million and a per capita gross national income of $1,310 USD adjusted for purchasing power parity (WHO 2013a). Approximately 25% of the population lives below the poverty level. The UN Development Index ranks Uganda as 161 out of 187 countries, with a low Human Development score of 0.456. This index reflects the amount of schooling, life expectancy, and income level (UNDP 2014).

UGANDA'S HEALTH SYSTEM

Health sector reform was initiated in Uganda in 1993 as a part of a larger reform to the public sector to decentralize, liberalize, and privatize. This restructure aimed to increase community access to health care (Jeppsson et al. 2000). The Ministry of Health (MoH) was designated as the lead institution to formulate policy, provide training, establish guidelines, and transition government entities away from providing care directly. Uganda is divided into nine operational zones, which are further divided into districts, sub-districts, and sub-counties. The sub-county was established as the administrative level to directly provide care at the local level.

The government of Uganda implemented the first National Health Policy in 1999 and developed the first phase of a Health Sector Strategic & Investment Plan (HSSIP) with funding from the World Bank. The HSSIP was designed to provide a strategic framework to guide all health program interventions, planning, and implementation. This plan also provides the standards for health facilities, linkages between levels of care, and reporting mechanisms. The structure of the health system closely follows the administrative boundaries for Uganda (Table 1).

Table 1: Structure of the National Health System and TB Service Delivery Points in Uganda

Facility Unit	TB Services	Location	Population served
Health Center I	DOTS	Village	1,000
Health Center II	First level of formal health system	Parish	5,000
Health Center III	Sputum testing	Sub-county	20,000
Health Center IV	Sputum testing and TB treatment	Sub-district	100,000
General Hospital	TB diagnostics including X-ray, sputum testing, culture; TB treatment	District	100,000-1 million
National Referral Hospital	MDR-TB testing	National	Nationwide

Uganda completed a follow-up HSSIP in 2005. TB program interventions included implementing Stop TB's strategy of expanded DOTS to all districts as a means of improving global case detection and increasing treatment success (MOH 2010; MOH 2005). The 2005 HSSIP recognized that an expanded DOTS strategy could be successful. Other core interventions planned for TB included facilitating linkages between TB and HIV services.

TUBERCULOSIS BURDEN IN UGANDA

Uganda has an estimated 179 TB cases per 100,000 population in 2012, and was ranked 20th among 22 high-TB burden countries (WHO 2013b). TB incidence has steadily declined during the past two decades from a high of 624 cases per 100,000 in 1990. Men experience a higher burden of TB than women, with a ratio of 1.8 males for every 1 female case reported. Most newly detected cases (98.5%) are among adults older than 15 years (WHO 2013b).

Case detection has steadily improved from 13% in 1990 to 69% in 2011 (WHO 2013b). For undetected cases of TB, there is a delay in diagnosis and treatment initiation, as well as poorer patient outcomes (WHO 2009). Improving case detection is a hallmark of the Stop TB Strategy and aligns with the MDGs. Uganda's TB program must sustain and improve case detection rates to achieve the MDG of 70% case detection rate by 2015. Treatment success rates have shown some improvement over time. This may be a result of improved case detection among HIV-positive individuals as this subgroup typically has poorer treatment outcomes. Uganda implemented the expanded and enhanced DOTS intervention to all districts by 2010, but there is still potential for improvement of intensified TB case finding and infection control (WHO 2013b; MOH 2011). The treatment success rate for new smear positive cases was 77% in 2011. This falls short of the MDG for 2015 of 85% treatment success (WHO 2013b).

TB-HIV CO-ENDEMICITY IN UGANDA

The high prevalence of HIV is the driving force fueling the TB epidemic in Uganda and about half of new TB cases identified each year are in HIV-positive individuals. UNAIDS estimated that in 2012, 1.5 million people living in Uganda are HIV-positive, a prevalence of 7.2%. The urban/rural divide in HIV prevalence is similar to the TB trend, with major urban areas having higher prevalence of cases than rural regions. The burden of HIV is higher among women; 7.7% of women are HIV-positive compared to 6.7% of men, and women account for 56% of HIV-positive, TB cases (Uganda AIDS Commission 2012).

Uganda's MoH implemented a comprehensive TB/HIV collaborative intervention package in 2005. Uganda reported 54.3% of eligible adults and children were receiving HAART. This prompted the MoH to update eligibility and expand coverage of HAART, allowing adults to initiate treatment earlier and making all TB patients eligible for immediate initiation. As a result, by 2012 the proportion of HIV-positive population on HAART increased to 62% (UNDP 2013). Of HIV-positive patients, 81.7% were screened for TB in 2010 (Uganda AIDS Commission, 2012). The proportion of HIV-positive TB patients on CPT increased from 70.9% in 2008 to 94% in 2012. Although this is still short of the Stop TB target of 100%, this marks steady progress toward reaching the target (Uganda AIDS Commission 2012; WHO 2013b).

THE NATIONAL TUBERCULOSIS AND LEPROSY PROGRAM

Efforts to control TB in Uganda date back to 1965. Tuberculosis and Leprosy program activities were combined in 1990 to establish the National Tuberculosis and Leprosy Program (NTLP). Many countries reported on surveillance activities for mycobacterial diseases, represented by both TB and Leprosy. Additionally, treatment strategies and regimens, including DOTS, are similar for the two diseases. (Raviglione et al. 2002). For this reason, many of the surveillance activities are integrated and are administered by the NTLP, a branch of the National Disease Control department of the MoH. Both programs have separate paper health registers and reporting mechanisms. This case study focuses only on TB registers and reporting activities.

The NTLP operates in all health districts. Operational zones are headed by Zonal TB Supervisors. At the district level, the NTLP has a District Health Officer (DHO), District TB Supervisor (DTS), and the District Laboratory Focal Person (DLFP). The county and sub-county levels both have focal persons in charge of quality assurance. These administrative levels also have a supervisor for health facility workers and Sub-County Health Workers (SCHW) charged with administering DOTS (HSSIP 2010; MOH 2010). The NTLP has developed a comprehensive set of guidelines that are aligned with the Stop TB strategy and oriented to meet MDG 6 (UNDP 2013).

The size of Uganda's TB budget was $31 million USD in 2013. International donors funded 62% of the TB budget. Only 7% was funded domestically, with the remainder of the budget unfunded (WHO 2013b). The Uganda MoH has cited difficulties in coordinating donor funds, which are mostly directed to HIV/AIDS, TB, and malaria (HSSIP 2010). Most of these resources come from either Stop TB program funds or USAID's cooperative agreement called Strengthening TB and HIV & AIDS Response, which is led by a consortium of partners including FHI360, John Snow Institute (JSI), Elizabeth Glaser Pediatric AIDS Foundation, International Union Against Tuberculosis and Lung Disease (UNION), and Management Health Sciences, among others. Each implementing partner works to strengthen capacity and manage resources within the guidelines put forth by the NTLP in each specific geographic region.

NTLP'S PAPER REGISTER SYSTEM

In order to measure progress toward Stop TB targets and MDGs, the NTLP utilizes a comprehensive system of 17 separate tracking and reporting mechanisms including five registers, four patient form, four reporting forms, two laboratory requests, one pharmacy log, and one stock inventory sheet. The purpose of multiple forms and registers is to track suspected cases, laboratory testing, drug delivery, treatment adherence, and cure rates. The responsibility for filling out the patient registers is spread across different health workers, which limits the individual burden and person-time spent on any single register or form (Mupere 2014). Because information is tracked in five registers, there are many duplicate fields. This poses a problem of inconsistent data capture when data is entered in many disparate sources and locations. Table 2 provides details on the specific registers used by the NTLP, those responsible for the data input, and the basic protocol for completing the register and Figure 2 is the sequence of events (MOH 2010).

In 2012, WHO released guidelines on how to select, implement, and maintain electronic recording and reporting systems for TB control. In order to transition from paper to electronic, WHO recommends that there is a strong foundation of quality data collection and reporting before transitioning to a new

electronic system (WHO 2012). Currently, the NTLP does not have plans for transitioning from a paper to electronic register system. The NTLP continues to collect all information on paper, because there are challenges with maintenance and stewardship of electronic technologies. The technology can be very expensive to maintain and there is not always the expertise for computer maintenance, particularly in remote areas. If there is a breakdown in the electronic system, there is no backup to routinely collect information in the register. Additionally, many health workers want to maintain the equipment for use in the future, and thus avoid using the technology all together. According to Dr. Eric Wobudeya, a pediatric TB clinician at the National Referral TB Hospital in Kampala, paper registers continue to be the best option for the NTLP to maintain a nationally representative TB reporting system based on patient records and registers (Wobudeya 2014).

Table 2: Operational Guidelines for the Five Patient Registers Used by Uganda's National Tuberculosis and Leprosy Program (MOH 2010)

Register Name	Responsibility	Protocol
Suspect Register	Health Facility Worker	All suspected TB patients are entered in the suspect register and given a unique suspect ID number. This information is used to generate the Request for Sputum Examination Card, which is sent to the laboratory with sputum sample.
Laboratory Register	Microbiologist	The lab transfers the information from the Request for Sputum Examination to the Laboratory Register to maintain a record of tests conducted and test results generated. The lab completes the Request for Sputum Examination Card with testing results and returns the information to the health facility. The laboratory also sends lab specimens to the National Reference Laboratory for all relapse cases of TB.
Sub-county Health Worker Register (SCHW)	Sub-county Health Worker	All patients treated at the household level with DOTS are entered in the SCHW Register to track drug delivery and patient adherence.
Unit TB Register	Health Facility Worker	A positive result from the laboratory requires the health facility worker to generate a TB Treatment Card and input the patient information in the Unit TB Register. For TB cases treated at home, information is abstracted from the SCHW Register to update the Unit TB Register.
District TB Register	District TB Supervisor	Information from the TB Treatment Card and the Unit TB Register is abstracted to update the District Register.

Typically, the data flows from the patient record to the Unit TB Register. This information is abstracted by the District TB Supervisor and re-entered into the District TB register. At the district level, this data is then aggregated and reported quarterly to the NTLP central unit where it is input into an Excel database (MOH 2010).

The NTLP has been collecting, collating, and analyzing data for evidenced-based decision making for over two decades. The system is currently in the maintenance stage. Periodically, changes occur in response to international standards or national health trends, such as co-infection with HIV or MDR-TB. The challenge for the NTLP is to maintain the current standards of data collection and reporting while planning, piloting, and implementing additional layers of data collection and standardized indicators. This case study focuses on updating the NTLP's system of paper registers to integrate collaborative activities between TB and HIV vertical health programs.

DEVELOPING NTLP'S SYSTEM FOR MONITORING TB/HIV COLLABORATIVE ACTIVITIES

MOTIVATING CHANGE

In response to the dual burden of TB and HIV, WHO established pilot sites to explore ways in which existing HIV voluntary testing and counseling centers could also be an entry point to provide TB prevention and treatment (Godfrey-Faussett et al. 2002). Initial pilot sites were established in Malawi, Zambia, and South Africa in 1997. An additional pilot site was established in Uganda in 2001. From January to October 2001, the NTLP collaborated with Uganda's AIDS Control Program and the Centers for Disease Control and Prevention-Uganda to pilot a TB program at the AIDS Information Center (AIC) in Kampala. The pilot study highlighted the challenge of tracking individuals through the system. Of the 3,262 individuals screened, 859 (26%) were lost to follow-up after the initial screening and 1,132 (35%) were either ineligible for or declined isoniazid preventative therapy.

The pilot study resulted in recommendations to strengthen the referral system, standardize follow-up procedures with clients, and improve tracking mechanisms of suspected TB cases through an improved register system. The pilot also highlighted poor recording mechanisms as a weak component of the system. The strategic framework for TB/HIV collaborative activities included recommendations for developing forms and registers to monitor program activities (van Gorkom et al. 2002). Using evaluations from pilot sites, the WHO began advocating for policies to integrate TB and HIV activities at the national level. Interim guidelines for integration were first published in 2004, and recommendations have evolved as additional evidence has emerged from randomized trials, further operational research, and lessons learned from national TB programs (WHO 2004).

BUILDING SUPPORT

In response to the WHO recommendations for TB/HIV collaborative activities, Uganda's MoH assembled stakeholders from the Ministries of Health, Defense, and Labor, and district-level officials in 2005 to organize the response to TB and HIV through participation in a National Coordinating Committee (NCC) (MOH 2006). The NCC developed guidelines to standardize HIV/TB practices in Uganda, with the rationale that "HIV prevention and care should be a priority concern of TB programs, and TB care and prevention should be a priority concern of national HIV/AIDS control programs" (MOH 2006). The NTLP adopted the recommendations and initiated surveillance of HIV status among TB patients. The NCC guidelines further recommended that each district should develop implementation plans for joint TB and HIV activities by the end of 2006.

DESIGNING THE UPDATE

To really address the co-morbidity of TB and HIV, the NTLP had to improve case-detection rates, enhance laboratory surveillance, and create a mechanism of communication between two vertical health systems. The NCC's recommendations included suggestions for modifying registers and reporting forms and identified 10 core indicators on TB/HIV collaborative activities. Implementing these changes were complicated by the fact that the NTLP is responsible for reporting indicators collected at TB clinics, and the National AIDS Control Program is responsible for reporting indicators collected at HIV care centers. Thus, the TB registers needed to add several columns to capture information on HIV testing, CPT initiation, and HAART treatment. The system of registers also needed to add a mechanism for sharing data between TB and HIV clinics (MOH 2006; Okot-Chono et al. 2009).

The patient registers were modeled after registers and forms developed by the Stop TB program (Norval et al. 2008). WHO provided both the format of the paper register and encouraged each country to modify the forms and registers. By providing draft forms, Stop TB helped national TB programs to capture only the data necessary for program indicators (Laserson et al. 2006). The patient forms and registers developed by the NCC were similar to the WHO recommendations (MOH 2010) with some modifications (discussed below). The forms and registers developed in 2005 are still in use in 2014.

There are two main differences between the WHO draft forms and Uganda's versions. The NCC modified instructions at the bottom of the Unit and District TB registers to guide the health facility worker on how to properly record the data. Additionally, the Unit TB Register captures whether a patient was transferred and the reason why the patient was transferred. The register captures this information because health facilities that offer HIV testing do not always offer TB care and laboratory services, necessitating frequent transfers.

Physical separation of HIV and TB health facilities also required Uganda to create linkages between HIV and TB care settings. This is done using a TB Suspect Register in the HIV care setting. When an individual tests positive for HIV, the health facility worker fills out the Active Case Finding Form. Printed directly on the form is a series of five questions that are administered to the patient and depending on the answers, an algorithm is followed to determine TB status. The algorithm uses simple language and is printed directly on the form. This also serves as an effective job aid tool by guiding the health worker toward an evidenced-based decision. If TB is suspected, the health facility worker fills out the TB/HIV Referral Form and CPT treatment is initiated immediately. This form is also used for TB patients to be tested for HIV status. The patient receives half of the form to take to either the TB or HIV health facility and the other half is submitted to the transferring facility to track patients who may delay TB or HIV testing. Once the case finding form is complete, the HIV-positive patient is entered in the TB Suspect Register. It is then the TB focal person's responsibility to check that all patients entered in the Unit TB Register are also entered in the TB Suspect and Laboratory Registers, in order to track referrals.

TB patients may have different entry points into the system, either at an HIV testing facility, a TB clinic, or a referral from the sub-county health worker in the community. However, the registers are designed to reconcile the data that is collected at these points of entry with the data that is required for the Unit TB Register at the TB clinic. This register should be the most complete data source. The DTS abstracts information in the TB Unit Register quarterly to submit an indicator report to NTLP (Figure 1). Overall, the NTLP monitors 22 indicators, including the four designed by the NCC for TB/HIV activities (MOH 2006).

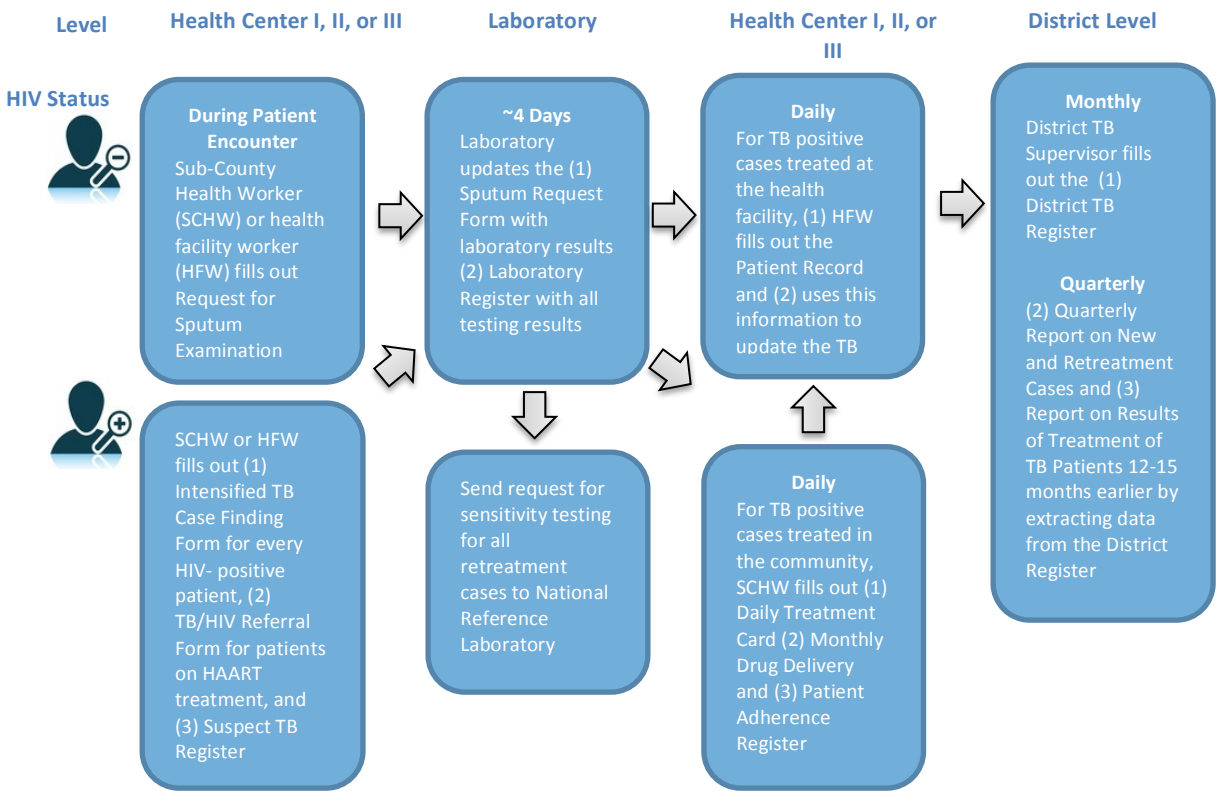

Figure 1 NTLP Data Flow. The flow of information by the entry point into the TB system and the level of care, NTLP 2010.

DISSEMINATING THE UPDATE

The NCC committee approved the HIV/TB collaborative guidelines in 2005 and set a target date of mid-2006 for all districts to have implemented a mechanism for TB and HIV integration (Okot-Chono et al. 2009). However, there was no standardized implementation plan or training curriculum designed for TB/HIV activities before the official rollout began. The NCC advised each district to develop separate implementation plans.

The registers were distributed to all facilities through the standard supply chain system. NTLP program materials and TB medications are distributed to each facility through stock requisition reports. All health facilities must submit program reports to the district every other month. These reports include standard program indicators and stock requests. The program operates on a “no report, no product” basis. This policy provides both accountability and incentives for health facilities to record and report the data out to the district level in a timely manner. The amended TB registers were provided through this routine supply chain, so as TB clinics submitted reports and requested new program supplies, the new registers were delivered to each facility (Okoboi 2014).

At the time, it was the responsibility of the manager of each TB facility to review the instructions in the front of each register and provide training to relevant staff. While there are routine trainings for NTLP

program staff, it was not until 2012 that the NTLP organized a regional training program that focused on the register requirements and improving data quality (Okoboi 2014).

ASSESSING PROGRESS OF THE REGISTER IMPLEMENTATION

The amended registers were in all TB clinics as of 2005. However, without a training curriculum or standardized way to inform all TB personnel of the changes, the rollout of TB-HIV collaborative activities was not consistent. The lack of planning delayed implementation of the guidelines and the new registers were not fully utilized to improve patient outcomes. Shortly after TB/HIV collaborative activities were initiated in all districts, operational research was conducted by the UNION, NTLP, and the AIDS Control Program to evaluate the implementation process. From August to December 2006, 260 interviews of patients and TB health facility staff in five districts were conducted, and the new registers were reviewed for completeness. The results from this evaluation highlighted several gaps and barriers to integrating TB/HIV collaborative services. First, while the NCC had advised each district to develop implementation plans, there was no additional funding provided for the development of training curriculum and supervision of the updated registers (Okot-Chono et al. 2009). Moreover, although the NCC distributed the new TB/HIV collaborative policy and guidelines to each district, these guidelines were not disseminated to the health facility level. Some health facility personnel were trained, but not in a systematic manner, and there were no guidelines in place to provide follow-up training. Lastly, while every health facility visited had an updated TB Unit Register, the data in registers was incomplete. Health facility staff did not know how to use the information captured in the register to inform patient care, such as making referrals for HIV care (Okot-Chono et al. 2009).

Following the evaluation of the initial implementation, the Uganda National Policy on TB/HIV Collaborative Activities provided guidelines that supervisors at the regional, district, and health facility levels were responsible for appointing a focal person for TB/HIV. This was a new position created both to ensure implementation of collaborative activities and monitor program progress using data.

MAINTAINING THE UPDATES

Although inadequate planning caused inconsistent implementation of TB/HIV collaborative activities, TB/HIV collaborative services have improved since 2005. At the outset of the program, only 25% of TB patients had known HIV status. By 2012, this proportion had climbed to 86%. The register is currently in its maintenance stage. Its ongoing use and success has been characterized by continuous stakeholder engagement and ongoing efforts to identify gaps, improve data collection, and impact patient outcomes. Figure 2 shows the important implementation events of TB/HIV activities and the sequence of interventions that have contributed to enhancing the register. All districts are now reporting TB/HIV collaborative activities using the updated register, and a focal person has been identified in all TB clinics (Mupere 2014b).

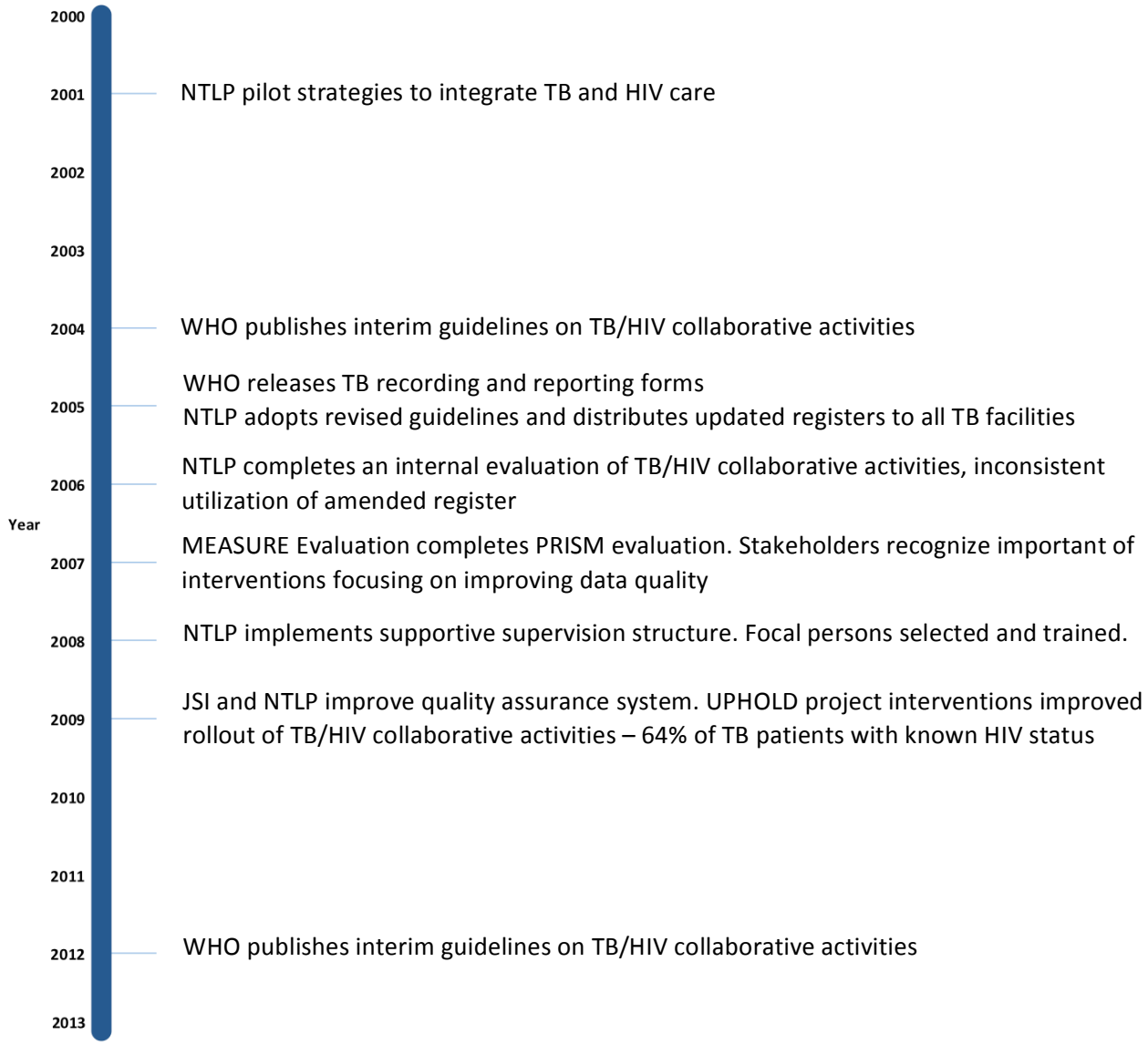

Figure 2. Uganda's National Tuberculosis and Leprosy Program timeline of events for implementing TB/HIV collaborative activities

IDENTIFYING WAYS TO IMPROVE THE SYSTEM

The NTLP collaborated with implementing partners to use ongoing monitoring and evaluation (M&E) activities to identify gaps in the TB program. Interventions, including supportive supervision and quality assurance, are strategies implemented to improve data collection and data use. The NTLP has made strides in generating a culture of data at all levels of the program. In each district health facility, the District Health Officer is tasked with reviewing reports for accuracy and ensuring that registers and record cards are acquisitioned from the TB Central Unit. At the sub-district level, a TB focal person is responsible for maintaining current and properly filled registers. Finally, at the health facility level, day-

to-day responsibilities by all health facility workers include properly filling out the TB Unit Register (Wobudeya 2014b).

As the NTLP began monitoring TB/HIV collaborative activities, gaps were identified in the quality of reporting, highlighting the need to improve quality assurance. The Performance of Routine Information System Management (PRISM) framework, which assesses the overall utility and reliability of health data, was applied to overall health data systems in Uganda in 2004 and 2007. This external assessment evaluated the delivery of quality health care services by focusing on the determinants of data collection, transmission, processing, and use for evidence-based decision-making. Surveys on the user-friendliness of data collection registers, the availability of registers at the facility level, quality of supervision, and a behavioral assessment of health workers on perceptions of data collection were administered in more than 100 district health facilities in each of the two years. The investigators generated indices on data quality and use of information.

Results of the assessment were revealing. Most health facility workers had the perception that data was important; 74% believed that the MoH promoted data quality and 72% responded that information is used for patient care (Aquil et al. 2009; Aquil 2008). Data completeness was low; 100% of reports had at least one missing section. Of the data that was collected, the level of accuracy was 79%. However, if all of the data that was missing was also considered to be inaccurate, then the level of accuracy dropped to 42% (Aquil et al. 2009; Hotchkiss et al. 2010; Aquil 2008). Finally, the timeliness of facility-based reporting also varied. At the district level, timeliness ranged from 5% of facilities in the district reporting on time to 91% of facilities reporting on time. Most indicators did not change between 2004 and 2007, including the use of health data. Recordkeeping improved in 2007, but the overall accuracy of data collected was not significantly different than the results from the 2004 survey (Hotchkiss et al. 2010). This survey highlighted a disconnect between how health workers in Uganda perceived data collection and information use, and their observed performance. This resulted in a discussion between the MoH and over 50 stakeholders on how to develop interventions to build a culture of information, implement supportive supervision, and strengthen competence in using information collected in the registers (USAID 2008). While this assessment was conducted on all health information systems in Uganda, there was recognition of the importance of data quality in the TB control program.

ONGOING MONITORING AND EVALUATION OF THE REGISTER SYSTEM

These survey results and other external surveys highlighted a challenge within the Ugandan health system to motivate health workers to systematically and accurately capture data. In order to explore ways to improve TB reporting, the NTLP partnered with the JSI in 2007 with funding from USAID to implement training and technical assistance. The first project, called Uganda Program for Human and Holistic Development (UPHOLD), aimed to improve quality assurance systems through a system of performance standards. Activities included training on TB registers, development of TB/HIV health worker guides to facilitate integration of activities, and how to properly manage the data. In addition, the district TB focal persons were provided additional training on supportive supervision. Prior to NTLP's implementation of TB/HIV collaborative activities in 2005, HIV-positive patients were not routinely screened for TB. By the end of 2008, intervention health facilities recorded that 64% of TB patients received HIV testing and counseling (USAID 2008). While this shows that there is considerable room for improvement, the system of checks and balances utilizing both supportive supervision and designating responsibility of reviewing TB registers to the focal person was improving TB indicators, especially case detection. This layer of quality assurance was highlighted in a personal interview with Dr. Ezekiel

Mupere, a pediatric surgeon, as the key strength of the NTLP TB control program (Mujasi et al. 2009; Mupere 2014; MOH 2010).

To underscore the importance of these workforce support interventions, the MoH operationalized supportive supervision guidelines in 2010. Furthermore, the 22 program indicators include a program specific indicator that tracks the proportion of planned supervisory visits actually conducted each quarter. Each quarter, District and Zonal TB officers submit a report which tracks the number of TB facilities and the number of days spent conducting supervision. Supervisors also submit a quarterly work plan with a schedule of supervisory visits; this provides the denominator data. The limitation of this indicator is that it only assesses frequency, not quality of supervisory visits.

Still, the NTLP guidelines have shifted away from a checklist of facility resources to instead focus on enhancing the performance of the register users. Guidelines recommend that following a review of the health facility, the DTS should sit down with the health facility staff to assess the results and create corrective action plans. A written report of the findings and action plans are given to the focal person at the clinic and also submitted to the district (MOH 2010). Without the input of the health facility staff, a supervisory visit is another program requirement. Using information (or lack thereof) in the registers, TB supervisors can both identify challenges at the facility and work with health facility staff to understand how to use the data. The impact of these data improvement interventions is dependent on the TB clinic staff, the supervisors, and the resources to support these activities. In TB facilities where these resources are adequate, high quality, supportive supervision is key to understanding data and provides an opportunity for mentoring health facility staff on the job (Mupere 2014).

Currently, the NTLP monitors case detection, treatment outcomes, success of TB/HIV collaborative activities, and laboratory testing through systematic collection of reports and analysis of trends. There has been a push by the NTLP to simplify the language used in the registers, reports, and manuals (Wobudeya 2014). The result breaks down each indicator into component elements and details how to abstract the correct data from the register and use this data to report properly. This helps to avoid confusion in preparing reports and provides a consistent source for the data. Importantly, the NTLP tracks both the completeness and accuracy of the data entered in the TB Unit Registers, which are captured by two separate indicators.

SUSTAINING SUPPORT FROM KEY STAKEHOLDERS

The NTLP relies heavily on external funding to sustain program activities. In 2013, there were large increases in the amount of international and domestic funds dedicated to TB (MOH 2010). Implementing partners and the NTLP have sustained funding commitments from USAID, the Global Fund to Fight AIDS, Tuberculosis, and Malaria, and Stop TB. External partners will continue to be important assets to the maintenance of Uganda's TB control program. Accordingly, these external agencies will hold the NTLP accountable to continue to improve data quality and to move toward using program data to improve TB patient outcomes.

LESSONS LEARNED

IDENTIFYING STRENGTHS

Findings from internal and external assessments have improved register performance. NTLP conducted an assessment of the implementation TB/HIV collaborative activities and identified ways to address coordination of data collection and improve the TB register. Specifically the NTLP worked with each district to ensure a focal person is located in every TB clinic to provide supervision. There is now a focal person in each health clinic. An external assessment, PRISM, also identified challenges with data quality and completeness. This created an opportunity for the NTLP to engage stakeholders and identify interventions to improve TB registers. Strengthening the team approach has been integral to improving data collection and data quality.

Standardized monitoring and evaluation measures have been implemented across all TB facilities. One major strength of the NTLP is that the system of TB registers and records is universal in all TB health facilities (Wobudeya 2014a). Because the reporting is standardized by WHO, there is no pressure from external partners to increase data collection or make changes to the register. This register has been adopted internationally resulting in comparable TB indicators across many countries and regions. This helps funding partners to better understand the changing TB epidemic, especially in high HIV prevalence countries, and to adapt program interventions to better meet patient needs.

IDENTIFYING CHALLENGES

There continue to be poor linkages between TB and HIV care resulting in low case detection. The TB registers now capture TB/HIV collaborative activities. This works well in TB clinics where HIV testing and counseling is available or in HIV care centers that are in the same facility as a TB clinic. However, in Uganda there separate TB and HIV control programs remain. The result is that HIV-positive patients might have to go to a separate location for TB treatment. This requires extra work for the TB focal person to reconcile TB Suspect Registers from the HIV facility with the Laboratory Register, and Patient TB Card, all from different locations, in order to maintain a complete Unit TB Register. Without a strong referral system or resources to go into the community to track defaulters, HIV-positive patients may not be screened for TB or be captured in the register system.

Reporting remains inconsistent and incomplete across all registers. Key informant interviews highlighted that there is missing information on the TB Patient Card, which is used to update the TB Unit Register. Missing information results in incomplete information on the register and challenges in obtaining numerator and denominator data for the indicators. It is the DTS and facility focal person's responsibility to check for consistency in capturing data elements across the different registers (Wobudeya 2014). However, this is not systematic across health facilities. Secondly, laboratory confirmed patients may be entered in the Laboratory Register, but are not reported in the Unit TB Register. One reason for this discrepancy is that a patient may pick up laboratory results from the laboratory and take these results to a different TB clinic. Without proper documentation, it is difficult to track the suspect TB cases from one facility to another to ensure completeness of patient reports for TB testing and care (Mupere 2014).

Some non-government health providers do not utilize the standard reporting. Private, for profit (PFP) health providers do not report TB case detection and treatment outcomes. This is problematic for a health system that is seeking to detect every case, reduce TB transmission, and prevent poor treatment outcomes that may result in the development of MDR-TB. The UNION, through funding from USAID REACH project, has recently worked with the NTLP to strengthen the capacity of PFP laboratory testing and the availability of TB medications. All PFP should utilize a register reporting mechanism so the NTLP can track patient care through the health system.

KEY LESSONS

Registers can be adapted to meet changing health needs. Part of the overall Stop TB strategy includes a health systems strengthening component. Using this approach to TB control acknowledges that sustainable TB control requires a strong health delivery system, including accurate data capture through health registers. The NTLP prioritized strengthening program management through supportive supervision and quality assurance in order to fully implement TB/HIV collaborative activities. A solid foundation of using data for program evaluation also enables the NTLP to conduct operational research and participate in periodic assessments of data quality. Research is used to assess gaps in the ability of the TB health facilities to detect new cases of TB and use the system of registers to monitor cases throughout the treatment cycle. Results are also used to design interventions to strengthen data quality, including supportive supervision, and quality assurance programs. The NTLP continues to optimize TB/HIV collaborative activities and use data to improve delivery of TB care.

Supportive supervision and institutionalized quality assurance measures can improve data quality. Key informants agreed that quality assurance and the supportive supervisory role of the focal person in each health facility have improved data quality over time. Dr. Mupere stated, “quality assurance is the single most effective thing to improve the data quality” (Mupere 2014). This system of checks and balances ensures that the register is reviewed for completeness and accuracy in a systematic way. Providing performance feedback also helps to promote data collection and data quality. Dr. Wobeduya underscored that health facilities that have the most success in reporting and improving TB outcomes tend to have strong leadership at both the level of the focal person and the DTS. Continuous mentorship implies taking supportive supervision to the next level; a supervisor who is engaged in the day-to-day tasks of the health facility workers and provides an extra level of motivation is the key element to success of the TB register (Wobudeya 2014).

REFERENCES

Aqil, Anwar, Theo Lippeveld and Dairiku Hozumi. 2009. "PRISM framework: a paradigm shift for designing, strengthening and evaluating routine health information systems." Health Policy and Planning 24(3): 217-228.

Aqil, Anwar. 2008 "PRISM Case Studies: Strengthening and Evaluating RHIS." Retrieved on April 8 2014 from http://www.cpc.unc.edu/measure/publications/sr-08-43/at_download/document.

Diedrich, Collin R. and JoAnne L. Flynn. 2011. "HIV-1/Mycobacterium tuberculosis Coinfection Immunology: How Does HIV-1 Exacerbate Tuberculosis?." Infect Immun 79(4): 1407-1417.

Godfrey-Faussett, Peter, Dermot Maher, Ya Diul Mukadi, Paul Nunn, Joseph Perriens and M. Raviglione. 2002. "How human immunodeficiency virus voluntary testing can contribute to tuberculosis control." Bull World Health Organ 80(12): 939-945.

Gunneberg, C., A. Reid, B. G. Williams, K. Floyd and Paul Nunn. 2008. "Global monitoring of collaborative TB-HIV activities." International Union Against Tuberculosis and Lung Disease 12(1): S2-S7.

Hargreaves, James R., Delia Boccia, Carlton A. Evans, Michelle Adato, Mark Petticrew and John D. H. Porter. 2011. "The Social Determinants of Tuberculosis: From Evidence to Action." Am J Public Health 101(4): 654-662.

Hotchkiss, David R., Anwar Aqil, Theo Lippeveld and Edward Mukooyo. 2010. "Evaluation of the Performance of Routine Information System Management (PRISM) framework: evidence from Uganda." BMC Health Services Research 10(1): 188.

Jeppsson, Anders and Sam A. Okuonzi. 2000. "Vertical or holistic decentralization of the health sector? Experiences from Zambia and Uganda." Int J Health Plann Manage 15(4): 273-289.

Laserson, K., L'Herminez, P.-Y. Norval and A. Trébucq. 2006. "Revised TB recording and reporting forms and registers – version 2006." World Health Organization. Retrieved on March 15 2014 from http://whqlibdoc.who.int/hq/2006/WHO_HTM_TB_2006.373_eng.pdf.

LoBue, Phillip. Yellowbook CDC Health Information for International Travel. Atlanta, Georgia: Centers for Disease Control and Prevention; 2014. Chapter 3, Infectious Diseases Related to Travel; p 78.

Ministry of Health. 2008. The Uganda Tuberculosis Communication Strategy. National Tuberculosis and Leprosy Control Programme. Kampala, Uganda. Retrieved on January 29 2014 from http://www.ustp.info/downloads/ncc/Edited%20TB%20communication%20strategy-13%20august%2008.pdf.

Ministry of Health. 2010. Manual of the National Tuberculosis and Leprosy Programme. Retrieved on November 20 2013 from http://idi-makerere.com/resources/cat_view/47-research-documents/49-treatment-guidelines.

Ministry of Health, Health Systems 20/20 and Makere University School of Public Health. 2011. Uganda Health System Assessment 2011. Kampala Uganda and Bethesda MD, Health Systems 20/20. Retrieved on January 29 2014 from http://health.go.ug/docs/hsa.pdf.

Mupere, E. 2014. Interview by UW START Program. January 25 2014.

Norval, P. Y., E. Heldal, R. L'Herminez, K. Laserson and A. Godfrey. 2008. "Revising the tuberculosis recording and reporting information system." Int J Tuberc Lung Dis 12(3 Suppl 1): 17-19.

Okoboi, Stephen. 2014. Interview by UW START Program. April 14 2014.

Okot-Chono, R., F. Mugisha, F. Adatu, E. Madraa, R. Dlodlo and P. Fujiwara. 2009. "Health system barriers affecting the implementation of collaborative TB-HIV services in Uganda." Int J Tuberc Lung Dis 13(8): 955-961.

Republic of Uganda Ministry of Health (MOH). 2005. Health Sector Strategic Plan II 2005/2006 – 2010/2011. Ministry of Health. Retrieved on December 2 2013 from http://aidsalliance.3cdn.net/22d7083647b56355fd_1rm6b88iw.pdf.

Republic of Uganda Ministry of Health. 2006. National Policy Guidelines for TB/HIV Collaborative Activities in Uganda. Ministry of Health. Retrieved on February 20, 2014 from http://www.who.int/hiv/pub/guidelines/uganda.pdf.

Republic of Uganda Ministry of Health. 2010. Health Sector Strategic & Investment Plan: Promoting People's Health to Enhance Socio-Economic Development, 2010/11-2014/15. Kampala, Uganda. Retrieved on January 29 2014 from http://www.unicef.org/uganda/HSSIP_Final.pdf.

Uganda AIDS Commission. 2012. Global AIDS Response Progress Report. Kampala, Uganda. Retrieved on March 12 2014 from http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce_UG_Narrative_Report%5B1%5D.pdf.

United Nations Development Program. 2013. Millennium Development Goals Report for Uganda 2013. Kampala, Uganda. Retrieved on December 12 2014 from http://www.us.undp.org/content/dam/uganda/docs/UNDPUg-2013MDGProgress%20Report-Oct%202013pdf.

United Nations Development Program. 2014. "Uganda." Retrieved March 29 2014 from http://www.ug.undp.org/content/uganda/en/home/countryinfo/.

USAID. 2008. Uganda Program for Human and Holistic Development (UPHOLD): The Integrated Social Services Project 2002-2008 End of Program Report. Kampala, John Snow Institute. Retrieved on March 28 2014 from http://pdf.usaid.gov/pdf_docs/Pdacp305.pdf.

van Gorkom, Jeroen, Philip Onyebujoh, Wilfred Nkhoma and Dermot Maher. 2002. Final report on a workshop to develop proposals for collaborative TB and HIV/AIDS programme activities Nairobi, Kenya, World Health Organization. Retrieved on March 4 2014 from http://whqlibdoc.who.int/hq/2002/WHO_CDS_TB_2002.309.pdf.

Wobudeya, E. 2014. Interview by UW START Program. April 4 2014.

World Health Organization. 2004. Interim Policy on Collaborative HIV/TB Activities. Stop TB Department and Department of HIV/AIDS. Geneva, Switzerland. Retrieved on March 4 2014 from http://www.who.int/hiv/pub/tb/tbhiv/en/.

World Health Organization. 2006. Guidelines on Co-Trimoxazole Prophylaxis for HIV-Related Infections Among Children, Adolescents, and Adults: Recommendations for a Public Health Approach. Geneva, World Health Organization. Retrieved on February 24 2014 from http://www.who.int/hiv/pub/plhiv/ctx/en/.

World Health Organization. 2012. Electronic recording and reporting for tuberculosis care and control. Geneva, Switzerland. Retrieved on March 2 2014 from http://www.who.int/tb/publications/electronic_recording_reporting/en/.

World Health Organization. 2013. "Uganda: Country Profile." Retrieved on November 30 2013 from http://www.who.int/countries/uga/en/.

World Health Organization. 2013. Global Tuberculosis Report 2013. Global Tuberculosis Programme. Geneva, Switzerland. Retrieved on November 20 2013 from http://www.who.int/tb/publications/global_report/en/.

World Health Organization, Stop TB Partnership, United States Presidents' Emergency Plan for AIDS Relief and The Joint United Nations Programme on HIV/AIDS. 2009. A guide to monitoring and evaluation for collaborative TB/HIV activities. Retrieved on February 24 2014 from http://www.who.int/hiv/pub/tb/hiv_tb_monitoring_guide.pdf.

APPENDIX A:

UGANDA'S NATIONAL TUBERCULOSIS PROGRAM REGISTERS PAGES AS OF 2010

TB LABORATORY REGISTER

Annex 8.4 TB Laboratory Register
Year_____ Name of Laboratory_____

Lab Serial No	Date	Name in Full and Telephone	Sex M/F	Age	Address: (1) County (2) Sub county (3) Parish (4) Village (LC1)	Name of Rx unit	Patient Number		Pre _ Rx or Follow up	Results Specimen		HIV Status CT1/ CT2/ CT3	Signature
							Suspect/ Unit No.	District TB No.		1	2		
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								
					(1) (3) (2) (4)								

UNIT TB REGISTER – LEFT PAGE

NATIONAL TUBERCULOSIS AND LEPROSY PROGRAMME (NTLP)
UNIT TB REGISTER

Unit TB No	Dist TB No	Name (in full), & Tel. No. or Contact Person	Sex M/F	Age	Address 1) District 2) County 3) Sub-County 4) Parish 5) Village 6) Nearest health unit	Date Treatment Started & Regimen	Disease Class (a) P/Pos P/Neg EP NSD	Type of Patient (b) N.R.F.D.O	Transfer In (c) From (1) Reason (2)	Results of Sputum Examination and Other Examinations and Date: PRE-Rx AFB (d)	PRE-Rx Other (e)	Follow up 2(3) (f)	Follow up DST (g)	Follow up 5	Follow up (6)8
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						
					1) 2) 3) 4) 5) 6)				(1) (2)						

NOTES

(a) Record the Disease Classification as: **P/Pos** for sputum positive, pulmonary TB; **P/Neg** for sputum negative, Pulmonary TB; **EP** - Extra Pulmonary TB and the site (spinal, renal, lymph node), and **NSD** for No Smear Done.

(b) Record the Type of Patient as – **N** for New; **R** for Relapse; **F** for Failure; **D** for Default; **O** for Other.

(c) Record the referral unit from which the patient has been transferred in the first line and the reason for the transfer in the second line

(d) Record the results of sputum examination {**ND** for Not done; **NEG** for 0AFB/100 Fields, **1-9** for exact number if 1 to 9AFB/100 fields; (+) for 10-99 AFB/100 Fields, (++) for 1-10 AFB/Field; (+++) for >10 AFB/Field} in the first line and the date when the sputum was examined in the second line.

(e) Record the Other type of test {Biopsy, Mantoux, CSF, X-Ray} and examination result in the first line and the examination date in the second line. For diagnosis of TB in children refer to recommended children algorithm.

(f) Record the examination result in the first line and date in the second line for: 1) A category 1 patient who has completed 2 months of treatment; 2) a category 1 patient whose treatment was prolonged to 3 months; 3) A category 2 patient who has completed 3 months of treatment.

(g) Record YES for whom Drug Susceptibility Testing (**DST**) has been requested in the first line and the date when DST was requested in the second line.

CODES: Y- Yes; N- No Date Format- **dd/mm/yy**

UNIT TB REGISTER – RIGHT PAGE

TB/HIV Activities: HIV Test C/CT/CT1/CT2 (h) Date	Patient Recvd HIV Result Y/N	CPT Y/N Start Date	ART Rx Y/N Start Date	Treatment Model F or C/Date Name of treatment supporter (i)	Issue of Anti-TB Drugs (10): Intensive Phase (Every 2 weeks) M1 2	M1 4	M2 6	M2 8	Continuation Phase (Monthly) 3	4	5	6	7	8	Treatment Outcome by Date: Treatment Completed (j) Smear Negative (Cured)	Smear result not available	Treatment Not Completed (k) Failure (Smear Positive)	Died	Transferred out Name of Unit/Date	Defaulted	Remarks

NOTES

(h) Record HIV Counseling and Test Results: **C** for Counseled; **CT** for Counseled and Tested; **CT1** for HIV Positive and **CT2** for HIV Negative.

(i) Record **F** if the patient is on health facility based DOT and **C** if the patient is on community based DOT (CBDOTS) and the start date on the first line; Record the name of treatment supporter assigned to a patient on CBDOTS in the second line.

(j) Record the date of dispensing drugs {**dd/mm**} in the first line and the number of days for which treatment is dispensed in the second line. Under Intensive Phase, record the information for month 3 for: a) A category 1 patient who remained sputum positive at the end of 2 months and was continued on intensive phase for one more month; b) A category 2 patients started on intensive phase for 3 months and in Month 4 for a category 2 patient who remained sputum positive at the end of 3 months and was continued on intensive phase for one more month.

(k) Record the date under 'Treatment Completed' if the full prescribed duration {6 or 8 months} of treatment has been given; Record the date under 'Smear Negative' if the sputum in the last month is negative and was negative once before {2 or 5 Months}; For Others record the date under 'Sputum Not Available'.

(l) If the prescribed duration of treatment was not completed, record the date of stopping treatment under the correct heading; if 'Transferred Out', record the date of transfer in the first line and the name of the health unit transferred to in the second line; If treatment was stopped because of failure of treatment, record the date of sputum result under 'Failure'.

DISTRICT TB REGISTER – LEFT PAGE

Annex 8.6 District TB Register part 1 and 2

Date of Registr.	HSD TB No.	Dist TB No.|	District	Names in full	Sex M/F	Age	Name of Treatment Unit (1) Unit where diagnosed (2) Unit for follow-up	Unit TB Numbers (1)Unit where diagnosed (2)Unit for follow-up	Date treatment started and Regimen	Disease Classification P/Pos P/Neg EP NSD	Type of Patient N, R, F, D, O	Transfer in From (1) Reason(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)
							(1)	(1)				(1)
							(2)	(2)				(2)

DISTRICT TB REGISTER – RIGHT PAGE

Annex 8.6 District TB Register part 1 and 2

Date and Results of sputum examination (Nos indicate month of treatment)				DST	TB/HIV				Treatment Model	Treatment Outcome by Date						Remarks
Pre-Rx	2(3)	5	6(8)	Date	HIV Test C/CT/ CT1/ CT2 Date	Pt Recvd HIV result Y/N	CPT Y/N Start Date	ART Rx Y/N Start Date	F OR C / Date Name of treatment supporter	Cured	Treatment completed	Died	Failure	Defaulted	Transferred out Name of Distr. Date	

Annex 8.7

SUB-COUNTY HEALTH WORKER REGISTER

DRUG DELIVERY AND PATIENTS' ADHERENCE

TB No 1)District 2) Unit	Name in full and Telephone No.	Address 1) Parish 2) village	Issue of Anti TB drugs and Patient's Adherence 1)Drug delivery date 2) No of Missed doses										Treatment Outcome	Name of Treatment Supporter and Telephone No.
1		1	1											
2		2	2											
1		1	1											
2		2	2											
1		1	1											
2		2	2											
1		1	1											
2		2	2											
1		1	1											
2		2	2											

Annex 8.13

National TB/Leprosy Programme (NTLP)
Register of TB suspects

Year_____

Date	TB Suspect Number	Name of TB suspect	Sex M/F,	Age	Address 1) District 2) Sub county 3) Village/LCI/Zone	Result of HIV test	Date Sputum sent to laboratory	Date results received	Results of sputum examination Specimen 1	2	Date TB started and Unit TB No.	Remarks
					1) 2) 3)							
					1) 2) 3)							
					1) 2) 3)							
					1) 2) 3)							
					1) 2) 3)							

Annex 8.8

NATIONAL TUBERCULOSIS/LEPROSY PROGRAMME

QUARTERLY REPORT ON NEW AND RETREATMENT CASES OF TUBERCULOSIS

Patients registered during quarter of [ ] **20**

Name of District TB/Lep Supervisor (DTLS) _____ **District** _____

Date Form Completed: _____ **Signature** _____

A) NEW CASES, RELAPSES, FAILURES AND DEFAULTERS:-

PULMONARY TUBERCULOSIS																				
SMEAR POSITIVE									SMEAR NEGATIVE						NO SMEAR DONE					
New Cases			Relapses		Failures		Defaulters		New		Relapse		Defaulter		New		Relapse		D, F	
M	F	T	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F

EPTB		TOTAL ALL TYPES TB		
M	F	M	F	OVERALL

B) SMEAR – POSITIVE NEW CASES:

Age group	0 –4	5 – 14	15 – 24	25 - 34	35 – 44	45 - 54	55 – 64	65+	TOTAL
Male									
Female									

C) TB/HIV SECTION FOR TB PATIENTS REGISTERED DURING THE QUARTER

Type of patient	No. offered HCT		No. tested for HIV		No. HIV pos.		No. on CPT		No. on ART	
	M	F	M	F	M	F	M	F	M	F
New smear Pos. TB										
New smear neg. TB										
EPTB										
Other types of TB										
Total										

D) PATIENTS REGISTERED DURING THE QUARTER ON DOT

Sex	DOT Status		
	Number registered TB patients	Number on facility based DOT	Number on community based DOT
M			
F			

Explanations:-

- 1st quarter = Jan. Feb. Mar., 2nd quarter = Apr. May Jun
  3rd quarter = Jul. Aug. Sep., 4th quarter = Oct. Nov. Dec.
- Block 'B' is the breakdown of the totals in the first three boxes in block 'A'
- Patients that are registered in the District Register as TRANSFER IN do not appear on this report
- Block "C" is a breakdown of TB patients registered during the quarter by TB/HIV services offered.
- Block "D" is a breakdown of "DOT" status of patients registered during the quarter
- Patients are reported in the quarter in which they are registered in the District TB Register. Thus, the patient may be diagnosed and put into Treatment's Unit Register at the end of March, for example, but only registered into the District Register in April – he will appear in the statistics for the 2nd quarter. This means that the DTLS can begin to work on the statistics on the first day of the next quarter.
- The report should be handed to the Zonal Supervisor before 15th of the month following the end of the quarter being reported on. ZTLS will validate and forward the reports to the Ministry of Health by 28th of the same month.
- Please keep the district register up to date; otherwise you will not be able to fill this form correctly and in time.

11th August 2009 1