



# Implementing QuanTB to Improve Forecasting, Supply Planning, and Early Warning Systems for TB Medicines: Zambia Report

August 2016



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# **Implementing QuanTB to Improve Forecasting, Supply Planning, and Early Warning Systems for TB Medicines: Zambia Report**

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August 2016





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## **About SIAPS**

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to ensure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

## **Recommended Citation**

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## ACRONYMS

EWS	early warning system
GDF	Global Drug Facility
LMIS	logistics management information system
MDR-TB	multidrug-resistant tuberculosis
MSL	Medical Stores Limited
MOH	Ministry of Health
NTP	National Tuberculosis Control Program
PSM	procurement and supply management
SIAPS	System for Improved Access to Pharmaceuticals and Services
USAID	US Agency for International Development

## **ACKNOWLEDGMENTS**

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## INTRODUCTION

This report summarizes the information gathered as part of a review of the implementation of QuanTB and related technical assistance to strengthen TB pharmaceutical management in Zambia.

### Background

TB is a preventable and curable infectious disease that ranks alongside HIV/AIDS as a leading cause of death worldwide. If untreated, the disease can be debilitating and can kill approximately 50% of those infected. Proper forecasting, supply planning, and stock monitoring are key to ensuring an uninterrupted supply of TB commodities to meet the evolving needs of TB programs as treatment is scaled up and treatment regimens change. The US Agency for International Development (USAID)-funded SIAPS Program has provided technical assistance to NTPs in 12 USAID-focus countries since 2013. SIAPS regional or in-country technical advisors have collaborated with NTPs to address challenges that hamper uninterrupted access to TB medicines, such as the lack of reliable information for effective decision making in TB supply chain management, an early warning system (EWS) to prevent stock-outs or expiries, and supply chain system monitoring mechanisms, as well as limited institutional and human resource capacity in these areas. The support included the use of QuanTB—an electronic forecasting tool and EWS that transforms complicated calculations into a user-friendly dashboard that displays key quantification and supply planning information and alerts on risks of stock-outs or expiries<sup>1</sup>. Implementation of the tool was complemented by other SIAPS TB technical assistance activities, such as quantification capacity-building training and participation in country monitoring missions.

### ***Key Gaps that Necessitated QuanTB Implementation***

- Inadequate technical skills and a lack of reliable tools for quantification. Excel-based tools used for quantification made the process time consuming and tedious. This process could only be done once a year.
- Quantification was based on consumption as opposed to morbidity, which left a wide margin of error.
- The lack of a system to track expiries and stock-outs. The country experienced frequent stock-outs, particularly for second-line medicines.

SIAPS technical assistance and the implementation of the QuanTB EWS helped to address these gaps.

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<sup>1</sup> SIAPS Program. 2013. *QuanTB User's Guide*. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.



## Goal and Objectives

SIAPS conducted a review of its TB technical assistance and the QuanTB implementation in Zambia. Specific objectives were to determine:

- Key achievements or results of SIAPS QuanTB technical assistance in Zambia
- Experiences and perspectives of the beneficiaries from the NTP
- Challenges and lessons learned

This report summarizes key aspects and results of the Zambia review.

## Strategic Approach

SIAPS developed QuanTB to promote a systems strengthening approach to TB pharmaceutical management<sup>2</sup> through institutional and individual capacity building and strengthening data collection and quality. Key interventions that were implemented in Zambia included:

- *Capacity building*: One pharmacist from the NTP was trained on QuanTB for quantification and as an EWS to track expiries and stock-outs.
- *Support for data quality for input into QuanTB*: SIAPS provided technical assistance to the NTP to improve the quality of data used in QuanTB. SIAPS made recommendations to the NTP on collecting data on second-line patient enrollment and performing quarterly comparisons and analyses against targets/expected enrollment to ensure that realistic trends are used for forecasting.
- *Technical assistance for supply planning*: SIAPS provided technical assistance to the NTP for supply planning by using QuanTB to schedule deliveries and establishing a call down mechanism for second-line medicines to minimize overstock.
- *Provision of technical assistance in the introduction of new TB medicines*: SIAPS provided technical assistance for the phase in of new pediatric formulations and short course multidrug-resistant TB (MDR-TB) regimens. A comprehensive roll out plan of the new pediatric formulations and guidelines for the phase-in of the short course MDR-TB regimens were developed jointly with the NTP. QuanTB was used to quantify the requirements and inform the transition timeline.
- *Provision of technical assistance through program review*: SIAPS provided support through a regional senior technical advisor for TB PSM strengthening as part of the WHO program review team. Recommendations to improve TB medicine supply chain management were made and shared with the NTP. Key interventions will be part of the 2017–2022 national strategic plan.

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<sup>2</sup> SIAPS Program. 2013. *QuanTB User's Guide*. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

## RESULTS

### Process

SIAPS has provided TB technical assistance to Zambia's NTP since the country began using QuanTB in November 2013. At the time of this review, the regional senior technical advisor was based in Kenya. The country is using QuanTB for forecasting, procurement, supply planning, cost analysis, introduction of new drugs or regimens, and as an EWS. Data on TB cases is reported from facilities to districts using a manual system. The reports are aggregated at the districts and then from districts to provinces, which in turn provide aggregated data to the NTP. Data on MDR-TB cases are provided directly from MDR-TB treatment sites to the NTP. The MSL provides data on stock on hand at the national warehouse and the expiry dates. Currently, the NTP procures all of its medicines through the GDF, and the GDF's order tracking system is used as a source of data on pending supplies and the expected time of arrival.

### Beneficiary Experiences

The key beneficiary for QuanTB has been the NTP. The NTP pharmacist and a senior technical advisor to the NTP (USAID/Global Fund) had the first-hand opportunity to experience the benefits of using QuanTB. They described the tool as revolutionary. It is very easy to use and simplifies the quantification process. Quantification can be done within a few hours if all data are available. The dashboard makes monitoring stock status and expiries and planning for procurement shipments very easy. The dashboards are shared with stakeholders during the monthly commodity security meetings, and action points are agreed upon. The use of QuanTB in phasing in new pediatric formulations and the short course MDR-TB regimens while avoiding wastage of the old formulations is of great benefit to the NTP.

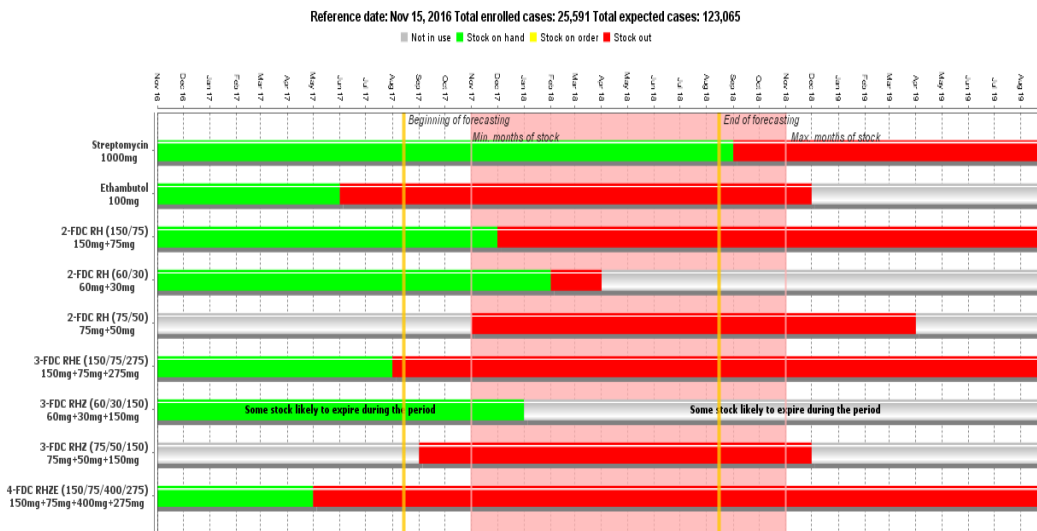
### Accomplishments

Key accomplishments and results of SIAPS TB technical assistance and the QuanTB implementation in Zambia include:

- *Adopted and institutionalized QuanTB:* The tool was adopted and institutionalized as the national quantification tool.
- *Enhanced NTP quantification capacity and skills:* SIAPS provided technical assistance to enhance the country's TB medicine quantification capacity and skills. The NTP pharmacist was trained on QuanTB using data provided by the MOH and MSL.
- SIAPS supported MOH staff, including the NTP manager and PSM staff, to participate in the Global TB Supply Chain Meeting in Bangkok, Thailand, in March 2015. During the meeting, the country was able to share experiences, learn from others, prioritize its key TB supply chain challenges, and agree on interventions to improve the regional situation.

- *Improved forecasting and supply planning:* With QuanTB, quantification is reviewed quarterly to allow for better planning. The EWS reports are generated monthly and discussed during monthly commodity meetings. The EWS has helped the NTP implement a call down system for second-line medicines.
- *Implemented the EWS to prevent stock-outs and wastage of TB medicines:* SIAPS has provided support to Zambia’s MOH/NTP in quarterly monitoring of TB stock status since November 2013. The support includes reviewing and analyzing QuanTB outputs and using QuanTB dashboard alerts to propose appropriate corrective actions. TB stock status monitoring has informed corrective actions in cases of national-level stock-outs. Key decisions made based on EWS reports include:
  - Shipments of second-line medicines pyrazinamide and cycloserine were expedited to avert a stock-out in September 2015.
  - A decision to call down second-line medicines every six to eight months rather than having a single delivery was implemented following numerous indications of overstock.
  - A data quality audit was conducted for MDR-TB patient data following the detection of a wide variation between expected and actual enrollment that resulted in an overstock of second-line medicines. Pediatric enrollment targets were also revised based on similar trends.

**Sample QuanTB Dashboards**



**Figure 1. First-line medicines**

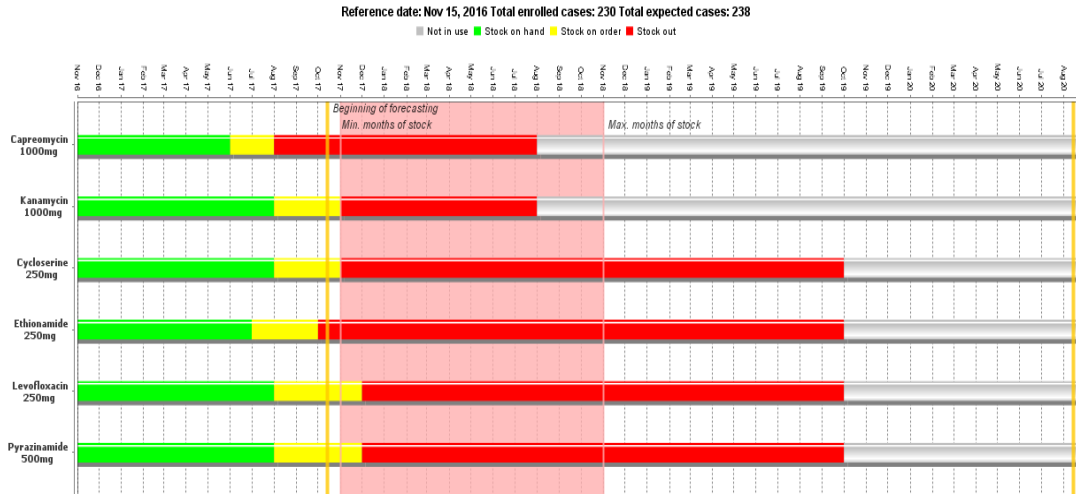


Figure 2. Second-line medicines

- *Tracking key supply chain indicators:* The implementation of QuanTB has enabled the NTP to track key indicators, such as months of usable stock on hand, number/percentage of medicines out of stock, procurement lead times, and months of stock of expected supplies.

### Trend of Stock-outs of TB Medicines

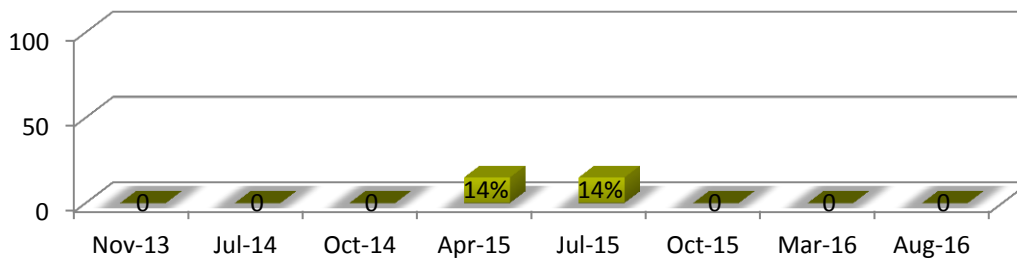


Figure 3. Percentage of stock-outs of second-line TB medicines<sup>3</sup>

There were no stock-outs of first-line TB medicines, and almost no stock-outs of second-line TB medicines between November 2013 and April 2016. The 14% stock-out of second-line medicines between April and July 2015 was due to a delay in delivery of an order from the GDF. The country had not correctly factored in all GDF internal processes.

## Challenges and Lessons Learned

### Challenges

- Prolonged lead times resulting from internal government bureaucracy and delays in the approval of price quotes from the GDF, as well as delays by the GDF in expediting deliveries, which resulted in emergency situations.

<sup>3</sup> GDF order tracking system

- Inadequate staff at the NTP: Only one NTP staff member has been assigned to PSM, resulting in delays in the implementation of activities and recommendations. Only one person is trained on QuanTB.
- Inadequate funding and prioritization of PSM activities by the MOH: This has hampered staff capacity building, supportive supervision, and distribution and data quality support activities.
- Inaccurate patient data, which leads to errors in quantification.
- Ambitious targets, particularly for pediatric and second-line medicine patients, leading to overstock situations when the patient enrollment targets are not met.
- Although the distribution system is efficient, the current pipeline is too long because some buffer stocks have to be maintained at the national, provincial, and district levels. The NTP and the MOH should have a long-term plan to shorten the pipeline.

### ***Lessons Learned***

- Strong partnerships with in-country partners are key, particularly in countries with no SIAPS technical advisor or office to leverage resources and coordinate support to the MOH.
- Regular monitoring of TB stock levels against patient enrollment is key to ensuring the early identification of potential wastage or stock-outs of TB medicines. However, more effort is needed to address other factors contributing to overstocks or stock-outs of TB medicines.
- Beyond having an easy-to-use forecasting, supply planning and stock monitoring tool and staff with the capacity to use that tool, there are other factors that affect the supply of medicines, such as government bureaucracy and delays by suppliers.

### **Gaps for Future Consideration**

- Strengthen the NTP's PSM department by providing at least one additional staff person who is fully dedicated to PSM activities.
- Allocate adequate resources to PSM central-level coordination activities, supportive supervision, distribution audits, and capacity building for both central- and peripheral-level staff.
- Adopt an electronic logistics management information system (LMIS) to improve the stock situation in terms of location and quantities all the way down to the health facility level. A modification of the current eLMIS would be appropriate.
- Consider introducing the delivery of first-line medicines at the district level to harmonize with the current MSL system and reduce the length of the pipeline.

## **CONCLUSION**

With USAID/SIAPS technical assistance, the Zambia NTP has used QuanTB to improve quantification, monitoring of stock-outs and expiries, supply planning, and monitoring of key supply chain performance indicators. The trend of stock-out rates of TB medicines is a good indicator of the achievements of implementing the tool and related TB technical assistance.