Implementing QuanTB to Improve Forecasting, Supply Planning, and Early Warning Systems for TB Medicines: Democratic Republic of the Congo Report

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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

CONTENTS

ACRONYMS

DRC	Democratic Republic of the Congo
EWS	early warning system
GDF	Global Drug facility
LMIS	logistics management information system
MOH	Ministry of Health
NTP	National TB Control Program
PNLT	Programme National de Lutte Contre la Tuberculose
PSM	procurement and supply management
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
TB	tuberculosis
USAID	US Agency for International Development

ACKNOWLEDGMENTS

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 DRC.

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 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[1]. 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.

DRC is a low-income country in Central Africa with a 2015 population of approximately 77.3 million and a life expectancy at birth of 57.2 years for males and 60.1 years for females[2]. In 2014, the prevalence of TB was 532 per 100,000 population, and 116,894 TB cases were reported[3]. The country is divided into 26 provinces and districts that include territories/rural zones and independent cities. In 2014, the public health expenditure comprised approximately 36.9% of the total health expenditure[4]. The health system is funded primarily by donor funds, including the Global Fund, and minimally through the government's public health budget. The Global Fund contributes 90% of the budget for TB commodities, with other partners and the government also contributing.

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[1] 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.

[2] World Development Indicators. Available at: http://data.worldbank.org/indicator.

[3] WHO Global TB Report DRC Country Profile. Available at: https://extranet.who.int/sree/Reports?op=Replet&name=%2FWHO_HQ_Reports%2FG2%2FPROD%2FEXT%2FTBCountryProfile&ISO2=CD&LAN=EN&outtype=html.

[4] World Development Indicators. Available at: http://data.worldbank.org/indicator.

Key Gaps that Necessitated SIAPS TB Technical Assistance and QuanTB Implementation

- *Inadequate forecasting and supply planning:* Inadequate institutional and staff capacity to forecast and plan the supply of TB medicines has resulted in stock-outs, overstock, and expiries.

- *Lack of stock status monitoring and an EWS*: There was no monitoring system for stock status or pipeline management of TB medicines. There was also no proper EWS to flag medicine stock risks, which resulted in frequent stock-outs and expiry/wastage of TB medicines. Tracking of orders was a challenge due to inadequate pipeline information that led to long delays in delivery and too many emergency orders.

- *Data quality and reporting issues:* Ensuring the quality and timeliness of reports from facilities was challenging.

- *Challenges in monitoring TB patient enrollment:* There was no good tool to review and analyze actual patient enrollment relative to planned enrollment and its impact on the availability of TB medicines and related commodities.

- Other challenges included completing quantification after an extended wait for validation of the forecasts by the Global Fund and noncompliance with stipulated delivery deadlines.

The implementation of the QuanTB EWS is helping to address these gaps.

Goal and Objectives

The goal of this project was to conduct a review of SIAPS TB technical assistance and QuanTB implementation in DRC. Specific objectives were to determine:

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

This report summarizes key aspects and results of the review.

METHODOLOGY

Data were collected through a review of relevant background documents and reports; interviews with SIAPS TB staff; and remote data collection through telecommunication with SIAPS TB field advisors (using a questionnaire for SIAPS field advisors) and local beneficiaries of the technical assistance (using one questionnaire for active users of QuanTB and another for senior NTP officials/decision makers). Data were analyzed by content (mostly qualitatively) and by prevalent themes relating to key achievement or success areas. In addition, online experience and satisfaction surveys were conducted with in-country beneficiaries and global partners. Results of the online surveys have been reported separately[5].

Strategic Approach

SIAPS developed QuanTB to promote a systems strengthening approach to TB medicines management[6]. As shown in figure 1, implementation of the tool is expected to strengthen the country quantification system through systemic institutional and individual capacity building. Optimum capacity at all levels of the hierarchy is key to ensuring timely reporting of valid data; timely updating of QuanTB files; and the generation of accurate forecasts, supply planning information, and EWS alerts. The information informs proper decision making and development and implementation of remedial actions through a technical working group or partner coordination forum.

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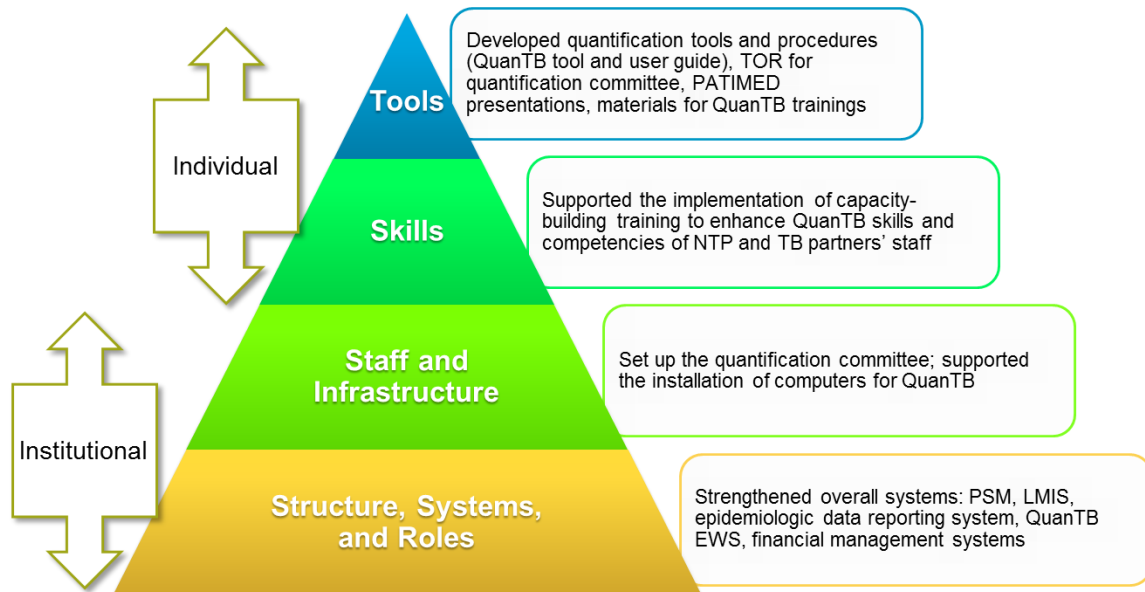
[5] Goredema W, Sawyer K, Mwatawala S, Owuna C. 2017. *Implementing an Early Warning System for TB Medicines: Global Report.* Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

[6] 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.

Figure 1. Systemic institutional and human resource capacity building in quantification[7]

Key interventions implemented in DRC at the time of the evaluation included:

- *Capacity building:* Key PNLT and TB stakeholder staff were capacitated in quantification of TB medicines using QuanTB.

- *Implementation of QuanTB for quantification, stock status monitoring, and as an EWS:* SIAPS provided individualized and targeted technical assistance to the PNLT and principal recipients for Global Fund grants. SIAPS also provides technical assistance to the PNLT and PATIMED TB stakeholders coordination forum to review and provide feedback on TB stock status.

- *Strengthening pharmaceutical supply chain management system:* SIAPS coordinated and supported pharmaceutical management supportive supervision in peripheral health centers. It also coordinated and collaborated with the PNLT to improve TB stock levels in the central medical store and strengthened the overall supply chain system.

- *Providing technical assistance during a Global Drug Facility (GDF) monitoring mission visit:* This support helped to strengthen quantification and the TB supply chain system.

- *Logistics management information system (LMIS):* This system supported and strengthened data collection, validation, and use for updating QuanTB.

- *Information and coordination:* SIAPS organized, facilitated, or participated in QuanTB meetings and workshops and in TB partner coordination, review, and data validation meetings.

- *Pharmacovigilance:* Support was provided to improve pharmacovigilance system-strengthening activities.

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[7] *Adapted from*: Potter C, Brough R. Systemic capacity Building: A Hierarchy of needs. Health Policy and Planning 2004; 19(5): 336–345.

RESULTS AND DISCUSSION

Process

SIAPS has provided TB technical assistance in DRC since March 2015. A designated in-country senior technical advisor provides direct technical assistance to the Ministry of Health's (MOH) NTP to ensure continued access to TB commodities by strengthening pharmaceutical systems, information systems, and overall pharmaceutical supply management. The NTP implemented QuanTB in July 2015, prior to which it used a Union Excel tool for quantification. The MOH's PNLT implemented the tool with technical assistance from SIAPS and in collaboration with local partners and stakeholders for TB Control, including Caritas Congo ASBL (the principal recipient for a Global Fund grant), Action Damien, and Challenge TB. At the time of the evaluation the country was using QuanTB for forecasting, supply planning, and as an EWS. The PNLT focal point for QuanTB, which is based in the Pharmacy Services Unit, is responsible for managing QuanTB by collecting inventory management data and data on the numbers of enrolled and expected cases. The PNLT focal point collects and extracts relevant stock data from Excel sheets to track receipts, stock status, pending orders of TB commodities, and case data reported from the service level. The PNLT focal point validates the data and updates the QuanTB files and then executes the forecasts, analyzes the dashboards, and prepares a quarterly report of the quantification results, including forecasts, pipeline information, areas of concern, and recommendations on proposed solutions to address identified problems. The QuanTB reports are presented to senior PNLT officials and decision makers and to PATIMED forum members. The results and recommendations are reviewed, revised as needed, ratified, and transmitted to the decision making hierarchy for action.

Beneficiary Experiences and Perspectives

Respondents rated key attributes of the tool favorably. They consider it a simple, user-friendly, fairly accurate, acceptable, reliable, cost-effective, and useful tool that readily provides key pipeline information and EWS dashboard alerts to inform actions to prevent or minimize stock-outs and expiry of TB medicines. They agree that the tool has improved the speed and timeliness of forecasting and supply planning and facilitates faster development and implementation of remedial actions. A senior PNLT official noted that he compares QuanTB and Union tool results to get a sense of "what is going towards the same direction" and uses the PATIMED forum's QuanTB-based recommendations to follow-up on pipeline and stock-related issues that are flagged. The senior official noted that the SIAPS QuanTB and related TB technical assistance have contributed to strengthening the NTP's capacity and information system and to improving patient care. Local counterparts appeared optimistic that over time, when the PNLT is fully capacitated, experienced, and confident in using QuanTB; good quality and valid data are used to update the tool; and the forecasts and related pipeline information and dashboard red alert recommendations are followed and executed, SIAPS TB technical assistance and the implementation of QuanTB would help eliminate the above-mentioned challenges.

Accomplishments

Key accomplishments and results of SIAPS TB technical assistance/QuanTB implementation in DRC include:

- *Adopting and institutionalizing QuanTB:* The PNLT is working on institutionalizing QuanTB as the national quantification tool for TB commodities.

- *Enhancing PNLT quantification capacity and skills*: SIAPS provided technical assistance to enhance the in-country TB medicine quantification capacity and skills and to develop the procurement and supply management (PSM) budget for the concept note for Round 9 of the Global Fund grant proposal This included holding a QuanTB capacity building training workshop in May 2015 with key staff from the MOH and TB partner organizations, such as Action Damien and CARITAS CONGO ASBL. The first QuanTB forecast took place in July 2015.

- *Improved forecasting and supply planning*: The country has used QuanTB in tandem with a pre-existing, Excel-based tool (developed by The Union—"Union tool") since July 2015. SIAPS supported the PNLT in the development of the terms of reference of the quantification committee and provides ongoing support to update QuanTB and produce the quarterly QuanTB report with appropriate recommendations for managing TB commodities. However, the tool has not yet been officially adopted as the national quantification tool for TB commodities. The country is currently using QuanTB on a limited scale at the national level to forecast and plan supplies of TB medicines; monitor stock status; generate EWS alerts; and take appropriate actions to mitigate stock-related risks such as stock-outs, overstocking, and expiry of the medicines. This is done through the PATIMED TB partners' coordinating forum. SIAPS provided technical assistance to the PNLT to quantify first- and second-line medicines for 2016 to be included in the PSM plan for the Global Fund grant proposal. The results were presented at PATIMED in November 2015. SIAPS collaborated with The Union to provide technical assistance to the PNLT for quantifying TB medicine needs for 2017. The QuanTB quantification results were compared to those obtained with the Union tool. The needs and related costs of the products and other inputs were also quantified.

- Each quarter, QuanTB forecasts and related outputs, including updated data on the number of enrolled patients and stock on hand by expiry date, are reviewed in the PATIMED forum and used to improve procurement, supply planning, and supply chain logistics management of TB commodities. The forecasts are used to develop PSM plans for Global Fund grant applications and for procurement requests. SIAPS provides hands-on technical assistance during the actual quantification of first- and second-line medicines. QuanTB data enable the PNLT to quickly estimate medicine needs during the introduction of new medicines, such as bedaquiline. The country can now easily estimate quantities for interim procurements by the central medical store and to cover the gap while awaiting pending GDF consignments.

- *Implemented an EWS to prevent stock-outs and wastage of TB medicines:* SIAPS has provided support to the MOH/PNLT Pharmaceutical Supply Management Technical Working Group for ongoing monitoring of the TB medicine supply pipeline. The support includes reviewing and analyzing QuanTB dashboard outputs and raising alerts on medicines that are under- or overstocked or about to expire. This has triggered corrective actions by the PNLT, PATIMED forum, central medical store, and suppliers to address identified problems. Decisions have also been made to redistribute, expedite, or delay GDF shipments based on QuanTB dashboard alerts and overall pipeline monitoring. For example, RH 150/75 was at risk of stock-out during the quarter ending September 2015. RHZE 150/75/400/275 and RHE 150/75/275 were also out of stock, and QuanTB EWS dashboard alerts informed recommendations and subsequent actions to expedite customs clearance to shorten the stock-out period. While there was a risk of stock-outs of at least one first-line medicine during the quarter, the products were received, thereby eliminating the threat of a stock-out. Also, while there were nine red alerts of medicines with less than three months of stock, eight of those had expected delivery in time to avoid stock-outs. When stock was evaluated at the central level, some medicines had already been moved from the central to the provincial level, so the data used to update QuanTB were not accurate. It is recommended for future stock inventories to include the provincial level and avoid this problem.
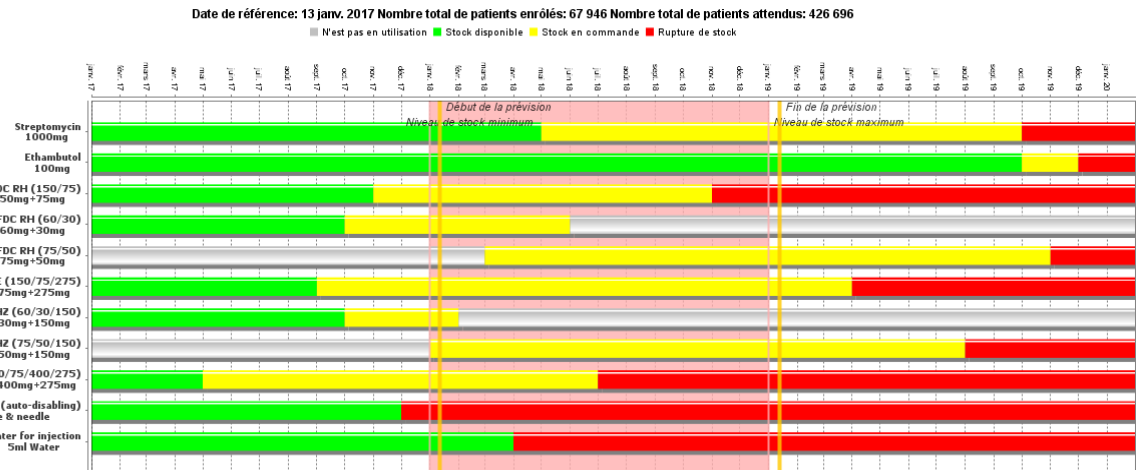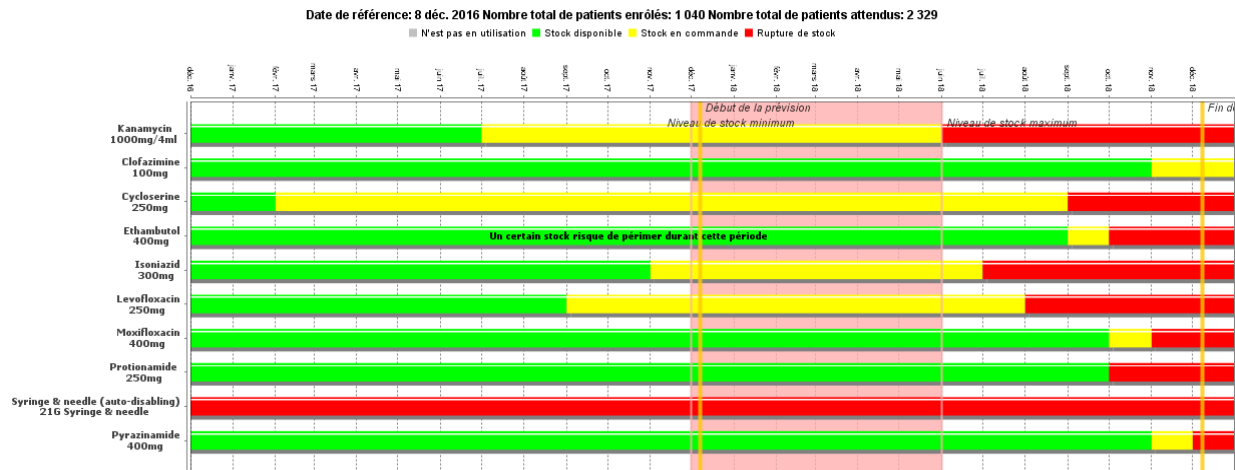
Sample QuanTB Dashboards[8]

Figure 2. First-line medicines

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[8] SIAPS. May. 2016. Monitoring TB Medicine Availability: Quarterly Report – DRC

Figure 3. Second-line medicines

Trend of Stock-outs of TB Medicines[9]

There was no stock-out of second-line medicines between September 2015 and May 2016[10,11].

- *Supported GDF monitoring missions and external TB program review:* The missions identified TB pharmaceutical supply chain challenges and recommended interventions to address them. SIAPS provided technical assistance and collaborated with the PNLT and other partners to address the identified challenges.

- *Strengthened information systems and improved data quality and reporting for informed decision making:* The use of QuanTB is improving the TB LMIS and reporting. Improved outcomes and impact in overall logistics management have been achieved at all levels by using possible opportunities to enhance staff skills and obtain their commitment to collect and report quality data.

- *Strengthened pharmaceutical management of TB medicines:* SIAPS is providing ongoing technical assistance to the PNLT in procurement and inventory management; updating of the TB medicine management guide; introducing bedaquiline and other new medicines; pharmacovigilance of TB and related medicines; and improving care of TB patients to strengthen overall pharmaceutical management for improved TB control.

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[9] ibid

[10] SIAPS. Sept. 2015. SIAPS TB Quarterly Report: QuanTB and Early Warning System Roll-out and Implementation. 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.

[11] SIAPS. May 2016. SIAPS TB Quarterly Report: QuanTB and Early Warning System Roll-out and Implementation. 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.

- *Promoted and advanced coordination and collaboration among PNLT and TB stakeholders and partners:* The implementation of QuanTB is promoting coordination, collaboration, information exchange, and team problem solving and decision making among the PNLT, PATIMED forum members, and other local TB partners and stakeholders.

- *Developed implementation materials, procedures, tools, and training materials*, including a TB medicines management guide, a QuanTB user guide, supply chain logistics tools, and QuanTB training materials.

- *Strengthened overall systems:* The EWS strengthened information for decision making by ensuring linkages between patient- and stock-related data to enable the early detection of potential over- and understocks; improving quantification and supply planning to improve procurement; monitoring stock status to inform the redistribution of commodities within and between countries in the event of under- or overstocks; building capacity through training and supportive supervision; and optimizing financial management systems by more accurately estimating national needs and decreasing wastage.

- *Improved services:* SIAPS TB technical assistance and QuanTB have reportedly contributed to improving teamwork to enhance quantification; improve inventory management; resolve stock management issues (stock-outs, overstock, expiry) through early alerts; improve TB LMIS data; and increase the efficacy of TB medicines.

- *Improved collaboration:* Strong collaboration was established among the MOH/NTP, SIAPS, and other partners.

Key Challenges and Lessons Learned

Challenges

- Although national-level data are readily available, it is challenging to get lower-level data. It is also difficult to collect quality, valid case and stock data, including peripheral data, and to update QuanTB files in time to produce quarterly reports. There is irregular availability of case data.

- The PNLT's ordering frequency and quantities are limited by budget constraints.

- QuanTB recommendations are not strictly applied.

- Internet connectivity is intermittent in the country, and computer hardware is outdated.

- The number of skilled personnel is insufficient, and QuanTB focal staff often have competing commitments. In general, key PNLT staff are not yet sufficiently capacitated and experienced in implementing QuanTB.

- To date, QuanTB has been implemented at the central level but not at lower levels.

- The process of transitioning from the Excel-based Union tool to QuanTB is slow.

- There is no designated budget to implement QuanTB.

Lessons Learned

- Strong partnerships with in-country partners are key to leveraging resources and coordinating support to the MOH, particularly in countries where there is no in-country SIAPS technical advisor or SIAPS office.

- 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.

- There is a need to provide support at the provincial level to achieve more countrywide improvements in disease management and TB medicine supply chain management.

Gaps for Future Consideration

- Continue to build in-country capacity and experience to implement the tool, including at lower levels of the supply chain. Implement ongoing staff capacity-building refresher trainings to mitigate the impact of staff attrition.

- Build in-country IT capacity to address QuanTB software problems as they arise.

- Improve data quality and data reporting from the periphery and include lower-level data when updating QuanTB.

- Expand the use of the tool to other areas/functions, such as procurement, cost analysis, the introduction of new TB medicines, and exporting data to other supply chain or LMIS tools

- The NTP proposes to proceed with testing or scaling up implementation of the tool at the lowest level and then to upper levels countrywide (i.e., from the health facility level to the provincial coordinators and then throughout the country).

- The PNLT needs a budget to implement the tool at different levels that takes into account all funding necessary for the tool to function.

CONCLUSION

With USAID/SIAPS technical assistance, the DRC MOH PNLT is progressively working on institutionalizing QuanTB EWS using a locally led, effective, and sustainable approach to improve forecasting, monitor stock, track expiries and stock-outs, make informed decisions, and take appropriate actions to close underlying pharmaceutical supply management gaps. As of July 2016, the tool had been in use for about a year and had not yet been officially adopted as the national tool for forecasting, supply planning, stock status monitoring, and as an EWS for TB commodities. The QuanTB recommendations are not yet strictly applied. The PNLT has no designated budget to implement the tool. Continued investment is needed to fully institutionalize the tool and address the remaining gaps. The PNLT and local partners and stakeholders should continue to coordinate and collaborate to sustain use of QuanTB.