THE INTRODUCING NEW TOOLS PROJECT (iNTP)

Strengthening of Connectivity of TB Diagnostic Instrument Networks in Tanzania

Country in Focus: Tanzania

Background

Tanzania is among the 30 countries with the highest burden of tuberculosis (TB), with an estimated 132,000 people falling ill with TB annually.[1] One of the specific objectives of Tanzania's National Strategic Plan (NSP) for TB and Leprosy 2021–2025 is to expand access to high-quality TB diagnosis.

Under this objective, the NSP emphasizes the need for strengthening of digital information systems to make data available for monitoring and evaluation of laboratory services. Existing information systems including TBLis, DHIS2-ETL, external quality assessment (EQA) reporting and GeneXpert instrument connectivity using the GxAlert/Aspect platforms have been identified as priorities for strengthening.

Since the introduction in Tanzania in 2014 of GxAlert, a first-generation connectivity solution from SystemOne (Northampton, USA) for GeneXpert instruments, the Central TB Reference Laboratory has periodically collaborated with implementing partners to engage SystemOne in strengthening and maintaining the system. However, this support was first discontinued in 2018 following the conclusion of the Challenge TB project funded by the United States Agency for International Development

[1] World Health Organization (WHO). Global Tuberculosis Report 2022. Geneva: WHO, 2022. https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022

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(USAID). The USAID-funded Infectious Disease Detection and Surveillance (IDDS) project was then able to support collaboration with SystemOne up until 2021, expanding connectivity to 220 GeneXpert instruments. An urgent need was identified in 2022 to resume support and further strengthen connectivity as the number of GeneXperts continued to expand and additional TB diagnostic technologies were being adopted by the country, including Truenat.

Project Description

Under the Stop TB Partnership/USAID *introducing New Tools Project* (iNTP), PATH was engaged between June 2022 and March 2023 to reinvigorate and strengthen connectivity. The scope of work included upgrading of the 220 GeneXpert sites that were already connected to GxAlert to the next-generation SystemOne Aspect software platform and establishing connectivity for 116 additional GeneXpert sites and new Truenat sites. Support was also provided to transfer data hosting from a cloud server to an in-country server. The project also aimed at building capacity of staff in use of all the functionalities of Aspect and in configuring the software. Requirements were also assessed for interoperability of Aspect with other digital information systems in use in Tanzania.

Project Implementation and Results

During the project period, PATH completed the following activities:

- SystemOne was engaged to migrate the data from a cloud server to a local server at the National Data Centre, and capacity was built among Ministry of Health information and communications technology (ICT) staff in server maintenance and troubleshooting.

- SystemOne was also engaged to transition the connectivity solution from GxAlert to Aspect and provided associated support services for the connection of GeneXpert and Truenat instruments. Some of the activities that are now able to be monitored through the Aspect dashboard include instrument performance in terms of numbers of functional modules, numbers of errors reported per reporting period, instrument utilization rates and downtime, calibration status and warranty tracking.

- Users were trained on data analysis using the Aspect dashboards and reports and on the use of other system features, including inventory management and commodity forecasting.

- 146 intelligent Metacom routers were procured as part of the required connectivity hardware.

- Logistical support was provided to identify, map, and engage cellular network providers across the country according to their network coverage and strength in different regions/areas in the country.

- Logistical and technical support was provided to map the scope and user requirements of electronic databases used in the country, including the electronic sample referral system, OpenLDR [Open Laboratory Data Repository], Integrated Disease Surveillance and Response / DHIS2, as well as their processes, guidelines and data required, to plan for interoperability of Aspect with TB surveillance and laboratory information systems.

As of March 2023, connectivity was established at 285/316 (90%) testing sites (see Table 1), covering 301/337 (89%) GeneXperts in the country. These sites were transmitting results electronically to clinicians through regional and district TB coordinators and to the Aspect dashboards, allowing regional and district TB coordinators to receive notifications on critical results, including MTB detected, rifampicin resistance results, instruments with overdue calibrations, reagent stock status and offline devices. Additionally, 18 Truenat machines installed by March 2023 were configured to Aspect.

Trained superusers conducting TB diagnostic connectivity troubleshooting on TB molecular diagnostic testing sites in Tanzania

A mapping of cellular network providers by preference and strength was completed, and the respective report is being used by the National TB and Leprosy Program (NTLP) to decide on providers for facilities. Through this project and in collaboration with SystemOne, a deep dive report on Aspect data was produced and disseminated to the NTLP for programmatic use. Requirements for Aspect interoperability were also identified, and relevant use cases were defined.

Table 1: Performance indicators before and at the end of project implementation

Performance Indicator	Performance before the start of the project	Performance at the end of the project
Percentage of testing sites using GeneXpert at which a data connectivity system has been established	234/316 (74%)	285/316 (90%)
Number and % of sites actively connected	174/234 (74%)	301/337 (89%)
Number and % of instruments/modules not operational	56/1,402 (4%)	4/1,402 (<1%)

Conclusion

The transition to Aspect and the further expansion and strengthening of connectivity in Tanzania has allowed for real-time visibility of the functioning of national fleets of GeneXpert and Truenat instruments and faster transmission of results to clinicians. The established connectivity system empowers the National TB and Leprosy Program and the Central TB Reference Laboratory to strengthen the testing networks by facilitating data-driven decision making. The availability of data has improved forecasting and enabled the monthly monitoring of testing trends, including the analysis of error rates, thus helping the national level staff to prioritize sites needing support. To ensure continuation of functioning of the established connectivity system, funding must be secured under a longer-term plan with local capacity supported to maintain the system. By strategically planning for a sustainable connectivity system and making optimal use of generated data, the country will benefit from consistently high instrument uptime, fast turn-around times to diagnosis and start of treatment, and more reliable access to rapid molecular diagnostics for people in need of testing.

For more information on PATH, visit: 🔍 http://www.path.org

For more information on Aspect, visit: 🔍 http://systemone.id/aspect

For more information on the introducing New Tools Project, visit:

🔍 https://www.stoptb.org/accelerate-tb-innovations/introducing-new-tools-project