

**Technical Approach:
USG-supported Xpert® MTB/RIF Roll-out
Version Date 8/28/2012**

A. Background

In response to the World Health Organization (WHO) endorsement of the Cepheid Xpert® MTB/RIF assay (Xpert), the United States Government (USG) is supporting implementation and impact assessment projects to facilitate in-country Xpert introduction in a systematic and coordinated manner. In an effort to maximize the impact associated with new diagnostic introduction, these projects not only aid in machine and test kit procurement, but also support Ministries of Health (MOH) by providing technical assistance on the coordination of partners, development of protocols, policies, and algorithms, training, data collection, and data analysis.

The USG, including the Centers for Disease Control and Prevention (CDC), the Office of the Global AIDS Coordinator (OGAC), and the United States Agency for International Development (USAID), has developed the following technical approach for Xpert roll-out in USG-supported projects to serve as a framework for initiating country-specific technical assistance. It is recognized that countries currently are working with a number of donors and partners and are in various stages of Xpert roll-out. Therefore, the entry point of the technical approach will vary by country and technical assistance should be adapted to meet specific country needs and local situations.

B. Technical approach

The approach is based on three key principles:

1. All technical assistance (TA) and support will be carried out in collaboration with the MOH and in line with the National TB Program (NTP), National AIDS Control Program (NACP), and National Laboratory Strategic Plans
2. Roll-out of Xpert in USG-supported projects will be carried out in a phased manner according to MOH policy, WHO policy, USG guidance, and global best practices. Evidence collected from projects will feed back to country and global knowledge sharing for refinement of policies and practices and to inform plans for scale-up
3. Roll-out of Xpert in USG-supported projects will be coordinated with the scale-up in the capacity to treat (including availability of both first- and second-line drugs and quality treatment services) and other diagnostic services (including access to culture and drug susceptibility testing (DST))

The approach consists of 5 major components¹:

1. *Coordinate efforts and define priorities and needs for Xpert implementation*

Purpose: To establish coordination mechanisms in the country and perform epidemiological and capacity analysis to guide implementation. To accomplish this, the following activities are recommended:

- a. Identify an MOH Xpert focal point for Xpert introduction in country
- b. Organize initial discussion about country needs for TA among NTP, NACP, USAID, CDC, and other relevant partners
- c. Form Country Xpert Advisory Team among stakeholders and define scope of work

¹ Components and activities are not listed in a time-specific sequence. Many activities will take place in parallel.

- d. Perform analysis of local prevalence and distribution of high-risk populations (e.g. TB/HIV co-infected communities, persons at risk for MDR TB) to assist with site selection. This information should be used to identify sites with the highest potential to detect additional cases, particularly smear negative and MDR-TB cases.
- e. Perform analysis of current TB first- and second-line drug treatment capacity including additional drugs needed for anticipated additional cases detected and current capacity and quality of treatment services
- f. Perform analysis of current TB diagnostic capacity and referral network (e.g. culture and DST for first and second-line drugs, smear microscopy and culture for treatment monitoring)
- g. Assign responsibilities and timelines to focal person, Advisory Team and other partners
- h. Identify barriers to future Xpert scale-up and develop plan to address gaps

These activities can be done initially through phone and email discussions but should culminate with an in-country workshop where stakeholders are invited to discuss priorities and needs for Xpert.

2. *Develop Xpert implementation plan, including the development and revision of key documents*

Purpose: To develop country plans for initial Xpert implementation including target groups, diagnostic algorithms and site selection. To accomplish this, the following suggested activities are recommended:

- a. Assess existing country policies for new diagnostic introduction
- b. Assess existing clinical and laboratory diagnostic algorithms and policies
- c. Assist MOH with revision of algorithms and policies, as needed
- d. Revise or develop clinical standard operating procedures (SOPs) including request and referral forms for suspect and patient management. Request and referral forms should include all variables needed for ongoing performance management and impact assessment of Xpert introduction, consistent with the USG M&E framework.
- e. Propose sites for phased Xpert placement in line with USG guidance² and WHO policy (e.g., priority placement at facilities providing initial diagnostic testing for HIV-infected persons with presumptive TB and persons with presumptive MDR TB, where a high volume of tests will ensure that equipment can be used near capacity, where specimen transport for Xpert, culture, and DST is not necessary or is rapid, where Xpert infrastructure requirements are met, with treatment capacity). For example, review service-level data to identify PEPFAR-supported sites with the highest volume of clients in care and treatment, where the near-point of care (POC) Xpert can be introduced, leveraging other PEPFAR laboratory infrastructure.
- f. Develop site checklist with all major operational/logistic components for Xpert implementation, including access to treatment and diagnostic referral networks
- g. Draft comprehensive plan/protocol for Xpert implementation including availability and access to first- and second-line anti-TB drugs and additional diagnostic services

These activities may be initiated during the in-country workshop for stakeholders. The Country Xpert Advisory Team, led by the Xpert focal point, should then continue this work with assistance from the NTP and technical partners.

3. *Prepare sites for Xpert implementation including adapting lab infrastructure and operations*

² Phased Implementation and Evaluation of Xpert MTB/RIF: Principal Considerations for USG-Funded Activities

Purpose: To ensure all infrastructure, operational and other needs are met to begin Xpert testing at designated sites. To accomplish this, the following suggested activities are recommended ensure that sites:

- a. Perform proposed site assessments according to the site operational/logistic checklist to are ready to install and perform Xpert
 - b. Select final sites based on results of assessment and develop plan for any necessary adaptations
 - c. Develop procurement and distribution plan for Xpert machines, cartridges and other equipment/supplies³ and order according to this plan
 - d. Ensure sites meet operational requirements to perform Xpert based on site assessment (i.e. storage facilities, ambient temperature, waste disposal plan, security precautions, etc.)
 - e. Install Xpert machines in selected sites, including UPS and other equipment
 - f. Develop and implement a plan for validation of Xpert at the site. This plan should be consistent with WHO and USG recommendations for verification and validation procedures.
 - g. Strengthen sputum collection and referral mechanisms
4. *Build capacity for Xpert implementation including training of site staff and clinicians, and support resources*

Purpose: To ensure that all staff have the necessary skills and resources to successfully use the Xpert assay and incorporate it into the country's diagnostic scheme. To accomplish this, the following suggested activities are recommended:

- a. Finalize Xpert implementation training plan and develop/revise curricula and training materials for Xpert technicians and clinicians
 - b. Train staff on use of Xpert, machine calibration, and algorithms
 - c. Develop and implement a plan for staff (refresher) training, including frequent supervision
 - d. Design technical support and problem solving mechanism for Xpert roll-out (e.g., availability of Cepheid designated technical support in the country or region)
 - e. Appoint staff or liaise with Cepheid service representative for annual Xpert calibration
5. *Support data collection and impact evaluation*

Purpose: To monitor routine Xpert implementation and evaluate the impact of roll-out on a number of outcomes and outputs. To accomplish this, the following suggested activities are recommended:

- a. Develop a monitoring and evaluation framework and data collection tools
- b. Advise on data to collect and indicators to measure (see Section C for a suggest list of illustrative outcomes)
- c. Revise program and lab registries and reporting forms to ensure appropriate and adequate data collection and reporting
- d. Assist NTP with baseline and project data collection and analysis

³ Within context of country clearance/customs procedures and capacity to store cartridges

The technical approach and associated activities will be further defined and refined as experience accumulates on the roll-out of Xpert continues.

C. Suggested Outcomes to Monitor

The USG is developing an Xpert monitoring and evaluation framework with defined programmatic and laboratory outcomes and outputs to help countries monitor routine Xpert implementation and evaluate short- and long-term impact of the assay. The framework will include globally relevant programmatic indicators (that can be supplemented to address country-specific needs) plus those laboratory and Xpert test specific indicators recommended by WHO. The list below includes outcomes to monitor and is currently being developed by the USG into a comprehensive monitoring and evaluation framework. Please refer to the forthcoming detailed M&E framework for guidance on what specific indicators will be required, indicator definitions, and other information related to performance monitoring and reporting.

TB Case Notification Rate <ul style="list-style-type: none"> • Among HIV-infected TB suspects • Among MDR-TB suspects
Health Service Delays <ul style="list-style-type: none"> • Time to detection • Time to initiation of appropriate treatment • Proportion on appropriate treatment • Proportion who died before treatment • Proportion lost to follow-up before treatment
Treatment Outcomes
Laboratory/Xpert Operations Outcomes (WHO suggested)
Indications for Xpert Testing (WHO suggested)