Expansion of Access to New Diagnostics for TB (EXPAND-TB)

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The 16th Core Group Meeting of the TB/ HIV Working Group
May 26-28, 2010, Almaty, Kazakhstan
Started in January 2009

• Initial project
  UNITAID Board approval: April 2008,
  16 countries; ~74,000 patients
  Time frame: 2009 – 2011

• Expansion project
  UNITAID Board approval: May 2009
  11 additional countries; ~56,000 additional patients
  Time frame: 2009 – 2013

• Revised Project Plan to cover 27 countries, ~129,000 patients, time frame 2009 - 2013
TARGETS

- Reduce the Diagnostic Gap
- Service up to 1/3 world population
- 30% MDR-TB estimated prevalence
- 27 countries
- Funding M$87 to WHO-GLI, WHO-GDF, FIND
- Assess and strengthen 101 labs
3 MAIN OBJECTIVES

- Improve control of MDR-TB
- Improve market dynamics
- Integrate tools in TB control programmes
3 PROJECT PHASES

Phase 1: Laboratory Preparedness
- Political commitment -- signing MOU - Prerequisite
- Lab assessments
- Infrastructure/biosafety
- Quality Assurance
- SOPs

Phase 2: Introduction of new diagnostics
- Procurement of commodities
- Integration of new diagnostics into screening and treatment guidelines (Training, Validation, Knowledge transfer)

Phase 3: Impact Assessment
- Continued support and oversight of technology transfer
- Impact measured and reported
- Ensuring GLP, IQC and EQA measures
SELECTION OF COUNTRIES

- High-burden MDR-TB Countries
- UNITAID eligible countries
- GLC approved project
- Partner support Infrastructure & Tech Transfer
A UNIQUE PARTNERSHIP MODEL

- Logistics and supplies
- Human Resources (Guidelines Technology transfer)
- Infrastructure
- Quality Assurance
- Linked referral systems and reporting

Funding for essential instruments, reagents, supplies

- Policies, norms international standards
- Participate in lab assessments
- Provide long-term, on-site monitoring
- Develop indicators and tools for M&E

- Negotiate with partners to ensure lowest prices
- Ensure customer support in place
- Share know-how from product development process
- Provide long-term, on-site mentoring for technology transfer

- Coordinate and manage procurement and delivery
- With FIND, engage industry to ensure affordability and sustained price decreases
- Collaborate with WHO pre-qualification to include diagnostics
WHAT IS INCLUDED IN THE PROJECT?

- **Initial and continuous assessment** of TB laboratories and TB labs networks

- **Procurement:**
  - Equipment for liquid culture/speciation and line probe assay
  - Reagents and consumables for project length

- **Training:**
  - Quality assurance and data management
  - Liquid culture and LPA
  - Biosafety and waste management

- **Follow-up** of the laboratories

- **Overall project management**
WHAT IS NOT INCLUDED IN THE PROJECT

- Premises for culture:
  Need for a negative pressure room
  Need for a strong biosafety level

- Premises for molecular biology
  3 different rooms are required for such analysis

- Equipment:
  Non-specific equipment is not included in the project, which needs to be covered by other financial sources

  ➔ Extra partnerships need to be established
IN-COUNTRY PARTNERS

**Ethiopia**
- MOH, PEPFAR-CDC, GAP/ILB, JHU & ICAP

**Lesotho**
- MOH, PIH, PEPFAR/CDC, WHO, URC, GF, BD, SAMRC

**Côte D’Ivoire**
- MOH, PNLT, IPCI; CAT Adjame, CeDReS, ASM, PEPFAR, EGPAF

**Uzbekistan**
- MOH, WHO, KfW (EPOS), GF, USAID, Euros Lab strengthening task force

**Myanmar**
- MOH, WHO, NTPL, AKK, JAICA, PSI, MSF, UNION

**Haïti**
- MOH, NTP, WHO, NPHL, NRLM, GHESKIO, Fondation Mérieux, CDC-PEPFAR, ASM, Cornell University
WORKSHOP: ACCESS TO TB DIAGNOSTICS
MOLDOVA_DEC 09

Participants (Heads of NRL) : Armenia, Azerbaijan, Georgia, Belarus, Ukraine, Moldova, Russian Federation, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan

5 day training sponsored by WHO-EURO office and coordinated by with SRL Borstel (Germany), FIND and WHO-GLI

Update on the TB diagnostics pipeline, potential for their implementation in the eastern and central Asian countries

Share experiences and lessons learnt on implementation of integrated laboratory strengthening activities at regional and national level

Prioritize activities to create conditions for rapid laboratory scale-up, human resource development and improved quality management in response to the WHA call for universal access to diagnosis

Become familiar with the "EXPAND-TB project" funded by UNITAID and coordinated by WHO-GLI, FIND and GDF

Discuss the 2010 plans (and beyond) for strengthening the national laboratory networks, introduction of the rapid diagnostic methods and drug resistance surveys

Scope: to create a platform where technical and funding partners, representatives from the National Reference Laboratories and the Supranational Reference Laboratories are sharing common views, experiences and plans for addressing the challenges of diagnostics and laboratory services in TB control
TRAINING WORKSHOP IN BANGKONG: Theory & Practice

11 trainees (India, Myanmar, Vietnam & Thailand)

10 day training with Exptb, CDC/GAP & NTRL Bangkok.

Train young TB personnel to perform and interpret quality assured liquid culture/DST/species ID

Using a standardized training curriculum
Extensive hands-on practice sessions
Several topics concerning quality assured laboratory practices (GLP, QA, QC measures)

Laboratory sessions for technical proficiency.

Basics of biosafety and adequate BSL3 laboratory layout
Sputum processing
PCR and DNA hybridization/management of spills

Pre and Post KAP (knowledge, attitude and practice) evaluation showed a significant increase.

Comment: "This training increased my understanding, basic knowledge and grasp of laboratory practices. The lectures were informative and our hands-on exercises will help us to organize things more efficiently in our homelaboratory."
PROGRESS AT A GLANCE

2009

- Kazakhstan
- Azerbaïdjan
- Swaziland
- DR Congo

2010

- Cambridge
- Moldova
- Georgia
- Belarus
- Uzbekistan, regional
- Lesotho, regional
- Ethiopia, regional
- Tajikistan
- Kyrgyzstan
- Senegal
- Peru
- Zambia
- Uganda
- Tanzania
- Kenya

- Haïti
- Côte d’Ivoire
- Myanmar
- India
- Uzbekistan
- Ethiopia
- Lesotho
- Djibouti
UZBEKISTAN

2 sites supported:

1 reference lab in Tashkent and 1 regional lab in Samarkand

Have started enrollment under ExpTB

Samarkand regional lab re-equipped by KfW, negative air pressure to be implemented by Exptb

Pilot drug resistance surveillance being finalized

A regional assessment visit is on planning in 2010.
LESOTHO

A Model for Scale UP

1 reference lab: QEH hospital
1 regional lab: Mafeteng government hospital

1-2006-2008: FIND, PIH and WHO renovated the NRL and reinforced microscopy services, streamlined culture and DST and introduced modern TB diagnostic methods.

2-2007: Established BS3, solid culture and DST and an EQA for smear microscopy within 4 months.

3-Liquid culture and DST were introduced a month later.

4-2008: A year later, introduced LPA for the rapid detection of MDR-TB

6-2009: The National TB/HIV Strategic Plan for 2008 – 2012 was finalized

2009 FIND conducted retraining for laboratory technicians at the NRL

Validation of new TB diagnostics algorithm presented

1 regional laboratory is currently being renovated, and biosafety facilities are being installed

7-Have started enrollment under ExpTB

Experience establishing tuberculosis laboratory capacity in a developing country setting

*Foundation for Innovative New Diagnostics (FIN Diagnostics), Geneva, Switzerland; †Ministry of Health, Maseru, ‡FIND, Maseru, †warrior Health Network, Maseru; §World Health Organization, Geneva, Switzerland

ABSTRACT  To describe the experience of strengthening laboratory diagnosis of tuberculosis (TB) in a resource-limited country with high TB-HIV co-morbidity. 
METHODS  In the Kingdom of Lesotho, which is confronted with high levels of TB, MDR-TB and HIV prevalence, between 2006 and 2009 a coalition of the Foundation for Innovative New Diagnostics, Partners In Health and the World Health Organization supported the National TB Reference Laboratory and reinforced microscopy services, introduced rapid diagnostic technologies and drug susceptibility testing (DST) and introduced modern TB diagnostic methods.

RESULTS  It was feasible to establish a biosafety level three facility for solid culture and DST and an external quality assessment programme for smear microscopy within 4 months. Liquid culture and DST were introduced a month later. Preliminary results were comparable to those found in laboratories in industrialized countries. A year later, line-probe assays for the rapid detection of MDR-TB was introduced.

CONCLUSION  Through strong political commitment and partnerships, it is possible to rapidly establish quality assured TB diagnostic capacity, including current methods in a resource-constrained setting. Collaboration and management for TB and MDR-TB have been greatly enhanced, from the field level, TB culture throughput in the laboratory increased twofold and has been sustained. This experience has served as a model to translate policies into practice with new diagnostic technologies. It supports global policy setting to enhance and standardize laboratory work in developing countries.

References

South Africa

Lesotho

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ETHIOPIA

8 sites supported:

2 central labs: EHNRI (NRL), St Peters Hospital and 6 regional labs: Mekelle, Bahir Dar, Jimma, Awasa, Adama (Nazret), Harrar

FIND involved since 2007 with full time consultant

Integrated HIV viral load testing with Line Probe Assay at central and regional locations

Refresher training in 2 central labs

Technical proficiency validated (sputum processing, SC, LC, LPA)

Negative Air Pressure and equipment installed at 6 regional labs, training planned

Inauguration March 2009
INDIA, UNITAID & GF

40 sites to be supported:

- 4 national reference lab, 27 intermediate reference state laboratory, 9 medical colleges

- Joint project involving UNITAID (EXPTB) and GF (CTD-MoH)

- In 2008, Collaboration Agreement GoI and FIND to demonstrate introduction Liquid Culture/LIPA/Species ID

- In 2010 FIND’s role as a sub-recipient for India’s GFr9:  
  - support of human resources in data management and lab support  
  - technical assistance and on-site training support for technology uptake.

- Signing of Expand-TB MoU and start of activities April 2010
COTE D’IVOIRE

3 sites in Abidjan:

1 central lab, IPCI, and 2 regional labs, CeDReS, CAT-Adjame handles 60% of all TB patients

Buildings under construction/renovation, BSL3 to be functional in Q2, 2010

In-country training is being coordinated by ASM/Exptb

- Training packages have been translated to French
- Liquid culture training will take place in Q2, 2010 when negative pressure in BSL3 is fully functional
- LPA training just conducted by Exptb
MYANMAR

2 sites

1 central lab, in Yangon and 1 regional lab in Mandalay

Equipment for 2 BSL3s shipped, installation completed

WHO country office acts as recipient of goods

MOH, Government of Myanmar in charge of customs clearance & shipping to sites

Exptb consultant coordinating all activities

Government of Myanmar has refurbished the lab areas

5 Lab techs underwent 2-week training in Bangkok
WHO POLICY UPDATE FOR TB DIAGNOSIS

- Current policy guidance
- Implementation of policies
- Policy framework at country level
- Diagnostic algorithms
CURRENT POLICY RECOMMENDATIONS

• 2007
  - Liquid medium for culture and DST
  - Rapid speciation

• 2008
  - Line probe assays for rapid MDR-TB screening
  - 2nd line DST to be used in a phased manner

Available at:
IMPLEMENTATION OF POLICIES
POLICY FRAMEWORK AT COUNTRY LEVEL

• Local epidemiology (TB, HIV, MDR-TB)
• Priorities for case detection
• Local laboratory capacity and networks
• Local laboratory human resources and skills base
• Local treatment policies for MDR-TB
• Financial resources
DIAGNOSTIC ALGORITHMS

Starts with

- Screening strategies for suspects
- Microscopy services as entry point
**Positive**

**Negative**

**No result**

**Microscopy** (ZN or Fluorescence)

**Culture** (Solid or Liquid)

**Identification (Speciation)** (Conventional/Commercial)

**Drug Susceptibility Testing** (Solid or Liquid)

- **MDR**
  - Not MDR, resistant other drugs
  - Susceptible
  - No result

- **XDR**
  - Not XDR, resistant other drugs
  - Susceptible
  - No result

**District**

**NRL/regional**

**SRL/NRL**

**Expand-TB**

EXPanding Access to New Diagnostics for Tuberculosis
Positive

Negative

No result

CULTURE (Solid or Liquid)

Positive

Negative or no result

No result

DRUG SUSCEPTIBILITY TESTING-1st LINE (Solid or Liquid)

MDR

Not MDR, resistant other drugs

Susceptible

No result

DRUG SUSCEPTIBILITY TESTING-2nd LINE (Solid or liquid)

XDR

Not XDR, resistant other drugs

Susceptible

No result

IDENTIFICATION (SPECIATION) (Conventional/Commercial)

LINE PROBE ASSAY

Positive

Negative or no result

No result

LED MICROSCOPY

Positive

Negative

No result

District NRL/regional NRL/ regional SRL/NRL

BSL1 BSL1 BSL3 BSL3
MDR-TB diagnosis using solid culture and DST

- Microscopy: 24h
- Solid culture: 6-8w
- 1st line DST: 3-4w

MDR-TB diagnosis after 9 to 12 weeks

MDR-TB diagnosis using liquid culture and DST

- Microscopy: 24h
- Liquid culture: 2-3w
- 1st line DST: 1-3w

MDR-TB diagnosis after 3 to 5 weeks

MDR-TB diagnosis using line probe assay, liquid culture and DST

- Microscopy: 24h
- Line probe assay: 24h
- Liquid culture: 2-3w
- 1st line DST: 1-3w

MDR-TB diagnosis after 1 to 2 days

MDR-TB diagnosis after 3 to 5 weeks
XDR-TB diagnosis using solid culture and DST

<table>
<thead>
<tr>
<th>Microscopy</th>
<th>Solid culture</th>
<th>1st line DST</th>
<th>2nd line DST</th>
</tr>
</thead>
<tbody>
<tr>
<td>24h</td>
<td>6-8w</td>
<td>3-4w</td>
<td>3-4w</td>
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</tbody>
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XDR-TB diagnosis after 12 to 16 weeks

XDR-TB diagnosis using liquid culture and DST

<table>
<thead>
<tr>
<th>Microscopy</th>
<th>Liquid culture</th>
<th>1st line DST</th>
<th>2nd line DST</th>
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</thead>
<tbody>
<tr>
<td>24h</td>
<td>2-3w</td>
<td>1-3w</td>
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XDR-TB diagnosis after 4 to 9 weeks

XDR-TB diagnosis using line probe assay, liquid culture and DST

<table>
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<tr>
<th>Microscopy</th>
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<th>1st line DST</th>
<th>2nd line DST</th>
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<td>24h</td>
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XDR-TB diagnosis after 4 to 9 weeks
THANK YOU

SPACIBO