Xpert MTB/RIF rollout; Botswana’s experience

Team Botswana
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(11th April 2013, Maputo)
Presentation outline

• Background context
• TB/HIV country profile
• MDR TB in Botswana
• Context of Xpert use in Botswana
• XPRES study
• Rollout planning
• Estimated 5 year cost projections
• Summary implementation Gantt chart
Background

• Botswana, land locked S. African country,
  – Borders with RSA to South & SE, Namibia to North & West, Zimbabwe & Zambia to North
• Pop: 2 038 228 (2011 Census)
  – Density of 3.5 persons/km²
• TB a public health concern
  – Accounts for >10% admissions & >5% OPD visits
  – Leading cause of death among PLWHA
Organization of Health services

- Tertiary level
  - Referral hospital (3)

- Secondary level
  - District (General) hospitals (15)
  - Primary hospitals (17)

- Primary level
  - Clinic (291)
  - Health post (350)

- Mobile stops (894)

Total: 676 Health facilities
• TB services delivered through network of 676 health facilities
  – MDR-TB care decentralized
    • 5 initiation sites
• ARV services available in 302 service points
  – All hospitals
  – Most clinics
  – Outreach points
TB/HIV country profile

• Trends in TB burden
  – Have always mirrored trajectory of HIV epidemic
  – Gains in TB control eroded with advent of HIV
  – With national roll-out of ART (98% by Dec 2012)
    • Sustained ↓ spiral in TB since 2002
    • Estimated Incidence in 2011 was 455
TB notification rate by district/100,000 pop; 2010

TB/HIV co-infection rates by district (%); 2010
MDR-TB in Botswana

- 4 Drug Resistant Surveys since 1995
  - Sustained upward spiral in prevalence
    - >12 fold increase between 1st & last survey
  - Prevalence among retreatment cases, 6.6% in 2008

![MDR-TB trends among NEW](chart.png)
MDR-TB in Botswana

- Cumulatively;
  - 519 Lab confirmed since 2007
    - 405 (78%) ever put on Rx
    - 46 (9%) died before Rx
      - Of which 38 (83%) before 2010
    - 68 (13%) unaccounted
      - Of which 60 (88%) before 2010

Comparison of Lab confirmed MDR-TB & Cases ever put on Rx.

Source: NTRL & BNTP surveillance data as at May 2012
Context of “Xpert” use

• December 2010
  – WHO endorsed Xpert MTB RIF & recommended roll-out in country
  • Within context of national plans for management of
    – TB, MDR-TB & HIV associated TB
Context of “Xpert” use

• In response
  – TB manual updated to recommend use of Xpert for;
    • HIV positive TB suspects
    • High risk groups of DR-TB:
      – Retreatment patients
      – Symptomatic contacts of MDR-TB
      – HCWs presenting with TB symptoms
“Birth” of XPRES

- X-pert Package Rollout Evaluation Study (XPRES)
  - To evaluate operational challenges in use of X-pert in HIV care settings
- 14 machines
  - 4 at Points of care (POC)
    - The rest Lab based
  - In 13 districts with high HIV & TB/HIV burden
- 8 machines deployed
  - Step wedged design
Rollout planning

- National TWG constituted
  - Membership from MOH (DPH, DHAPC, DCS), WHO, CDC, KNCV, ACHAP, U-Penn, Baylor, BHP
- Draft Rollout plan put together
- Resource mobilization ongoing
  - WB commitment for additional 20 machines
Rollout planning

• Considerations for additional machine placement
  – Geo coverage of XPRES machines
  – Need to ensure countrywide coverage
  – TB/HIV case load per facility
  – Point of care vs lab placement to ▼ TAT
  – Centrality of facility to ease sample referral
**Figure 1: Algorithm for ambulatory management of patients with presumptive TB, using Xpert MTB/RIF**

**TB suspect (NO danger signs)**

- **HIV (+ve) or Unknown**
  - HIV test
  - Xpert MTB/RIF
    - Xpert MTB+ RIF+
    - Xpert MTB+ RIF-
    - Baseline AFB for treatment monitoring
    - -LPA, Culture & DST
    - -Refer to MDR treatment site
    - *ART, CPT
    - -Treat for TB
    - *ART, CPT
  - Xpert MTB- RIF-
    - PTB Unlikely
    - -Assess for EPTB, CXR or other diseases
    - EPTB Likely
      - Treat for EPTB
      - *ART, CPT
    - EPTB Unlikely
      - -Treat for bacterial infection
      - -Consider PCP
      - -HIV treatment assessment
      - -CPT
    - Reassess for TB
    - -Repeat Xpert
  - No or Partial response

- **HIV (-ve)**
  - YES
  - High risk for Drug resistant TB
    - Retreatment for TB
    - History of IPT or ATT for >1 month
    - Symptomatic MDR contact
    - Symptomatic HCW
  - NO
    - 2 x Sputum for AFBs
      - AFB (+)
        - Treat for bacterial infection
        - No or Partial response
        - CXR & repeat Sputum
      - AFB (-)
        - AFB (+) or CXR suggestive
        - Evaluate for other diseases
    - AFB (-) or CXR (-)

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Danger signs: 
- Respiratory rate >30/min, Temp >39 C, Heart rate >120/min & unable to walk unaided
- TB suspect: Patient presenting with cough >2 weeks. For known HIV (+) adults/adolescents, Current cough, Night sweats, Weight loss & fever should prompt TB investigation or Xpert MTB/RIF. For Children living with HIV, poor weight gain, fever, current cough, history of contact with a TB case should prompt an Xpert test

* If HIV positive
**Seriously ill** patient (with danger signs), suspected to have TB!

Immediately refer to higher level facility

HIV(+ve) or Unknown

**HIV** test

IV antibiotics, Consider PCP

**Xpert MTB/RIF** (Regardless of HIV status)

**Baseline AFB!** for treatment monitoring!

;LPA, Culture,!!! &! DST!!!; Refer to MDR!! !treatment site! ;*ART, !CPT!!

Xpert' MTB+'RIF+

; Treat for TB! ;*ART, !CPT!!

Xpert' MTB+RIF>

; Complete! AB!! ;*ART, !CPT!!

Xpert' MTB>RIF>

Improvement! within! 3! days!

TB! unlikely!

Worsening! or! no! improvement! in! 3! days!

; Repeat! Xpert MTB/RIF! ; Investigate! for! EPTB!! ; Consider! empiric! ATT! ;*ART, !CPT!!

For **known HIV (+) adults/adolescents**, Current cough, Night sweats, Weight loss & fever should prompt TB investigation or Xpert MTB/RIF.

For **Children** living with HIV, poor weight gain, fever, current cough, history of contact with a TB case should prompt an Xpert test

* If HIV positive

**Seriously ill** refers to presence of danger signs (Respiratory rate >30/min, Temperature >39 C, Heart rate >120/min, & unable to walk unaided
Proposed sites for additional machines
## Estimated 5 year cost projections

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<tr>
<th>Cost element</th>
<th>Estimated cost US$</th>
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<tbody>
<tr>
<td>Equipment including Xpert machines</td>
<td>214,200</td>
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<tr>
<td>Cartridges</td>
<td>4,419,914</td>
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<tr>
<td>Maintenance (Calibration costs)</td>
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<tr>
<td>Human Resource Development</td>
<td>5,564,280</td>
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<tr>
<td>Quality Assurance</td>
<td>228,574</td>
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<tr>
<td>M &amp; E</td>
<td>190,780</td>
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<tr>
<td>2nd line drugs</td>
<td>14,815,918</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>US$ 25,793,666.00</strong></td>
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Estimated costs incorporated into New TB strategy
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<tr>
<th>Activity</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
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<td>National consensus on Roll-out plan</td>
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<td>Operational feasibility of X-pert roll-out (Total of 14 sites)</td>
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<td>2013</td>
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<td>X-pert roll-out to national scale</td>
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<td>National assessment of impact of X-pert roll out</td>
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Opportunities

• XPRES study
• Political will
• Availability of infrastructure
  – Electricity,
  – Geographic coverage of health facilities,
  – IT network
• Funding opportunities (World Bank)
• Decentralization of ARV services
Anticipated challenges

• Maintenance
• Perceived staff extra workload (POC)
• High operational costs
• Receding partner funding
Next steps

- Refine site selection as informed by site assessments
- Adapt training package for site training
- Update M&E tools to include reporting requirements for Xpert use
- Deploy additional 20 machines from WB as per rollout plan
- Seize opportunity to host regional Xpert MTB RIF implementers’ workshop in July 2013
Thank you