Xpert MTB/RIF Roll Out in Indonesia
Interim Report

Bachti Alisjahbana, Sanne van Kampen, Santo Nugroho, Shinta, Sumanto Simon, Diah E. Mustikawati

TORG Indonesian National TB Program
KNCV / TB CARE I
TB Situation in Indonesia

- 4th Highest TB case load world wide
- ? MDR TB,
- Very few MDR-TB on treatment
- HIV concentrated epidemic
- Very few confirmed TB (~ 4% in HIV cohort)
1. Intensified introduction of Xpert MTB/RIF in 3 selected countries: Nigeria, Vietnam, Indonesia
2. Document lessons learnt and collect evidence for further planning and scaling up of Xpert MTB/RIF

Input
- Xpert machines, 1,700 cartridges
- TA for roll-out in coordination with NTP, incl. site
- Assessments, training, supervision, M&E
- Op. Research Monitoring implementation and collecting evidence for further scale-up of Xpert in collaboration with local research group (TORG)
Operational research objective
Based on the WHO ‘Rapid Implementation’ (March 2011)

Key research question & outcomes

What is the impact of Xpert on programmatic outcomes related to TB & MDR-TB diagnosis and treatment among high risk groups?

Expected key outcomes:
1. Increased TB and MDR-TB case notification
2. Increased TB and MDR-TB treatment initiation
3. Reduction in health system delays
4. Additional yield of Xpert over smear microscopy
5. Reliability of Xpert as marker for MDR-TB
Methodology

- Pre-Post comparative analysis
  - Outcome 1-3: Comparing retrospective to prospective
    - Retrospective: March - August 2011 data (no Xpert)
    - Prospective: March - August 2012 (with Xpert)
    - $\rightarrow$ # diagnosed
    - $\rightarrow$ # starting on treatment

- Comparative analysis
  - Outcomes 4-5: Comparing Xpert with conventional
    - TB HIV: Xpert vs. Ziehl Neelsen
    - MDR TB: xpert vs. Culture (MGIT & LJ)
    - $\rightarrow$ # additional yield by Xpert
    - $\rightarrow$ # sens-spec for MDR detection
Algorithmy of the MDR TB Category

MDR TB suspect (AFB pos)

Xpert Mtb/Rif

Sputum microscopy (morning & spot)

TB Pos (R Sen)

1st line Tx

TB Pos (R Res)

2nd line Tx

Negative/ No TB

Culture M. tuberculosis

M. tuberculosis positive

DST FLD

M. tuberculosis negative
Algorithm of the HIV-TB category

1. HIV Patients
   - Screen for symptoms & history of TB and CXR if available

2. TB Suspect
   - Xpert Mtb/Rif
     - TB Pos (Rif Res)
     - TB Pos (Rif Sen)
   - TB Neg

3. Not Suspect
   - AFB Microscopy
     - TB Pos
     - TB Neg

* Repeated if high clinical suspicion
Sites & period

1. Mikro UI & RSCM (Jakarta)
2. RS Persahabatan (Jakarta)
3. RS Soetomo & BLK (Surabaya)
4. RS Moewardi (Solo)
5. RSHS and BLK (Bandung)

Data gathered from routine registers
Data analysis using stata
Aim for final analysis after in Mar 2013
Results

Prospective data n=1073
- Excluded 117 (reg date, double entries, treatment before test)
- Included in prospective data: n=956
  - MDR-TB Suspect n= 673
  - HIV-TB n= 283

Retrospective data:
Total year 2011 n = 989
Included n=507
**MDR TB suspects:**
number of patient tested and detected R resistant / MDR?

<table>
<thead>
<tr>
<th>Site</th>
<th>Total suspects</th>
<th>Xpert tests done</th>
<th>MTB positive</th>
<th>RIF Resistant (Culture &amp; DST)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>275</td>
<td>226 (82%)</td>
<td>184 (81%)</td>
<td>89 (46%)</td>
</tr>
<tr>
<td>3</td>
<td>151</td>
<td>145 (96%)</td>
<td>112 (77%)</td>
<td>39 (35%)</td>
</tr>
<tr>
<td>4</td>
<td>140</td>
<td>117 (84%)</td>
<td>101 (86%)</td>
<td>46 (46%)</td>
</tr>
<tr>
<td>5</td>
<td>107</td>
<td>102 (95%)</td>
<td>71 (70%)</td>
<td>38 (54%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>673</strong></td>
<td><strong>590 (88%)</strong></td>
<td><strong>468 (79%)</strong></td>
<td><strong>212 (45%)</strong></td>
</tr>
</tbody>
</table>
**MDR TB suspects:**
Does suspect criteria 1,3,6 has higher Rif Resistant?

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Xpert tests done</th>
<th>RIF resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td>With suspect criteria 1,3,6</td>
<td>322</td>
<td>281 (87%)</td>
<td>125 (44%)</td>
</tr>
<tr>
<td>With other suspect criteria</td>
<td>292</td>
<td>256 (88%)</td>
<td>72 (28%)</td>
</tr>
<tr>
<td>All MDR suspects</td>
<td>614</td>
<td>537 (88%)</td>
<td>197 (37%)</td>
</tr>
</tbody>
</table>

Out of 673 MDR-TB suspects, 614 (91%) have a suspect criteria (1-9) appointed to them.
**HIV TB suspects:**
Number of suspect tested by xpert and Rif resistant?

<table>
<thead>
<tr>
<th>Site</th>
<th>Total suspects</th>
<th>Xpert tests done</th>
<th>MTB positive</th>
<th>RIF resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>25 (100%)</td>
<td>3 (12%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>2</td>
<td>127</td>
<td>123 (97%)</td>
<td>36 (29%)</td>
<td>4 (11%)</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>12 (100%)</td>
<td>2 (17%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
<td>35 (90%)</td>
<td>7 (20%)</td>
<td>1 (14%)</td>
</tr>
<tr>
<td>5</td>
<td>80</td>
<td>64 (80%)</td>
<td>12 (19%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td>283</td>
<td>259/283 (92%)</td>
<td>60/259 (23%)</td>
<td>5 (8%)</td>
</tr>
</tbody>
</table>
Outc1: MDR TB case notification
Comparing pre to post Xpert introduction

(R): Retrospective tested with culture
(P): Prospective tested with Xpert and culture
Obj.2: MDR TB treatment initiation
Comparing pre to post Xpert introduction

(R): Retrospective tested with culture
(P): Prospective tested with xpert and culture
Outc.2: MDR TB treatment initiation
Comparing pre to post Xpert introduction

3 PMDT sites

MDR suspects starting MDR treatment

M'11  A'11  M'11  J'11  J'11  A'11  S'11  M'12  A'12  M'12  J'12  J'12  A'12  S'12
Outc.3: MDR TB suspects
Reduction in treatment initiation

<table>
<thead>
<tr>
<th>DAYS</th>
<th>Prior to Xpert introduction</th>
<th>Post Xpert introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Min-Max</td>
</tr>
<tr>
<td>Site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSP</td>
<td>68.3 (n=33)</td>
<td>3-228</td>
</tr>
<tr>
<td>Moewardi</td>
<td>65.3 (n=19)</td>
<td>40-101</td>
</tr>
<tr>
<td>Soetomo</td>
<td>100 (n=28)</td>
<td>3-249</td>
</tr>
<tr>
<td>RSHS</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>78.7 (n=80)</td>
<td></td>
</tr>
</tbody>
</table>
Outc.4: Additional yield of Xpert over smear microscopy in HIV TB suspects
Post Xpert introduction

<table>
<thead>
<tr>
<th>Smear</th>
<th>Xpert</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MTB positive</td>
<td>MTB negative</td>
</tr>
<tr>
<td>Positive</td>
<td>15 (88%)</td>
<td>2 (12%) *</td>
</tr>
<tr>
<td>Negative</td>
<td>9 (8%)</td>
<td>106 (91%)</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>108</td>
</tr>
</tbody>
</table>

* 2 showed MOTT in culture
Outc. 5: Comparing Xpert with culture on detection of MTB

Only suspects included with culture result after Xpert result: +14 days for MGIT / +30 days for LJ. (144 MGIT / 96 LJ cultures)

<table>
<thead>
<tr>
<th>Culture</th>
<th>Xpert MTB positive</th>
<th>MTB negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>168 (70%)</td>
<td>3* (1%)</td>
<td>171</td>
</tr>
<tr>
<td>Negative</td>
<td>43 (18%)</td>
<td>23 (10%)</td>
<td>66</td>
</tr>
<tr>
<td>Non-TB</td>
<td>2 (1%)</td>
<td>1 (0%)</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>213</td>
<td>27</td>
<td>240</td>
</tr>
</tbody>
</table>

* 3 from RSP, all MDR, SS-
Outc.5: Comparing Xpert with C/DST on detection of Rif Resistant / MDR

Only suspects included with culture positive result after Xpert result: +14 days for MGIT / +30 days for LJ. (90 MGIT / 77 LJ)

<table>
<thead>
<tr>
<th>Xpert</th>
<th>C/DST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MDR</td>
</tr>
<tr>
<td>MTB pos. RIF resistant</td>
<td></td>
</tr>
<tr>
<td>89 (53%)</td>
<td>5 (3%)</td>
</tr>
<tr>
<td>MTB pos. RIF susceptible</td>
<td></td>
</tr>
<tr>
<td>11 (6%)</td>
<td>0</td>
</tr>
<tr>
<td>MTB neg.</td>
<td></td>
</tr>
<tr>
<td>3 (2%)</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
</tr>
</tbody>
</table>
Conclusions

- Promising results of Xpert
- High % of MDR TB supports need for rapid diagnosis
- Implication on clinical care?
  - Confirmatory test needs improvement (culture/DST)
  - Hesitation of clinicians
  - Lack of experience and resources
- Expansion?
  - Capacity vs. coverage
THANK YOU

- Indonesian National TB Program
- Lab WG/PMDT/TORG,
- BPPM mikro, WHO, FHI, MSH,
- Coordinating partner: PMU TB CARE I
- Collaborating partners: KNCV, WHO
- Facilitation: TB CARE Country Office
- USAID Jakarta