Social Enterprise Models for Lung Health and Diabetes Screening and Management in 3 Asian Megacities

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Executive Director
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On behalf of UNITAID TBXpert PPM and TB REACH 3 Teams
Dhaka, Jakarta and Karachi
TB REACH and TBXpert Grant Timelines

• 2010 Dec - WHO endorses GeneXpert MTB/RIF
• 2011 Jan - TB REACH 1 Karachi
• 2011 Oct - TB REACH 2 Karachi, Dhaka (Jan 12)
• 2012 Jun - UNITAID TBXpert grant
• 2012 Aug - GeneXpert cartridge price reduction
• 2012 Nov - TB REACH 3 Dhaka, Jakarta, Karachi
• 2013 Q2-Q3 – TB REACH 3 start date
Process and Technology Innovations

Communications
- Local cable TV adverts
- Video Instructions

Mass Screening
- CHW screeners
- Chest X-ray screening

Diagnostics
- Medical Records
- Mapping

Behavioral Economics
- Performance incentives
- Patient lottery prizes
## TB REACH Waves 1, 2 and 3
### Public-Private Mix Experience

<table>
<thead>
<tr>
<th></th>
<th>TBR1</th>
<th>TBR2</th>
<th>TBR3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>City</strong></td>
<td>Karachi</td>
<td>Karachi</td>
<td>Dhaka</td>
<td>Karachi</td>
</tr>
<tr>
<td><strong>Screening Focus</strong></td>
<td>Family</td>
<td>Private</td>
<td>Family</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practitioners</td>
<td>Laboratories</td>
<td>Practitioners</td>
<td></td>
</tr>
<tr>
<td><strong>Months of Activity</strong></td>
<td>27</td>
<td>18</td>
<td>16</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Peak No. of</strong></td>
<td>70</td>
<td>7</td>
<td>4</td>
<td>52*</td>
</tr>
<tr>
<td><strong>Screening Sites</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GeneXpert</strong></td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td><strong>Machines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Population Screened</strong></td>
<td>1,196,772</td>
<td>350,883</td>
<td>200,143</td>
<td>1,886,488</td>
</tr>
<tr>
<td><strong>Suspects Identified</strong></td>
<td>30,763 (2.6%)</td>
<td>8,184 (2.3%)</td>
<td>7,440 (3.7%)</td>
<td>49,389 (2.6%)</td>
</tr>
<tr>
<td><strong>B+ TB</strong></td>
<td>1,838 (6.0%)</td>
<td>975 (11.9%)</td>
<td>575 (7.7%)</td>
<td>3,726 (7.5%)</td>
</tr>
<tr>
<td><strong>B+ per 100,000</strong></td>
<td>154</td>
<td>278</td>
<td>281</td>
<td>198</td>
</tr>
<tr>
<td><strong>All Forms TB</strong></td>
<td>3,312 (10.8%)</td>
<td>1,064 (13.0%)</td>
<td>789 (10.6%)</td>
<td>5,629 (11.4%)</td>
</tr>
</tbody>
</table>

*Maintenance phase. Planned expansion to 200 sites in next quarter.*
TB REACH Waves 1, 2 and 3
Verbal Screening Encounters

- TBR1 - Karachi
- TBR2 - Karachi
- TBR2 - Dhaka
- TBR3 - Karachi
- TBR3 Projections
TB REACH Waves 1, 2 and 3
Bacteriologically Positive TB

- TBR1 - Karachi
- TBR2 - Karachi
- TBR2 - Dhaka
- TBR3 - Karachi
Population-Level Impact of Active Tuberculosis Case Finding in an Asian Megacity

David Dowdy and IRD TB REACH 3 Karachi team
Population-Level Impact of Active Tuberculosis Case Finding in an Asian Megacity

David Dowdy and IRD TB REACH 3 Karachi team

Years of Sustained Intervention

Percent Reduction from Baseline

- Incidence
  - 13%
  - 19%
  - 22%
  - 23%
  - 24%

- Mortality
  - 25%
  - 38%
  - 46%
  - 51%
  - 52%
TBXpert PPM Initiative

UNITAID
Canadian International Development Agency
World Health Organization
Stop TB Partnership
IRD
TB REACH
icddr,b
PT IHI
Community Health Solutions

75 GeneXpert Systems
500,000 cartridges
**TB REACH 3**

**Business Approach**

- **Free**
  - MTB/RIF test
  - Sputum smears
  - TB treatment

- **Not free:**
  - chest X-ray
  - Diabetes
  - spirometry
  - HCV test
  - non-TB medicines
  - O2 and nebulizers
  - CO for smoking cessation

- All profits reinvested into screening, testing and treatment programs

- Spread financial risks across business partners

- Seek private and public investments for expansion
TB REACH 3

Computer Aided Detection 4 TB (CAD4TB)

• Developed by UMC Radboud, marketed by Delft Imaging
• Several individual detection systems for various normal and abnormal structures.
• All individual systems are combined to provide a score of probability of the presence of abnormalities and their relation to active TB.
TB REACH 3
GeneXpert MTB/RIF

• Molecular diagnostics platform
• Single-use disposable cartridges
• Over 25 tests this year including MTB/RIF, MRSA, Flu, CT, Genetic tests for risk of thrombosis,
TB REACH 3
HbA1c Analyzer

- Point of care diagnosis of diabetes
- Result in <10 minutes
- Helps with glycemic control, minimizing further complications
TB REACH 3
Desktop Spirometry

- Point of care diagnosis of COPD and asthma
- Requires skilled technician
Lung Health Information System

Integrated International Standards of Tuberculosis Care Guidelines
TB REACH 3

Case-Finding Activities

FP Clinics

Private Hospitals
Xpert: 3

Scree ning Cente rs
CXR
Xpert: 14

Peripher al NTP Centers

Young Girls
-Life Skills Program

Special ist Clinics

Walk-ins

Public Facilities
Smear, CXR
Xpert=5

Charity Hospitals
Smear, CXR
Xpert=3

Contact Tracing

Privat e Lab
Xpert: 2
TB REACH 3

Screening

- Age, Gender
- Body Mass Index - Height (cm) Weight (Kg)

1. Do you have a cough?
2. For how many weeks have you had the cough?
3. Has a doctor ever said you have diabetes (sugar)?
4. Do any of your parents, siblings or children have diabetes (sugar)?
5. Have you ever taken medicine for high blood pressure on a regular basis?
6. During the past week, how often do you have shortness of breath while resting?
7. During the past week, how often do you have shortness of breath while doing physical activity?
8. Do you experience wheezing?
9. Do you currently smoke tobacco?
10. Has a doctor ever told you that you have HIV?
TB REACH 3
Diagnostic & Treatment Algorithm
Estimated Yields for Year 1 per City

- **3,000,000**
  Verbal Screening Encounters
- **240,000**
  Lung Disease & DM Suspects
- **96,000***
  Chest X-Ray Screen
- **38,400**
  Abnormal X-Ray
- **30,700**
  Xpert Tested
- **4,610**
  B+ TB
- **240**
  RIF Resistant Patients

*Willingness to pay - does not decrease under universal insurance (Jakarta)
## CHW Incentive Structure - Karachi

<table>
<thead>
<tr>
<th>Service</th>
<th>Global Fund</th>
<th>UNITAID</th>
<th>CHS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monthly Stipend</strong></td>
<td></td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td><strong>Transport Allowance</strong></td>
<td>800</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Screening/Referral</strong></td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Plasma Glucose</strong></td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Hemoglobin</strong></td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Chest X-Ray (TB)</strong></td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>HbA1c (Diabetes)</strong></td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Spirometry (COPD/asthma)</strong></td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>HCV or HBV Screen</strong></td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes Care Home Visit</strong></td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>COPD Care Home Visit</strong></td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Asthma Care Home Visit</strong></td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Pneumonia Treatment</strong></td>
<td></td>
<td>200</td>
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</tr>
<tr>
<td><strong>HCV Treatment</strong></td>
<td></td>
<td>600</td>
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</tbody>
</table>

### Bonus Packages
- **Jitna Kaam. Utna Daam.**

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The table above outlines the incentive structure for Community Health Workers (CHWs) in Karachi. The structure includes various services such as monthly stipends, transport allowances, and services related to health screenings, chronic conditions, and care home visits. The incentive amounts vary between different funding sources (Global Fund, UNITAID, and CHS) and are structured to encourage comprehensive health care delivery.
Complementary Grants and Investments
Sustainability Beyond TBXpert and TB REACH

**Grants**
- Center for Health Market Innovations
  - USD 110,000
- GFATM – NTP
  - Smoking cessation in TB
  - USD 100,000
- United Nations Foundation
  - Mother and child health
  - USD 100,000
- Others in discussions

**Investments**
- Social entrepreneurs
  - Life Centers
- Technology entrepreneurs
  - Digital Health Exchange
- Pharmaceutical industry
  - Diabetes
  - Asthma
  - COPD
  - Smoking cessation
  - Hepatitis C therapy
Summary

• Potential to improve standards of lung health and diabetes care in the private sector
• Moderate-risk, high-gain investments in social enterprise models for the private sector have the potential to be sustainable
• Acceptable to NTPs, consortium partners
• Approach based upon experience - TB REACH projects in Karachi and Dhaka