The contribution of research to improving access to health care for TB patients

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The contribution of research - Overview

1. Improved understanding of the concept of poverty

2. Improved understanding of the relationship between poverty and TB

3. Documenting the barriers (hurdles) faced by poor patients accessing TB Services

4. Identifying, piloting, and assessing the impact of ways of overcoming access hurdles

5. Ensuring that the poor are not forgotten in New Tools Research
The concepts of poverty and vulnerability

**Poverty**

- is more than economic poverty (living on ≤US$1 per day)
- encompasses lack of opportunities, voice and representation, and vulnerability to shocks
- is a major determinant of vulnerability to disease – especially TB

**Figure 1.** Factors influencing vulnerability to ill-health

Poverty indicators/area – Lilongwe (Malawi)

Secondary Education
Population % with Secondary Education
- 0 - 6
- 7 - 23
- 25 - 30
- 31 - 47
Pop < 100

Source: 1998 National Census

Private Piped Water
Percentage of Households with Private Piped Water
- 0 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100

Source: 1998 National Census

Poverty indicators/area – Lilongwe (Malawi)

Mitsiriza
Ngwenya

STOP TB Symposium 2009
Poverty indicators/area – Lilongwe (Malawi)

Poverty indicators/area

- **Secondary Education**: Pop < 100
- **Secondary Education**: Pop > 100
- **Secondary Education**: Pop: 100 - 200
- **Secondary Education**: Pop: 200 - 300

Source: 1998 National Census

- **Private Piped Water**: 0 - 20
- **Private Piped Water**: 21 - 40
- **Private Piped Water**: 41 - 60
- **Private Piped Water**: 61 - 80
- **Private Piped Water**: 81 - 100

Source: 1998 National Census

- **Mitsiriza**
- **Ngwenya**

Kilometers: 0 1 2 3 4 5
The relationship between poverty and TB

The poor have

- higher risk of infection
- higher prevalence of disease
- worse outcome of disease

Figure 2. Income poverty and TB

The poor lack:

- Food security
- Income stability
- Access to water, sanitation and health care

Income poverty  \(\Rightarrow\) TB disease

TB may lead to:

- Loss of 20–30% of annual wages among the poor
- Global economic costs: US$ 12 billion annually

Conceptual framework for improved and early case notification/detection

Active TB

Symptoms recognised

Health care utilisation

Diagnosis

Infected

Patient delay

Health system delay

STOP TB Symposium 2009
Economic Hurdles faced by an average rural resident accessing TB treatment in Malawi: 2004-5

Source: Gillian Mann
PhD Thesis
University of Liverpool
2008
Potential effect of adding user-fees in public health system
Costs of TB diagnosis and treatment as a percentage of annual income

*Trop Med Int Health.* 2007;12:1464-1471

![Bar chart comparing perceived and actual TB costs in different regions with DOTS implementation dates: Fujian DOTS since 2002, Henna, Liaoning DOTS since 1992, Xinjiang.](chart.png)
A trial of transferring up-front, out-of-pocket expenditure from patients to TB dispensaries (funded through New Cooperative Medical Scheme in Hunan Province, China)
Categorising Patients

<table>
<thead>
<tr>
<th></th>
<th>3 consecutive smears</th>
<th>2 consecutive smears (high workload and HR constraints)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive</strong></td>
<td>≥+ in at least 2 smears</td>
<td>≥scanty in at least 1 smear (assured QA)</td>
</tr>
<tr>
<td><strong>Negative</strong></td>
<td>0 in at least 3 smears</td>
<td>0 in at least 2 smears</td>
</tr>
<tr>
<td><strong>Indeterminate</strong></td>
<td>Several possibilities eg:- Scanty in 2 smears or less</td>
<td>Or + in less than 2 smears</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 in only one smear</td>
</tr>
</tbody>
</table>
Cuevas L et al submitted

6682 patients
Nigeria
Yemen
Ethiopia
Nepal

Frontloaded

Standard
Figure 3. Sensitivity of the frontloaded and standard schemes when examining 1, 2 or 3 smears. Error bars are 95% confidence interval.
Economic Hurdles faced by an average rural resident accessing TB treatment in Malawi: 2004-5

NB: no user fees in public health facilities

Source:
Gillian Mann
PhD Thesis
University of Liverpool
2008
Potential effect of front-loading of sputum collection for smear microscopy (2 specimens only)
Potential effect of frontloading (2 specimens) with same-day issue of results

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Food</th>
<th>Transport</th>
<th>Drugs</th>
<th>Fees</th>
<th>Total Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal 2nd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public 1st</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public 2nd (1st &amp; 2nd sputum)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public 3rd (no 3rd sputum)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public 4th (get results)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public 5th (start treatment)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Avg monthly income: $7.00
Potential effect of front-loading (2 specimens), same day results and working with informal providers for referral
# A Framework for Impact Assessment for New Diagnostics

<table>
<thead>
<tr>
<th>Layer of Assessment</th>
<th>Kinds of question(s) being answered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 1: EFFICACY ANALYSIS</td>
<td>How well does new tool work in terms of accuracy? How many additional cases will be identified who would otherwise not have been identified? How many additional cases will actually start treatment as a result of using new tool?</td>
</tr>
<tr>
<td>Layer 2: EQUITY ANALYSIS</td>
<td>Who benefits from new tool? (ambulant vs hospitalised, poor/less poor, men/women, adults/children) Why do these benefits accrue? (level health system in which LPAs are deployed, change time to issue of results, change in patient costs)</td>
</tr>
<tr>
<td>Layer 3: HEALTH SYSTEM ANALYSIS</td>
<td>What are the human resource implications of introducing new tool? (training, number and cadre of staff) What are the infrastructure implications? (equipment, lab layout, safety installations) What are the procurement implications? (reagents, consumables, documentation) What are the implications for quality assurance? (internal and external)</td>
</tr>
<tr>
<td>Layer 4: SCALE UP ANALYSIS</td>
<td>What are the projected impacts of going to scale with new tool? eg a) cost savings to patients in relation to income b) cost savings to health providers / the health system d) Effects on transmission of improved infection control as a result of new tool</td>
</tr>
<tr>
<td>Layer 5: POLICY ANALYSIS</td>
<td>What other similar technologies are available or likely to become available? How do similar existing or emerging technologies compare in their projected performance within each of the layers above?</td>
</tr>
</tbody>
</table>
The contribution of research - Conclusions

1. Improved understanding of the concept of poverty

2. Improved understanding of the relationship between poverty and TB

3. Documenting the barriers (hurdles) faced by poor patients accessing TB Services

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5. Ensuring that the poor are not forgotten in New Tools Research
The contribution of research – what next?

1. More commitment from funders for poverty focussed action research (Many thanks to LHL, TDR, DFID, USAID)

2. More engagement of patients and communities in the research process

3. Going to scale with innovations
B. Nhlema-Simwaka et al, IJTLD 2007;11(1):65-71
An example of a quantitative proxy measure

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>P value</th>
<th>Variable description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3.622</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Cooking using firewood*</td>
<td>-0.169</td>
<td>0.006</td>
<td>1 = yes; 0 = no</td>
</tr>
<tr>
<td>Car</td>
<td>0.306</td>
<td>0.000</td>
<td>1 = yes; 0 = no</td>
</tr>
<tr>
<td>Light using electricity</td>
<td>0.263</td>
<td>0.000</td>
<td>1 = yes; 0 = no</td>
</tr>
<tr>
<td>Household size*</td>
<td>-1.439</td>
<td>0.000</td>
<td>Number of people in the household</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.175</td>
<td>0.001</td>
<td>1 = formal employment; 0 = informal</td>
</tr>
<tr>
<td>Sex of head of household</td>
<td>0.135</td>
<td>0.12</td>
<td>1 = male; 0 = female</td>
</tr>
<tr>
<td>Education of head of household</td>
<td>0.127</td>
<td>0.35</td>
<td>Number of years in school</td>
</tr>
</tbody>
</table>

B. Nhlema-Simwaka et al, IJTL 2007;11(1):65-71
An example of a qualitative matrix

Table 3 Qualitative indicators matrix: ranking criteria for poor and non-poor

<table>
<thead>
<tr>
<th>Category</th>
<th>Assets</th>
<th>Livelihood activities</th>
<th>Housing</th>
<th>Food availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>Use communal water</td>
<td>Do ganyu work</td>
<td>Grass thatched house</td>
<td>Do not eat sometimes due to lack of money or food</td>
</tr>
<tr>
<td></td>
<td>Do not have electricity in the households</td>
<td>Contract unskilled</td>
<td>Iron roofed but fewer than two rooms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have a mat for sleeping</td>
<td>Semi-skilled</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Petty trading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-poor</td>
<td>Have piped water</td>
<td>Medium or large scale businesses</td>
<td>Iron roofed house</td>
<td>Eat all times except due to illness</td>
</tr>
<tr>
<td></td>
<td>Have electricity</td>
<td>Employed in private or public</td>
<td>Adequate rooms (2–3)</td>
<td></td>
</tr>
</tbody>
</table>

B. Nhlema-Simwaka et al, IJTL 2007;11(1):65-71