TB Disease Prevalence Survey Pakistan 2010-11

Preliminary Report

Dr Razia Fatima
Epidemiologist/Research coordinator NTP
Pakistan
Overview

Background and rationale

Aims and objective

Survey design, methodology, sample size

Survey organization and management

Preliminary Results
# Background: TB Prevalence survey

<table>
<thead>
<tr>
<th>Year</th>
<th>Survey Type</th>
<th>Sample Size/Cluster</th>
<th>Infection Rate</th>
<th>TB Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-62</td>
<td>First survey</td>
<td>??</td>
<td></td>
<td>4.6%</td>
</tr>
<tr>
<td>1974-78</td>
<td>Second survey</td>
<td>19,335 (125)</td>
<td>13.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>1987-1989</td>
<td>Third survey</td>
<td>40,549 (41)</td>
<td>7.7%</td>
<td>170/100K</td>
</tr>
<tr>
<td>2010-11</td>
<td>Fourth survey</td>
<td>133,000</td>
<td>X</td>
<td>Screening on X-Ray, diagnosis AFB SSM &amp; culture</td>
</tr>
</tbody>
</table>
Background: Notification trend

<table>
<thead>
<tr>
<th>Year</th>
<th>SS+</th>
<th>SS-</th>
<th>EP</th>
<th>TOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2070</td>
<td>7940</td>
<td>2869</td>
<td>2869</td>
</tr>
<tr>
<td>2002</td>
<td>23605</td>
<td>12401</td>
<td>31557</td>
<td>15606</td>
</tr>
<tr>
<td>2003</td>
<td>34550</td>
<td>14862</td>
<td>45936</td>
<td>54278</td>
</tr>
<tr>
<td>2004</td>
<td>45936</td>
<td>19033</td>
<td>68337</td>
<td>83902</td>
</tr>
<tr>
<td>2005</td>
<td>65711</td>
<td>22789</td>
<td>82707</td>
<td>123507</td>
</tr>
<tr>
<td>2006</td>
<td>88747</td>
<td>25797</td>
<td>103629</td>
<td>121343</td>
</tr>
<tr>
<td>2007</td>
<td>106213</td>
<td>33986</td>
<td>112948</td>
<td>154157</td>
</tr>
<tr>
<td>2008</td>
<td>101887</td>
<td>34386</td>
<td>112948</td>
<td>151433</td>
</tr>
<tr>
<td>2009</td>
<td>10435</td>
<td>43416</td>
<td>112948</td>
<td>158203</td>
</tr>
<tr>
<td>2010</td>
<td>267451</td>
<td>45443</td>
<td>112948</td>
<td>219188</td>
</tr>
</tbody>
</table>

Graph showing the increase in notification trend from 2001 to 2010.
Primary Objective

To determine the prevalence of bacteriological confirmed pulmonary tuberculosis among the adult population (≥15 years) in Pakistan during 2010-2011 in a nationwide representative survey.
Survey design, methodology, sample size

Population based cross sectional household survey based on multistage cluster sampling

Sample size and sample size consideration

<table>
<thead>
<tr>
<th>Expected prevalence of Smear positive TB (per 100,000 adult population)</th>
<th>Precision</th>
<th>Effective sample size</th>
<th>Expected # of Smear positive TB cases</th>
<th>Design effect</th>
<th>Total sample size including design effect and participation rate of 85%</th>
</tr>
</thead>
<tbody>
<tr>
<td>213</td>
<td>20%</td>
<td>45,014</td>
<td>96</td>
<td>2.5</td>
<td>132,393</td>
</tr>
</tbody>
</table>
Sampling frame sample size

- **Sampling frame**: A nationwide survey. Only FATA, Dera Bugti and 17 insecure tehsils KP excluded from sampling frame (based on census 1998 this was 6.5% of total population)

- **A sample size** of approximately **133,000** adults (15 years or older)

- **95 clusters** with **1,400** adults per cluster

- 95+5 clusters selected prior to the study
Sampling strategy

Primary sampling Unit

95 Tehsil selected randomly PPS

Secondary sampling unit

One UC randomly selected /Tehsils

Sub sampling of HHs in the selected UC into clusters

One cluster selected (400 HH /cluster)
Suspect identification by symptom screening and Chest X-ray screening

TB case diagnosis by smear, Culture and NAAT
Survey Organization and management

- **Survey central team**
  - Team leader (1)
  - Medical officer (2)
  - Radiographer (2)
  - Lab technicians (2)
  - Logistic assistant (1)
  - LHW (8)
  - FBS (1)

- **Field team-1**
  - National manager (PI)
  - NRL Head
  - Research Coord
  - Finance supervisor

- **Field team-2**

- **Field team-3**

- **Field Team-4**

- **Field Team-5**
  - Survey coordinator
  - Radiology coordinator
  - Data coordinator
  - Logistic coordinator
  - Lab coordinator
  - Data entry Operator (12)

- **Field Team-6**

- **Digital mobile X-ray Field lab**
## Quality Control

<table>
<thead>
<tr>
<th>Activity</th>
<th>QA measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-Ray</td>
<td>Rereading of all abnormal x-ray and 20% of normal x-ray</td>
</tr>
<tr>
<td>AFB microscopy</td>
<td>Rereading of all positive and 10% of negative</td>
</tr>
<tr>
<td>Data management</td>
<td>10% double entry</td>
</tr>
<tr>
<td>DST</td>
<td>Retest all resistant and 10% of susceptible strains</td>
</tr>
</tbody>
</table>
## Survey Monitoring

<table>
<thead>
<tr>
<th>On site survey field monitoring</th>
<th>100% clusters by Central survey team, NTP and PTP Monitors.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTERNATIONAL TA MISSION</strong></td>
<td></td>
</tr>
<tr>
<td>• Epidemiologist (4-Mission)</td>
<td></td>
</tr>
<tr>
<td>• Laboratory expert (2-Mission)</td>
<td></td>
</tr>
<tr>
<td>• Data consultant (5-Mission)</td>
<td></td>
</tr>
<tr>
<td>• PMU-KNCV-Netherland (7-mission)</td>
<td></td>
</tr>
<tr>
<td>Desk monitoring</td>
<td>Daily report by team leader</td>
</tr>
<tr>
<td></td>
<td>Central monitoring on survey participation, suspect identifications and sputum examination</td>
</tr>
</tbody>
</table>
Definition: TB Survey Suspect

Individuals

- Having **cough more than two weeks** &/OR
- Having **abnormal X-ray** shadows.
- Having cough of any duration who for any reason did not have chest X-ray or whose chest X-ray results are not interpretable OR
- Who are **on TB treatment** at time of survey
A *definite survey TB case* (Bacteriologic ally-confirmed survey TB case) is defined as:

- A culture positive TB case with five or more colonies; *OR*
- Culture positive with less than five colonies either with positive smear or abnormal chest X-ray result consistent with TB; *OR*
- Smear positive case with positive nuclear acid amplification test (WHO – endorsed NAAT test)
Definition: Smear +ve survey TB Case

- An AFB-S positive survey TB case (smear-positive TB survey case) is defined as:
  - At least two positive smears; OR
  - One positive smear AND abnormal chest X-ray result consistent with TB (probable TB case); OR
  - One positive smear plus a positive culture (definite TB case).
Eligible population 129,827

Participation:
- Participants: 79.40%
- Non-participants: 20.60%
Gender Breakdown of Participants/Non participants

Pak TB Disease Prevalence Survey 2010-2011
Proportion of participants being suspect (total 11.4%)

**Cough >2wks**

- Male: 6.0%
- Female: 4.0%

**X-ray abnormal**

- Male: 7.0%
- Female: 6.0%
## Confirmed PTB Case in > 15yrs

<table>
<thead>
<tr>
<th></th>
<th>103,387 Participants</th>
<th>Prevalence per 100,000</th>
<th>WHO Estimated Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey Confirmed TB Cases</td>
<td>266</td>
<td>256</td>
<td>364</td>
</tr>
<tr>
<td>95%CI</td>
<td></td>
<td>214-298</td>
<td>154-611</td>
</tr>
</tbody>
</table>
Gender breakdown of prevalence of bacteriologically confirmed cases per 100,000

Male: 330.5
95% CI 262-399

Female: 207.2
95% CI 163-252

Pak TB Disease Prevalence Survey 2010-2011
Age wise breakdown of bacteriological confirmed prevalence per 100,000

- 15-24: 139
- 25-34: 150
- 35-44: 251
- 45-54: 311
- 55-64: 391
- 65+: 1,011

Pak TB Disease Prevalence Survey 2010-2011
Major Challenges

- Floods
- Security situation
- Staff turnover
- Specimen transport in high temperature
- Maintenance of X-Ray equipment
- Huge Data management
Secondary Objective

• To estimate the **prevalence of sputum smear positive pulmonary TB**
• To estimate the **prevalence of TB suspects** as defined by the TB program in the community.
• To study the **health care seeking behaviour of the individuals** with TB suggestive symptoms including delay in seeking care.
• To **compare the asset score**, severity of symptoms, health care seeking behaviour and smear positivity of bacteriological confirmed pulmonary TB cases identified during the survey with smear positive pulmonary TB cases registered in the NTP register 6 months prior to the survey.
• To estimate the **prevalence of first line TB drug resistance** in culture positive pulmonary TB cases identified in the prevalence survey.
Acknowledgements

• USAID
• TB Care 1
• KNCV
• UNION
• WHO EMRO
• FBS
• Provincial TB Programs
• District Health Departments
• Central and Field teams