TB prevalence survey without screening step
Initial screening

- Reduces number of subjects for smear (culture) examination
  - Gives opportunity to field teams to focus attention
  - Provides more time for quality work in laboratory
  - Gives opportunity for tracing subjects
Guidelines

- Advise on having a screening step
  - Symptoms
  - Chest X-ray
  - (Smear)

- Leaves possibility for no screening step
  - Sputum collection all enrolled
    - Smear
    - (Culture)
No screening

- **Advantage**
  - Reduce costs
  - No bulky equipment
    - Easier logistics
    - Less requirements for country’s infrastructure
  - Identifies only the most important population
    - Smear-positive subjects

- **Disadvantage**
  - Large number of sputum samples
  - Strain on laboratory services
  - Prevalence estimate not easy to interpret
Examples and experiences

- Short description of two surveys
  - Eritrea
  - Bangladesh

- Feasibility
  - Sputum collection
  - Laboratory
  - Quality control

- Interpretation of data
  - Saliva versus sputum
  - Smear negative / culture positive
Examples and experiences

- Short description of two surveys
  - Eritrea
  - Bangladesh

- Feasibility
  - Sputum collection
  - Laboratory
  - Quality control

- Interpretation of data
  - Saliva versus sputum
  - Smear negative / culture positive
Eritrea

- 2004-2005
- Included 38,000 in census
- TB prevalence in 19,000 adults
- Budget 193,000 EU (~250,000 US) rate 2004
Case definition Eritrea
Bangladesh

- Ongoing
- Target sample size 50,000 adults
- Budget 80,000 EU (~95,000 US) rate 2006
# Case definition Bangladesh

<table>
<thead>
<tr>
<th>Survey FM 2 samples</th>
<th>Confirm ZN same samples</th>
<th>ZN new sample</th>
<th>Chest X-ray</th>
<th>Case definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Pos</td>
<td>2 Pos</td>
<td>Pos</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td>1 Pos</td>
<td>Pos</td>
<td>Suggestive</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td>Neg</td>
<td>Suggestive</td>
<td>Not Suggestive</td>
<td></td>
<td>No Case</td>
</tr>
<tr>
<td>Neg</td>
<td>Suggestive</td>
<td>Not Suggestive</td>
<td></td>
<td>No Case</td>
</tr>
<tr>
<td>0 Pos</td>
<td>Pos</td>
<td>Suggestive</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td></td>
<td>Pos</td>
<td>Suggestive</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td></td>
<td>Pos</td>
<td>Suggestive</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td></td>
<td>Neg</td>
<td>Not Suggestive</td>
<td></td>
<td>No Case</td>
</tr>
<tr>
<td></td>
<td>Neg</td>
<td>Not Suggestive</td>
<td></td>
<td>No Case</td>
</tr>
<tr>
<td>1 Pos</td>
<td>Pos</td>
<td>Suggestive</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td></td>
<td>Pos</td>
<td>Suggestive</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td></td>
<td>Pos</td>
<td>Suggestive</td>
<td></td>
<td>Case</td>
</tr>
<tr>
<td></td>
<td>Neg</td>
<td>Not Suggestive</td>
<td></td>
<td>No Case</td>
</tr>
<tr>
<td></td>
<td>Neg</td>
<td>Not Suggestive</td>
<td></td>
<td>No Case</td>
</tr>
<tr>
<td>0 Pos</td>
<td></td>
<td></td>
<td></td>
<td>No Case</td>
</tr>
</tbody>
</table>
Examples and experiences

- Short description of two surveys
  - Eritrea
  - Bangladesh

- Feasibility
  - Sputum collection
  - Laboratory
  - Quality control

- Interpretation of data
  - Saliva versus sputum
  - Smear negative / culture positive
Sputum collection

- Large amount of materials
  - Delay of Eritrea study due to order / transport problems
  - Consequences for storage and distribution

- Multiple collection teams needed
  - Will work the full time in the cluster
  - Can not be used for other activities
Main advantage

- All samples can be collected in the field
  - No interruption daily work study subjects
    - In Bangladesh more than willing to field nearby field for short while to meet the field team
Main advantage

- All samples can be collected in the field
  - No interruption daily work study subjects
    - In Bangladesh more than willing to leave nearby field for short period to meet the field team

- Field team around large part of the day
  - Easy to return to household some time later
  - Less chance of a ‘non-inclusion’
    - Eritrea 5% no sputum samples for various reasons; non consent < 1%
    - Bangladesh on the spot oversampling to meet target number of sputum samples
    - Vietnam (has screening) 10% of census not turning up for study procedures and additional 3% of subjects no sputum samples despite tracing
Laboratory and microscopy

- Both have to deal with high workload
  - Can influence quality of work or motivation
  - Try to have rotating duties

- Need adequate number of staff
  - FM microscopy takes place in near darkness
  - Make sure of adequate resting hours
Quality control

- Confirmation procedures
  - Re-examining slides all identified TB patients
  - Re-examining negative slides in subgroup

- Small percentage negative slides in survey without screening is still a lot

- Alternative approaches needed
  - LQAS approach in Bangladesh
    - 2500 slides
    - Needs assumptions on reading quality and acceptable fault rate
Examples and experiences

- Short description of two surveys
  - Eritrea
  - Bangladesh

- Feasibility
  - Sputum collection
  - Laboratory
  - Quality control

- Interpretation of data
  - Saliva versus sputum
  - Smear negative / culture positive
Sputum versus saliva (1)

- In Eritrea, the majority of specimens were classified as saliva (80%)
  - Only on macroscopic characteristics

- Can these specimens be included?
  - Early studies showed up to 50% of smear positive patients having AFBs in saliva
Lik niet aan uw vinger bij het omslaan van de bladzijde.

Bedek uw mond, wanneer gij hoest of niest.
## Saliva Eritrea

<table>
<thead>
<tr>
<th>Type of sample</th>
<th>Appearance of sample</th>
<th>Positive smear</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Spot</td>
<td>Sputum</td>
<td>4 (0.25)</td>
<td>1578 (99.7)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>7 (0.05)</td>
<td>14673 (100.0)</td>
</tr>
<tr>
<td>Morning</td>
<td>Sputum</td>
<td>5 (0.15)</td>
<td>3438 (99.9)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>5 (0.04)</td>
<td>12962 (100.0)</td>
</tr>
<tr>
<td>Type of sample</td>
<td>Appearance of sample</td>
<td>Positive smear</td>
<td>Total (%)</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Spot</td>
<td>Sputum</td>
<td>4 (0.25)</td>
<td>1578 (99.7)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>7 (0.05)</td>
<td>14673 (100.0)</td>
</tr>
<tr>
<td>Morning</td>
<td>Sputum</td>
<td>5 (0.15)</td>
<td>3438 (99.9)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>5 (0.04)</td>
<td>12962 (100.0)</td>
</tr>
<tr>
<td>Type of sample</td>
<td>Appearance of sample</td>
<td>Positive smear</td>
<td>Total (%)</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Spot</td>
<td>Sputum</td>
<td>4 (0.25)</td>
<td>1578 (99.7)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>7 (0.05)</td>
<td>14673 (100.0)</td>
</tr>
<tr>
<td>Morning</td>
<td>Sputum</td>
<td>5 (0.15)</td>
<td>3438 (99.9)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>5 (0.04)</td>
<td>12962 (100.0)</td>
</tr>
<tr>
<td>Type of sample</td>
<td>Appearance of sample</td>
<td>Positive smear</td>
<td>Total (%)</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes (%)</td>
<td>No (%)</td>
</tr>
<tr>
<td>Spot</td>
<td>Sputum</td>
<td>4 (0.25)</td>
<td>1578 (99.7)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>7 (0.05)</td>
<td>14673 (100.0)</td>
</tr>
<tr>
<td>Morning</td>
<td>Sputum</td>
<td>5 (0.15)</td>
<td>3438 (99.9)</td>
</tr>
<tr>
<td></td>
<td>Saliva</td>
<td>5 (0.04)</td>
<td>12962 (100.0)</td>
</tr>
</tbody>
</table>
Sputum versus saliva (2)

- How well is relationship macroscopy and microscopy for identifying saliva?
  - Add-on study in Bangladesh

- Instruct subject correctly for proper sputum
  - If needed repeat the sample collection

- Do not disregard ‘saliva’ samples
Infectious cases (1)

- This strategy gives a prevalence of sputum smear positive cases
  - These are most important infectious cases

- Proportion of bacteriological confirmed cases is smear-negative culture positive
  - Cambodia: 60%
  - Vietnam: 35%
Infectious cases (2)

- Try to get an estimate of smear-negative culture-positive rate
  - In sub-sample of study (Bangladesh)

- This can be used to adjust the prevalence estimates
  - Better information for NTPs
Conclusions

- Prevalence survey with sputum of all
  - Is feasible
  - Needs large study teams and large quantity materials
  - High demands on personnel
  - Needs careful collection of materials
    - Do not discard ‘saliva’ samples
  - Needs careful consideration of QA quantity

- Would benefit from an estimate of smear-negative culture positive rate
IMPORTANT NOTE
Task Force of TB Impact Measurement

- The TF is currently recommending that the strategy of sputum for all with no culture for all should not be used on National TB disease prevalence surveys.

- The currently recommended strategy is the one that uses X-rays and symptom screening procedures followed by sputum and culture for individuals found to be TB suspects (with TB symptoms or abnormal chest X-rays).