TB Disease Prevalence Survey - Overview and Introduction of the TF

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Global Task Force on TB Impact Measurement (since June 2006) -Mandate-

• To produce a robust, rigorous and widely-endorsed assessment of whether the 2015 targets for reductions in TB incidence, prevalence and mortality are achieved at global level, for each WHO Region and in individual countries

• To regularly report on progress towards these targets in the years leading up to 2015

• To strengthen national capacity in monitoring and evaluation of TB control
3 strategic areas of work

- **Strengthening surveillance** - use of routine surveillance data to measure incidence, prevalence and mortality
  - all countries
  - ultimate goal to measure cases and deaths directly from notification and vital registration data

- **Prevalence of TB disease surveys** in ≥ 21 global focus countries

- **Periodic review and revision of methods** used to translate data from surveillance systems and surveys into estimates of disease burden
TB Prevalence survey

- TB prevalence is an MDG indicator that can be directly measured

- Estimation of TB burden using tuberculin surveys no longer applicable in most settings

- Funding is available for surveys, and governments and international agencies recognize importance of measuring impact
Why country wants TB prevalence Survey

Why we want country to do TB prevalence Survey
TB Prevalence survey

- To know TB burden in a country
- To measure the change/impact

(new)
- To know limitation of the current programme to improve the programme/ to revise the strategy
Recent National Surveys with CXR screening and culture with Notification Data by routine surveillance

<table>
<thead>
<tr>
<th>/100,000</th>
<th>Notification rate</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S+ New</td>
<td>All TB</td>
</tr>
<tr>
<td>Cambodia 2002</td>
<td>125</td>
<td>178</td>
</tr>
<tr>
<td>Philippines 2007</td>
<td>98</td>
<td>160</td>
</tr>
<tr>
<td>Viet Nam 2007</td>
<td>62</td>
<td>111</td>
</tr>
<tr>
<td>Myanmar 2009</td>
<td>83</td>
<td>257</td>
</tr>
</tbody>
</table>

Conservative point estimates assuming that there is no bacteriologically+ case in children.
Countries where surveys are recommended
(Approved by Task Force Meeting, Dec 2007)

21 global focus countries
36 additional countries that met basic criteria

Note: Ethiopia was added to the global focus countries in 2009
Global Task Force

- Set a global guidance for standardization
- Assist Countries
  - Preparation & in-country sensitization
  - Workshops: Study design & Budgeting
  - Protocol Review
  - Coordination of Technical Assistance
  - Survey Operation Review
  - Analysis
  - Certificate the study
- Training (Survey managers, Consultants)
- Provide data for Re-estimation of TB Burden
- Advocacy & Fund raising
Good Progress in Asia

- China: 1990-2000- **2010: completed**
- Cambodia: 2002-2010/11: **ongoing**
- Viet Nam: 2007-(2012/13)
- (Malaysia: 2003)
- Indonesia: 2004- (2013/14)
- Bangladesh: 2008- before 2015?
- Pakistan: 1987- 2010/11: **ongoing**
- (Laos: **2010/11: ongoing**)
No survey in Africa started yet since 2007 meeting – urgent action required!!

(STB Department meeting, 15 September 2010)
Ethiopia Launched National TB Prevalence Survey
Global progress, prevalence surveys

21 Global Focus countries identified by Task Force

- Cambodia
- Malaysia
- Indonesia
- Eritrea
- Thailand
- Philippines
- Bangladesh
- Myanmar
- Cambodia
- Ghana
- Kenya
- The Gambia
- Viet Nam
- China
- Nigeria
- Malawi
- Indonesia
- Pakistan
- Lao PDR
- Ethiopia
- Rwanda
- S. Africa
- Tanzania
- Uganda
- Thailand
- Viet Nam
- Philippines
- Nepal
- Mozambique
- S. Africa

Number of surveys:
- Asia
- Africa
- Non Global Focus country
See Update Sheet

• Regular update
• Global Focus countries
• Other countries including temporal consultations
WHO is learning from countries

Re-estimation of TB Burden

- Prevalence of Sm+ TB in Cambodia, 2002, was half of previous estimate and previous study results

- Prevalence of S+ in Yangon, Myanmar, nearly 3 times previous national estimate -> National Survey

- Prevalence of S+ in Viet Nam, 2007, was 60% more than previous estimate
  - Viet Nam & Philippines: S+ prevalence is a double of notification

→ Quality Prevalence Surveys can help to revise and improve estimates of disease burden
Task Force
Major recommendations
How should surveys be implemented?

Follow the guidelines!

Assessing TB prevalence through population-based surveys

7000 copies Sold OUT
2nd edition of Handbook – to be launched in Berlin, 15 November

Major collaborative effort January–November 2010

46 authors

Multiple agencies/universities/research institutes and NTPs

Funding from USAID, DGIS, Japan
Objectives

The major objectives that could be set for a prevalence survey can be defined as follows:

To measure the prevalence of bacteriologically-confirmed pulmonary TB, among the adult population;

To identify the extent to which people with TB or those with symptoms suggestive of pulmonary TB have already sought care from health-care providers, and if so with which types of care provider;

To identify reasons for lack of contact with services provided by, or in collaboration with, the NTP;
Objectives (2)

To update all population estimates of disease burden (incidence, prevalence, mortality) using results from the prevalence survey in combination with in-depth assessment of surveillance and programmatic data and other survey data;

To assess whether the burden of disease caused by TB has fallen since the last survey;

To provide a baseline for future measurement of trends in the burden of disease caused by TB.
Quality indicators

• Study coverage (exclusion due to insecurity…)
• Eligibility
• Participation (screening)
• Eligible for further examinations (lab)
• Sputum collection
• Examination process (recovery, contamination …)
• Data entry (missing values; should be corrected)
A carefully designed survey can tell you lots more than TB prevalence

- Changes in TB burden and re-estimation of burden
- Performance of strategies for screening of TB suspects
- Health-seeking behaviour of TB patients and individuals reporting chest symptoms
- Where and why are cases missed by the NTP e.g. access to care, role of private sector
- Risk factors
Interviews

Which interviews you will carry out, or all?

• S/E question during the census:
• Screening interview to all the participants: 100%
• In depth interview to TB symptomatics: 5%
• In depth interview to TB on Tx: <100
• In depth interview to detected TB patients: 100-300 (with contact investigation to children)
Where are cases being missed?

Yangon survey, 2006: 1/3 of TB patients being treated by GPs

64 participants were on TB treatment

- 33 in NTP: around 130/100,000 = 260/100,000/year

34% in NTP
52% in GP
9% in Other
5% in Unknown

33 in NTP: around 130/100,000 = 260/100,000/year
Sampling

- Population proportionate cluster samplings
- Stratification (e.g. geographical areas or urban/rural)
  
  For sampling efficiency

  Not pursuing prevalence of subset population

- Smaller cluster size: <1,000 (500-700)/cluster
- Prevalence Assumption: WHO estimate (Conservative side) or estimate from sub-national/previous studies

- Relative precision: 20-25%
- Design (Cluster) effect: 1.5 – 2.0 or more
- Minimum Participation rate: => 85%
Bacteriological confirmation of M TB by culture or NAA test

Consider lower positive predictive values in community survey: false positive -> also ethical concern. Two evidences to define survey confirmed cases
WORLD TB DAY 2008

I AM Stopping TB
You can stop TB. Join us.
www.stoptb.org

( WHO headquarters, March 2008)
Recommended screening strategy

Do smear and culture at least for with TB symptoms and/or abnormal chest X-ray
Why Chest Radiogram and Culture are important
Recent National Surveys with CXR screening and culture with Notification Data by routine surveillance

<table>
<thead>
<tr>
<th>Country</th>
<th>2002</th>
<th>2007</th>
<th>2007</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence</td>
<td>125</td>
<td>178</td>
<td>269</td>
<td>898</td>
</tr>
<tr>
<td>Notification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rate</td>
<td>S+ New</td>
<td>All TB</td>
<td>SS+</td>
<td>Bac+ Pul.</td>
</tr>
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<td></td>
</tr>
<tr>
<td>Bac+ Pul.</td>
<td>898</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conservative point estimates assuming that there is no bacteriologically+ case in children.
SS+ Prevalence is more than a double of notification after the years of efforts of DOTS

Bac+ prevalence is more than a double of SS+ prevalence

• Because our efforts were not enough
  – Hot spots exist: Urban slum, Very remote, Ethnic Group

  AND/OR

• Because of Limitation of Case finding strategies
Strategies for screening TB suspects

40-60% of confirmed cases in surveys do not have chronic cough

<table>
<thead>
<tr>
<th></th>
<th>No Chronic Cough</th>
<th></th>
<th>No symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S+</td>
<td>Bac +</td>
<td>Bac +</td>
</tr>
<tr>
<td>Cambodia</td>
<td>38%</td>
<td>61%</td>
<td>15%</td>
</tr>
<tr>
<td>Zambia</td>
<td></td>
<td>57%</td>
<td>10%</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>40%</td>
<td>45%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Proportion of "asymptomatic" cases
National TB surveys in China

<table>
<thead>
<tr>
<th></th>
<th>2010 survey</th>
<th>2000 survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smear Positive</td>
<td>26.3%</td>
<td>6.7%</td>
</tr>
<tr>
<td>All Pulmonary</td>
<td>43.0%</td>
<td>14.2%</td>
</tr>
</tbody>
</table>

(Preliminary Results: Dr S Jiang CDC/NTP China)
<table>
<thead>
<tr>
<th>Condition</th>
<th>Among Participants</th>
<th>Proportion in SS+ subjects</th>
<th>Proportion in Bac +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic cough (2w)</td>
<td>4%</td>
<td>41%</td>
<td>25%</td>
</tr>
<tr>
<td>Cough any duration</td>
<td>24%</td>
<td>72%</td>
<td>51%</td>
</tr>
<tr>
<td>Any symptom</td>
<td>37%</td>
<td>79%</td>
<td>62%</td>
</tr>
<tr>
<td>CXR TB susp</td>
<td>5%</td>
<td>79%</td>
<td>73%</td>
</tr>
<tr>
<td>CXR any abnormality in lung</td>
<td>12%</td>
<td>95%</td>
<td>92%</td>
</tr>
</tbody>
</table>
National TB Prevalence Survey in ASEAN countries  
(Surveys with CXR and Culture)

<table>
<thead>
<tr>
<th>Survey Year</th>
<th>Age</th>
<th>Smear Positive</th>
<th>Bac Confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>2002 10y-</td>
<td>362 (284-461)</td>
<td>1208 (997-1483)</td>
</tr>
<tr>
<td>Philippines</td>
<td>2007 10y-</td>
<td>260 (170-360)</td>
<td>660 (510-810)</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>2007 15y-</td>
<td>197 (149-254)</td>
<td>307 (248-367)*</td>
</tr>
<tr>
<td>Myanmar</td>
<td>2009 15y-</td>
<td>242 (186-315)</td>
<td>613 (502-748)</td>
</tr>
</tbody>
</table>

*Possible explanations of lower prevalence of Bac confirmed cases in Viet Nam: Viet Nam survey used "TB suspect" as screening criteria of CXR while others used "any abnormality in lung". Only one culture per each eligible was performed in Viet Nam while other surveys had two or three cultures.
60% of culture confirmed cases are smear negative = unable to detect by LED FL microscopy

Myanmar National Survey: Preliminary Analysis (NTP Dec 2010)
Smear microscopy alone misses $>50\%$ of bacteriologically-confirmed TB

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<th>S+/Bac+</th>
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<td>Philippines</td>
<td>2007</td>
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<tr>
<td>Korea</td>
<td>1995</td>
</tr>
<tr>
<td>Africa*</td>
<td>01-05</td>
</tr>
</tbody>
</table>

*Africa 5 sub-national surveys average
Preparation

- Political commitment,
- Core group formation
- Financing
- Study Protocol Development
- Scientific and Ethical review
- Implementing agency
- Recruitment and Team development
- SOPs
- Training
- Pilot Survey
Requirements in Preparation Stage
Requirements (1) Chapter 2

• Strong commitment and leadership from the NTP/Ministry of Health and a core group of professionals;
• Identification of a suitable institute, organization or agency to lead and manage survey implementation;
• Adequate laboratory capacity;
• Pre-Approval of survey methods for chest X-ray screening by the National Radiation Authority;
Requirements (2)

• Reliable and timely support for procurement and logistics;
• Funding;
• Field security;
• Community participation;
• Clearance of survey protocols by national and international review boards; and
• The availability of external support and technical assistance.
We also need

• Full time survey coordinator or project leader in early stage of the preparation

• Leading technical assistance agency or consultant
Additionally

• Workshop by WHO and partners

• Practical experiences from countries where the survey was already conducted
  – A-A Collaborations