TB Disease Prevalence Survey
- Overview, why and how

Ikushi Onozaki MD, MPH
Team Leader, TB Prevalence Survey
WHO Global Task Force on TB Impact Measurement
Stop TB Department, WHO
onozakii@who.int
3 strategic areas of work of the Task Force

- **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- Estimation of TB disease burden using tuberculin surveys (standard method in 1990 estimate by WB and WHO) no longer applicable

- Funding is available for surveys, and governments and international agencies recognize importance of measuring impact
Why TB Prevalence survey

- Country – Eager to know real situation of TB in community
  - If over-estimate: can't escape from criticism that your efforts are not enough
  - If under-estimate: No additional investment after achieving the targets - > TB can't be controlled; patients get the problem

- Donors and global community – Eager to know the impact of efforts on TB epidemiology
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
What we are measuring

- Prevalence of Bacteriologically Confirmed Pulmonary TB disease among adult population in community
  - Often aged 15 years old or more

As TB is a "rare" disease, a sample size of 30,000-60,000 is often necessary to have a good estimate
(will be discussed by Babis)
Recent National Surveys with CXR screening and culture with Notification Data by routine surveillance

<table>
<thead>
<tr>
<th></th>
<th>/100,000</th>
<th>Notification rate</th>
<th>Prevalence</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S+ New</td>
<td>All TB</td>
</tr>
<tr>
<td>Cambodia 2002</td>
<td>125</td>
<td>178</td>
<td>269</td>
</tr>
<tr>
<td>Philippines 2007</td>
<td>98</td>
<td>160</td>
<td>200</td>
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<tr>
<td>Viet Nam 2007</td>
<td>62</td>
<td>111</td>
<td>145</td>
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<tr>
<td>Myanmar 2009</td>
<td>83</td>
<td>257</td>
<td>170</td>
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Conservative point estimates assuming that there is no bacteriologically+ case in children
Limitations

- TB incidence can't be estimated directly from prevalence
- Hard to estimate the TB burden in Children and the burden of Extrapulmonary TB by a community survey
- Sub-national estimations more than a few strata require a huge sample size
- A survey is costly and labour intensive
- Under/Over estimation due to limitations in screening and diagnostic tools
Where we recommend a survey

- Unclear TB burden and trend from surveillance data (unreliable or incomplete surveillance)
  - High TB prevalence
  - High TB/HIV prevalence
  - Previous study to compare

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- TB service to cope with the findings
- Willingness of Country

Mostly countries approached us to consult or proposed survey without consultation
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
  - Feasibility assessment
  - 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
- Global Advocacy & Fund raising
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 from the early stage of the preparation

- Leading technical assistance agency or consultant
Current status of survey implementation
Good Progress in Asia

- China: 1990-2000-2010 **Completed**
- Cambodia: 2002-2011 **Ongoing**
- Viet Nam: 2007-(2013/14)
- Indonesia: 2004- (2013/14)
- Bangladesh: 2008- (by 2015)
- Myanmar: 1994-2009/10 **Completed**
- Pakistan: 1987- 2011 **Ongoing**

- Malaysia: 2003
- 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

Number of surveys

Asia

Africa

Non Global Focus country

Cambodia Malaysia Indonesia Eritrea Thailand Philippines Bangladesh Myanmar Cambodia Ghana Kenya The Gambia

Task Force
Major recommendations
How should surveys be implemented?

Follow the guidelines!

7000 copies Sold OUT

Major collaborative effort
January–November 2010

46 authors

Multiple agencies/universities/research institutes and NTPs

Funding from USAID, DGIS, Japan

You got first copies today
Sample size and 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 (k= 0.4-0.6)
- Minimum Participation rate: => 85%
How to select households/individuals within a selected sampling unit

- Random sampling of individuals or households is often not feasible

- Often unclear in most protocols
  - Starting from the centre may have a potential bias

- Need clear SOP and guidance
Recommended screening strategy

Do smear and **culture** at least for with TB symptoms and/or abnormal **chest X-ray**
(WHO headquarters, March 2008)
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)
Complexity of data management

FROM SOP of CAMBOIDA SURVEY 2011
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
Why Chest Radiogram and Culture are important
Recent National Surveys with CXR screening and culture with Notification Data by routine surveillance

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## Strategies for screening TB suspects

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

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<th>No symptom</th>
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<td>S+</td>
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<td>Cambodia</td>
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<td>38%</td>
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<td>Viet Nam</td>
<td></td>
<td>40%</td>
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<table>
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<tr>
<th>Condition</th>
<th>Among Participants</th>
<th>Proportion in SS+ subjects</th>
<th>Proportion in Bac +</th>
</tr>
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<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>
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Bottlenecks of the operation

- CXR and Interview $\rightarrow$ 150-200/day (-300)
- If 10-15% need to submit specimens
  $\rightarrow$ 15-30 persons/day $=$ 30-60 specimens/day
- If there is a transportation every two days
  $\rightarrow$ 60-120 specimens/
- If 3 clusters operate at one time
  $\rightarrow$ Lab will receive 200-300 specimens in a day

Careful planning is essential