TB Disease Prevalence Survey
-Lessons from Cambodia survey-

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### TB in Cambodia

**WHO Estimates for 2001**

<table>
<thead>
<tr>
<th>estimate</th>
<th>number</th>
<th>rate/100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>incidence (all)</td>
<td>75,000</td>
<td>573</td>
</tr>
<tr>
<td>incidence HIV+</td>
<td>9,200</td>
<td>70</td>
</tr>
<tr>
<td>incidence (ss+)</td>
<td>34,000</td>
<td>256</td>
</tr>
<tr>
<td>prevalence (all)</td>
<td>178,000</td>
<td>1356</td>
</tr>
<tr>
<td>prevalence (ss+)</td>
<td>72,000</td>
<td>548</td>
</tr>
<tr>
<td>deaths</td>
<td>16,000</td>
<td>121</td>
</tr>
</tbody>
</table>
Motivations & Challenges
(stated in 2000)

• Though we have been making efforts to expand DOTS for 7 years since 1994, detecting >100/100,000 S+ cases/year with a cure rate of >85%, Geneva has been giving us larger incidence year by year.

• Although there was significant improve in reporting, case notification/registration is not always reliable.

• We may not have as many MDR cases as reported in the Global Report.

• No body knows nationwide impact of HIV on TB.

• We want to expand DOTS to health centers and community. It is is essential to know base line situation.
Objectives

• 1) BCG scar rate and prevalence of TB infection in aged below 15
• 2) Prevalence of TB disease among those aged 10 or above
  S+ and C+ TB, and TB suggestive by X-ray
• 3) Prevalence of TB related symptoms and behaviours towards symptoms
• 4) Behaviours of TB patients
National TB Prevalence Survey

1\textsuperscript{st} Systematic, National Representative and Comprehensive TB Survey in Cambodia

- First population based survey under a typical DOTS program
- 42 clusters of 31,000 people across the country
  - 30,000, 97\%, participated
  - 22,000, 96\%, Age 10 or more

\textbf{Aged} <15 y : Tuberculin survey
\textbf{Aged} 10 or more: Disease survey
Where we operated:

Four population scarce north east provinces were excluded due to difficulty in logistics

Survey Cluster: ★
Sample size

- Prevalence: 483/100,000 (WHO estimation for all population, conservatively taken as prevalence among aged 10y or more)
- $\alpha = 0.95$
- $d = 25\%$
- minimum participation rate = 75\%
- Design effect = 1.25
- Proportion of Children under aged 10y: 28\%
- 29,303 people including children are necessary
29,303

- Averaged size of village: 834 p
- Weekly cycle of operation (3-4 days for X-ray): 150/ day was considered for feasible operation
- Size of a cluster = 720 p (500-550 aged 10y or more)
- 29,303/ 720 = 41
- Rural population 84%
- Cluster distribution: 35 Rural, 7 Urban (42)
Sampling methods

• Clusters
• Population proportionate sampling of urban and rural districts and random sampling of basic administrative units (village, ward)

• Eligibility
  – Actual population who basically live/stay in the designated area for one month or more
  – Excluding military camp, diplomat compound
Survey operation schedule

- 1\textsuperscript{st} cluster visit (planning stage)
- 2\textsuperscript{nd} cluster visit (3-4 weeks before)
- Survey week
- Mon: Census
- Tue: Screening and Sputum collection, Tu injection
- Wed: ditto
- Thu: Screening and Sputum collection (1\textsuperscript{st} batch transportation)
- Fri: Absentee tracing, Screening and Sputum collection and Tu reading
- Sat morning: Tu reading & Last sputum collection
- Wrap up and report to local authority
1st Pre-visit (Preparation stage)

Logistics to the cluster

Survey site mapping, basic population data

Local collaboration etc
2\textsuperscript{nd} Pre-Visit
(3-4w before)
precise local plan
pre census population data
date confirmation
designating area
arrange staff/volunteer
Census: Confirming eligible population and asking for participation

People who basically stay in a defined area more than a month are eligible population regardless the possession of their house and their availability on the survey day.

Proper informed consent to avoid creating fears

Socio economic data collection may be done in this stage
Screening methods

Indirect methods: Taking sputum from “TB suspects”

– Symptom screening (Indonesia, Bangladesh) by Interview
  and/or
– Modern MMR (Korea, Japan, Viet Nam)
– Fluoroscopy (China 1st survey)

– Conventional X-ray with automatic processor
  (Philippines, Cambodia, Myanmar)

Digital X-ray (Viet Nam)
Individual or family by family interview by health professional from Central unit

- TB related symptoms
  - Duration of sickness
- TB history
  - Possible treatment
  - Consultation Places
X-ray Car
Or
Portable Equipment
Developing Film on the Spot
Quality Direct X-ray is Available in Villages

that contributed to high participation rates and 100% sputum collection from suspects
Lab work

Smear Microscopy
Direct Smear, ZN

Culture
Every step in reference lab
Central Works

• Lab: (Smear), Culture & Identification, (DST)
• X ray: Central reading
• Data entry and analysis
• Quality assurance activities
• Etc
<table>
<thead>
<tr>
<th>Type</th>
<th>Age 10-</th>
<th>95% C.I.</th>
<th>All ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>S(+)</td>
<td>362</td>
<td>284-461</td>
<td>269*(New 236)</td>
</tr>
<tr>
<td>S(-)C(+)</td>
<td>846</td>
<td>675-1059</td>
<td>&gt;628</td>
</tr>
<tr>
<td>X-ray(+)</td>
<td>1,370</td>
<td>1003-1661</td>
<td>&gt;1,018</td>
</tr>
<tr>
<td>Bac(+)</td>
<td>1,208</td>
<td>997-1463</td>
<td>&gt;897</td>
</tr>
<tr>
<td>Active</td>
<td>2,579</td>
<td>2205-3013</td>
<td>&gt;1,916</td>
</tr>
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*Assuming that there was no S+ case in children age less than 10
Number of S(+) cases actually detected and Prevalence Rate
S(+) prevalence rates (aged 10y or more) -comparison with old studies-

National Prev. Survey 2002
Prevalence Rates of bacteriologically confirmed TB (/100,000)

<table>
<thead>
<tr>
<th>Age</th>
<th>S(+)</th>
<th>Bac(+)</th>
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</thead>
<tbody>
<tr>
<td>10-14</td>
<td>64</td>
<td>86</td>
</tr>
<tr>
<td>15-24</td>
<td>130</td>
<td>316</td>
</tr>
<tr>
<td>25-34</td>
<td>301</td>
<td>921</td>
</tr>
<tr>
<td>35-44</td>
<td>468</td>
<td>1487</td>
</tr>
<tr>
<td>45-54</td>
<td>640</td>
<td>2074</td>
</tr>
<tr>
<td>55-64</td>
<td>814</td>
<td>3456</td>
</tr>
<tr>
<td>65-</td>
<td>1512</td>
<td>5944</td>
</tr>
</tbody>
</table>
Survey in Yangon, 2006
5.63% of the participants had TB Tx history

1,059/18,809
Current TB treatment

64 participants were on TB treatment

33 in NTP: around $\frac{130}{100,000} = \frac{260}{100,000}$/year
Components neglected/not sufficient in the original plan/budget in Cambodia

- Quality assurance
- Security arrangement
- IEC including those to obtain informed consent
- Treatment/DOT after the survey especially in remote clusters with limited access to DOTS
- Data management
- Dissemination
Now, we’ve got a better view, not only with prevalence figures but also with lots of additional information from the survey.

The survey has contributed to establishing better service based on scientific evidences.