TB National Survey in Indonesia

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Where is Indonesia?

Indonesia is located in the South East Asian Archipelago and bordered by the nations of Malaysia, Singapore, Philippines, and Papua New Guinea. Indonesia is a nation of islands consisting of almost 13,000 islands, around 6,000 islands are populated with a population of over 210 million. Indonesia is the world's largest archipelagic nation.
TB Related National Survey

- TB Prevalence Survey 2004
- Basic Health Research 2007
- Basic Health Research 2010
- TB Prevalence Survey 2012 (planning)
TB Prevalence Survey 2004
Survey Design

- Piggy backed to National Socio-Economic Survey (250,000 HHs)
- Two-stage cluster stratified sampling design (stratified by urban/rural area)
- Census block as PSU (select by PPS) and Household as SSU (16 HHs per CB)
- Sample size of 58,000 adults (20,000 HHs) covered 30 provinces
- National and regional level of estimation
Sampling Design

Population → Sampling frame of census block →

NSES-Core Samples (15,625 CBs or 250,000 HHs) →

NSES-Module Samples (4,200 CBs or 67,000 HHs) →

TB Prevalence Survey (1,250 CBs or 20,000 HHs) →

Select 16 HHs per CB systematically
Suspect Definition

- Person who had a productive cough, yielding sputum and/or blood, of any duration at any time during the preceding month
Case definition of smear-positive pulmonary TB case

- At least 2 (out of 3, i.e., spot, morning, spot when collect morning sputum) sputum specimens smear-positive for acid-fast bacilli by microscopy
Finding suspects and sputum collection

1. Start
   - Visit 1250 CBs and sampled 20,000 HHs
   - Screening interview to find TB suspects for all HH member aged 15yr or older

2. Yes
   - Next HH/CB?

3. No
   - Find suspects?
     - Yes
       - Collect sputum (3 times)
       - Culture (45% of samples) and microscopic examination
     - No
       - Stop
Sample size

<table>
<thead>
<tr>
<th>Type</th>
<th>Plan</th>
<th>Visited/inter viewed</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household</td>
<td>20,000 HHs</td>
<td>18,387 HHs</td>
<td>92.0%</td>
</tr>
<tr>
<td>KAP respondent</td>
<td>20,000 HHs</td>
<td>17,887 HHs</td>
<td>89.4%</td>
</tr>
<tr>
<td>HH members &lt;15yrs</td>
<td>26,335</td>
<td>22,551</td>
<td>85.6%</td>
</tr>
<tr>
<td>HH members 15yrs+</td>
<td>57,818</td>
<td>50,154</td>
<td>86.7%</td>
</tr>
</tbody>
</table>
TB Prevalence Survey 2012
Survey Design

- Two-stage cluster stratified sampling design (stratified by region, i.e., Sumatera, Java-Bali, and Others)

- Village as PSU (select by PPS) and group of CB as SSU (1 group of CB per village and 500 adults per group of CB)

- Sample size of 78,000 adults (156 clusters) covered 33 provinces

- National and regional level of estimation
**Sample Size**

- Estimate of TB prevalence per 100,000 ($p$) based on WHO estimates: 156
- $Deff = 1.5$
- Cluster size ($M$) = 500
- Precision ($d$) = 20%
- Response rate ($r$) = 85%
- Calculated sample size:
  - Adults = 78,000
  - Clusters = 156
Sampling Design

Population -> Sampling frame of village (>70,000)

Select 156 villages by PPS sampling, stratified by region

Develop sampling frame of cluster (group of CBs)

Select 1 cluster per selected village by PPS sampling

1 cluster consists about 500 adults
Suspect Definition

- Person who had a productive cough for at least two weeks and/or an abnormal chest X-ray
Case definition of smear-positive pulmonary TB case

- 2 sputum specimens smear-positive for acid-fast bacilli by microscopy, or

- At least 1 sputum specimen smear-positive for acid-fast bacilli by microscope, radiographic abnormalities consistent with pulmonary TB, and a decision of a physician to treat with the full course of chemotherapy, or

- At least 1 sputum specimen smear-positive for acid-fast bacilli by microscope and at least 1 sputum specimen that is culture positive for *M. tuberculosis*
Finding suspects and sputum collection

Start

Eligible adults visit the center

Symptom screening interview

Chest X-ray

Has a symptom and/or abnormal CXR?

No

Stop

Yes

Collect sputum (2 times)

Culture and microscopic examination
## Comparison of 2004 and 2012

<table>
<thead>
<tr>
<th>Topic</th>
<th>2004</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey design</td>
<td>Piggy back survey of NSES</td>
<td>Its own survey</td>
</tr>
<tr>
<td>Sampling design</td>
<td>PSU: CB</td>
<td>PSU: Village</td>
</tr>
<tr>
<td></td>
<td>SSU: HH</td>
<td>SSU: Cluster</td>
</tr>
<tr>
<td>Stratification</td>
<td>Urban/rural area</td>
<td>Sumatera, Java-Bali, Other</td>
</tr>
<tr>
<td>Sample size</td>
<td>16 HHs/CB</td>
<td>500 adults/cluster</td>
</tr>
<tr>
<td></td>
<td>50,000 adults</td>
<td>78,000 adults</td>
</tr>
</tbody>
</table>
## Comparison of 2004 and 2012

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<tr>
<th>Topic</th>
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<th>2012</th>
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<tbody>
<tr>
<td>Screening</td>
<td>Symptom interview</td>
<td>Symptom interview and CXR</td>
</tr>
<tr>
<td>Case definition</td>
<td>Smear</td>
<td>Smear, culture, and CXR</td>
</tr>
<tr>
<td>Data collection</td>
<td>Survey team visits HH</td>
<td>Eligible adults visit the center</td>
</tr>
</tbody>
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Estimate TB prevalence of 2004 and 2012

- If different, it may due to difference of
  - Survey design and sampling strategy, including the sample size
  - Screening method
  - Case definition
  - Data collection procedure

- Need to have techniques to adjust the differences when comparison or trend analysis is necessary (?)
Thank you