Lesson learnt from

National TB Prevalence Survey in Cambodia, 2002

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Meeting on prevalence survey in African countries
World Health Organization, Geneva, Switzerland, 15-16 October 2009
1-Background information

- Cambodia is located in Southeast Asia with 180.035 sq.km and 13 million population at that time.

- It has been designed by WHO as one of the 22 burden countries of TB.

- The incidence rate estimated by WHO in 2001 was 573/100,000
Practical point on survey preparation in Cambodia
Where we operated:

![Map of Southeast Asia showing countries like Thailand, Lao, and Viet Nam with red stars indicating surveyed locations.]

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

Survey Cluster: ★
In May 2001 the organization of National TB Prevalence Survey was established, that consist:

- **Executive Committee (EC)**: (8 + 2 persons).

- **Technical Committee (TC)**: (43 persons) and divided into six sub-committee (Census unit, X-ray unit, Tuberculin Test unit, Laboratory unit, Statistic unit and Administration unit).

- **Survey Teams**: Each team had 4 units: Census unit, X-ray unit, Tuberculin Test unit and Laboratory unit). A total number of each team was around 15. The team was equipped with an X-ray mobile car or an X-ray portable unit and 4 vehicles.

The team also need close collaboration from provincial TB supervisor, district TB coordinator and community volunteers.
3-Field assessment

• August-September 2001, TC conducted a field assessment at selected area (42 clusters).

• The aim is to finalize enumeration areas for the survey and for field implementation plan.

• Two selected areas (can not access by car) was replaced by re-random at the same district.
The field assessment in selected areas were focused on:

- Road accessibility (distance, road condition, etc.)
- Seasonal accessibility (floating village, community profession, custom, religion etc.)
- Population structure (population statistic, household group, administrative list of family members etc.)
- Lodging, clean water supply and security for survey staffs.
- Mapping selected village
4-Field simulation

• November 2001, conducted **a field simulation** (1 day of census among 340 eligible people/4 households groups and 2 days of X-ray taking) to find out the ability of human resource and equipment (X-ray machine) and also local involvement.
  – The time consuming for taking census and interview.
  – To look the flow of people to be screened
  – Number of X-ray exposure during congestion of participant.
  – Film processor capacity and it weakness.
  – Collaboration of local authorities
  – Available time of people participation (farmer, factory worker,).

• **Problem:** Hot temperature inside darkroom gelled the solution.
Hot climate in tropical countries and with original design of darkroom, the film processor cannot continuously operated.

January 2002, modification of the darkroom for well working of film processor.
5-Develop Survey Manual

• Jan-Feb 2002, based on information from the field assessment and experience from field simulation and several internal meeting, the survey manual (for census, interview, x-ray unit and laboratory unit) has been developed by Technical Committee.
6-Training

• March 2002, despite a delay in procurement (x-ray equipment) but because of World Bank deadline, EC decided to organize **the training for survey staffs:**
  • Understanding of the rational of the survey and study protocols.
  • Data collection methods and techniques
  • Training separately and practice by component to estimate the time required and to identify possible weaknesses.

A special training session was arranged for TST and readers for standardization with collaboration of WHO and International Tuberculosis Surveillance Center (ITSC).
7-Pilot Study

- It is very crucial to organize pilot testing in order to evaluate the feasibilities and the reliabilities of the survey.

- End of March 2002, despite a delay of procurement, Executive Committee decided to conduct pilot study.

- X-ray equipment, consumables and gift (child & family) for participant were provided by JICA/TB Control Project.

- Team survey consist: Team leader(1), census(2), TST(3), X-ray(3), Central lab(1), Drivers(4), local staff (6).

- The remain survey staffs were observers.

- Planned: 8 days on sample size 720 from 2 villages.

- Result: compliant rate was 92% (TST inoculation 300 child's for 2 days, X-ray taking 560 persons/3days).
Collaboration with local community is very essential. They contributed to high participation rates.

How to reach and to get collaboration from them?
Interagency collaboration with flexible budget support is essential to assist a country to carry out a prevalence survey.
Census day:
The census staff confirm eligible population and asking for participation.

Proper IEC to get informed consent and to avoid a fearfulness for the people.
X-ray Car
Or
Portable Equipment
8-Revising on survey procedure

- Weekly field operation is suitable according to official mission letter.
- Day time of TST can be reduced (2 days inoculation and leaving on D6 morning).
- X-ray unit need one more people as x-ray assistance.
- Collaboration within units: TST nurse have to involve during census days, data collection and management and sometime on x-ray activities.
- Two times of sputum shipping to laboratory per cluster.
- Drivers are needed to do something that they can.
9-Survey team

- Three teams were formed to conduct fields surveys in 42 clusters.

- Each team: Team leader physician and 4 units:
  - The Census Unit: 2 doctors or medical assistant
  - The X-Ray Unit: 1 reader, 2 x-ray technician and 1 x-ray assistance
  - Tuberculin Test Unit: 3 nurses,
  - Laboratory Unit: 1 lab-technicians
  - With collaboration of: 1 provincial supervisor, 1 TB OD coordinator, 2 health center staffs and 5 local authorities.

- A field operation team was equipped with one mobile X-ray car or X-Ray portable unit (35cm x 35cm X-ray film) and 4 vehicles.

Note: A Japanese TB doctor also assisted each film team for X-ray reading.
• X-ray unit was equipped:
  – One set of X-ray portable (X-ray machine + X-ray stand) and one reserve X-ray machine.
  – Chest stand for cassette
  – X-ray protective screen + one protective lead apron.
  – One automatic film processor
  – One darkroom
  – Five pieces of 35cm x 35cm cassette with intensifying green screen type.
  – Radiographic grid with ratio 8:1
  – One X-ray cabinet (for 5 boxes of x-ray film).
  – 3 sets of lead markers (lead number should be enough for serial number and date of X-ray taking)
  – One gasoline electric generator (5.5 kilowatts-220volts/5-60Hz).
  – Consumables: 35cm x 35cm x-ray film (green type), reagents (Dev+Fix), clean water, sticker, plastic envelop, etc.

*** The above items should be put in the check list for X-ray staff.***
Materials for Laboratory unit:
- 2 ice-box (120 liters)
- 6 shelf (104 holes) for sputum container arrangement.
- 1 thermometer.
- Consumables: sputum container, permanent marker, plastic envelop, ice…
One spot specimen on day 1, and one early morning specimen on day 2
Follow-up Study on National TB Prevalence Survey, 2004
10-Overall survey procedure

1-Field preparation:

Two-three weeks before field survey:

- The team leader contacted the provincial health director and local authorities to facilitate cooperation.
- The team leader visited the selected villages and to clearly explain the study objectives and procedure.
  - Filling all family member in the households registry by local authorities (village leader) and transferred to census unit before taking census.
  - Making clear appointment to chief of family for census day.
  - Conducting a campaign with posters, leaflets, announcement and so forth.
2-Field implementation:
Basic Operation Schedule: Cluster/Week
• Sunday: Arrival & Basic Preparation
• Monday: Census/ Informed Consent, Arrival X-ray unit and Lab unit
• Tuesday/Wednesday: Interview, X-ray, TST inoculation, Sputum collection
• Thursday: Interview, X-ray, Sputum collection, Sputum transfer to CENAT
• Friday: Interview, X-ray, Sputum collection, TST-reading
• Saturday: TST reading (morning only), Departure
## Chart for basic operation

<table>
<thead>
<tr>
<th>Survey Staff</th>
<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Leader</td>
<td>Arrival</td>
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<tr>
<td>Census unit</td>
<td>Arrival</td>
<td>Census</td>
<td>Interviewing</td>
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<tr>
<td>TST unit</td>
<td>Arrival</td>
<td>Registration</td>
<td>Tuberculin Inoculation</td>
<td>Indurations reading</td>
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<tr>
<td>X-ray unit</td>
<td></td>
<td></td>
<td>X-ray taking</td>
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<tr>
<td>Lab unit</td>
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<td>Sputum collection</td>
<td>Sputum collection</td>
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</tr>
</tbody>
</table>

Shipping sputum specimen to reference laboratory (CENAT)
2-Field implementation:

Basic Preparation on arrival day: (Do)
- Received back filled household registry.
- Do addition the listed people (number of filled people should be more than target size).
- Ordering household registry (by group of household) and then divided its by 3 days of screening.
- Inform back the RDV on D1 of household chief through village leader and volunteers (chief of household group).
Flow of census taking (D1)

Direction of sample selection

Different Step in Census Day
1- Give back household registry to family chief
2- Pasting household number + RDV (3 digits)
3- Identifying eligible people by census staff
4- Finalizing eligible-sample size by Team Leader

Legend:
- Survey staff
- Local volunteer
- Family chief
Flowchart of screening days (D2-D5)

Legend:
- Subject
- X-ray film

Volunteer

Subject

Interviewers

Circulator

TST unit

Radiologist

Waiting space for screened subject

Film processing

X-ray taking space
Under house were the most place that we used for operation site.

Its benefits:
- close to subject,
- light reduction to X-ray unit,
- protect from rainfall,
- reduce hot climate for all.
With:

- funding provided by the MOH and World Bank, JICA and WHO,
- technical support by both national and international (WHO, JICA/TB Control Project Team, RIT, KNCV, KIT, Pasteur Institute etc.),
- a close coordination of health workers (central & local) and a great contribution from local communities participation,

the NTP of Cambodia has successfully conducted the 1st National TB Prevalence Survey in 2002 with a high participation rate of \(96.7\%\) was achieved: 30,032 out of 31,050 eligible subjects in 42 clusters across the country participated in the study.
Or Carry people to X-ray site
Or
Both
Thank you for your attention!