Report

Regional Workshop on TB Surveillance and Programme Monitoring and Evaluation

National Tuberculosis Institute, Bangalore
India, 20-24 July 2009

WHO Project: ….TUB …. 
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## Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AIDS</td>
<td>Acquired immune deficiency syndrome</td>
</tr>
<tr>
<td>ARTI</td>
<td>Annual risk of tuberculosis infection</td>
</tr>
<tr>
<td>COD</td>
<td>Cause of death</td>
</tr>
<tr>
<td>DOTS</td>
<td>Internationally recommended strategy for tuberculosis control</td>
</tr>
<tr>
<td>EPICENTRE</td>
<td>Epi-info-based software to create and evaluate national tuberculosis reports</td>
</tr>
<tr>
<td>EPTB</td>
<td>Extra Pulmonary Tuberculosis</td>
</tr>
<tr>
<td>HIV</td>
<td>Human immune deficiency virus</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium development goal</td>
</tr>
<tr>
<td>MDR-TB</td>
<td>Multidrug-resistant tuberculosis</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
</tr>
<tr>
<td>MO</td>
<td>Medical Officer</td>
</tr>
<tr>
<td>NSP</td>
<td>New sputum smear positive</td>
</tr>
<tr>
<td>NTI</td>
<td>National Tuberculosis Institute</td>
</tr>
<tr>
<td>NTP</td>
<td>National Tuberculosis Programme</td>
</tr>
<tr>
<td>PTB</td>
<td>Pulmonary Tuberculosis</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
<tr>
<td>SEAR</td>
<td>WHO South-East Asia Region</td>
</tr>
<tr>
<td>SEARO</td>
<td>South-East Asia Regional Office (New Delhi)</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>VR</td>
<td>Vital registration</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
1. **Introduction**

Substantial progress has been made during the last decade in capturing data as available on cases detected under the National tuberculosis programmes (NTPs) and their treatment outcomes. However, there is need to continue strengthening the routine surveillance component under NTPs not only for efficient programme management but also to draw meaningful inferences on the epidemiological trends of Tuberculosis (TB). This requires assimilation of data, to build up the capacity to compile, analyse and interpret what has been assimilated. In this region with high burden of TB, community based surveys to estimate prevalence of TB disease and infection and TB mortality remain very relevant to estimate the progress towards Millennium Development Goals (MDGs). Therefore, a Regional Workshop on Tuberculosis Surveillance and Programme Monitoring and Evaluation was held from 20 to 24 July 2009 at the National Tuberculosis Institute, Bangalore, India (NTI) with the following objectives:-

- To review current approaches to TB surveillance, monitoring and evaluation;
- To share the status and outcomes from surveillance, monitoring and evaluation activities in countries of the Region;
- To discuss plans for the implementation of the most appropriate TB surveillance, monitoring, evaluation and research methodology in each country, and
- To identify technical supports as required by Member States to strengthen TB surveillance, monitoring and evaluation in all member countries.

2. **Inaugural session**

The Workshop was inaugurated by Dr Prahlad Kumar, Director, NTI, who emphasised the importance of effective surveillance systems not only to evaluate the performance of TB control programmes but also to monitor the epidemiological trends of TB. Following this, Dr Md Khurshid Alam Hyder, MO-TB, WHO/SEARO, read out the opening address of Dr Samlee Plianbangchang, Regional Director, WHO South-East Asia Region. The message pointed out that TB continues to be a major public health problem in the region with an incidence of about 6 million cases and half a million deaths due to TB each year. Poverty, urbanization, migration and the spread of HIV/AIDS are some of the socio-economic factors that continue to hamper TB control efforts. The introduction of newer methodologies to analyse the socioeconomic and cultural determinants that affect TB control may help NTPs to develop interventions to mitigate such factors. It is also necessary to monitor the impact of our interventions on TB incidence, prevalence and mortality through improved surveillance and programme monitoring systems. He pointed out that since the previous
workshop on strengthening TB surveillance and monitoring held at NTI in 2006, several national programmes have been assisted to plan and implement annual risk of tuberculous infection, disease prevalence and mortality surveys. This workshop is being convened as a part of WHO’s overall support to Member States to further strengthen routine surveillance and assist to plan and implement appropriate studies and surveys, which conform to internationally recommended guidelines, illuminating epidemiological trends of TB and the progress towards MDGs for TB control. The recommendations and plans that will be developed during the workshop will add up to the existing material to provide much more reliable information on the TB situation, on which future plans and interventions for better TB control in our Region can be based.

After reading the message, Dr. Hyder briefed the participants from member countries, regional experts in the field of TB and surveillance and staff from WHO Headquarters, Regional Office and country offices were briefed on the objectives of the workshop. The inaugural session concluded after introductions by all participants.

3. Update on the global and regional tuberculosis burden

Globally, there were an estimated 9.3 million incidence cases of TB in the year 2007. Of these, about 2.7 million (29%) occurred in the South-East Asia Region (SEAR) alone. About 1.7 million people are estimated to have died due to TB, in the year 2007 of which, about 0.7 million (41%) occurred in SEAR. 80% of all TB cases aged between 15 and 54 years belong to the economically active age group. The estimated HIV prevalence among the adult incidence cases of TB varied from 0.3% in Bangladesh to 17% in Thailand. Globally, about 15% of all incidence TB cases were HIV positive. Though only about 3% of the incidence cases in the region are estimated to be multi-drug resistant (MDR), this translates into a fairly high number of patients.

In order to achieve the TB-related Millennium Development Goals (MDGs) for TB control, the main components of the Regional Strategic Plan to Control TB (2006-2015) include the following:

- Sustaining and enhancing DOTS to reach all TB patients;
- Improve case detection and treatment success rates;
- Establishing interventions to address TB/HIV and drug-resistant TB;
- Forging partnerships to ensure equitable access to an essential standard of care to all TB patients; and
- Contributing to strengthening of health systems.
4. Measuring progress towards the Millennium Development Goals and WHO framework

The aim of MDGs for TB control is to reverse the trend in incidence of TB by 2015 and achieve a reduction of about 50% the prevalence and mortality rates by 2015 compared to 1990 levels. Thus the targets for programme performance are aimed to detect at least 70% of the new sputum smear positive cases of pulmonary TB (PTB) each year and treat at least 85% of them successfully.

The specific methods used by the WHO for estimating the incidence and prevalence of TB and TB deaths in each country; and the statistical methods used to estimate their trends in time were presented in the workshop. These methods also take into account the proportion of HIV positives among smear positive and smear negative incidence TB cases and the variability in disease duration & case fatality rates by HIV status, type of TB case (smear positive/negative) and treatment status (DOTS, non-DOTS, untreated). However, the impact of anti-retro-viral therapy on the estimates of incidence, prevalence and mortality due to TB has not yet been figured out.

4.1 Routine surveillance

In the south-east Asia region, population coverage with DOTS is complete along with robust recording and reporting systems. Reporting by different health agencies involved in NTPs at different administrative levels is generally tends to be complete and timely. The diagnosis of smear positive PTB is believed to be reliable and most sputum smear positive cases are actual TB cases. In India, the system for electronic transmission of NTP reports from district to national level is also in place. The programme performance in member countries is being regularly disseminated through annual /quarterly reports. However, a large proportion of public sector hospitals and non-NTP health providers have not yet been brought under the standardised diagnostic & treatment practices and recording & reporting system of the respective NTPs. The TB-HIV collaborative activities are part of the reporting systems in some countries like Thailand, Myanmar and India.

The notification data of the member countries reveal that about 69% (case detection rate) of the estimated incidence smear positive cases were detected in the year 2007 (compared to 62% at the global level). About 87% of the new smear positive (NSP) cases detected during the year were successfully treated. However, of the cases that were missed from being detected globally, about 70% were from the SEAR countries. This underlies the need for further improvements in the case detection rates by member countries.
As regards, the review of TB case notification data since 1995, major observations made are as under:-

- Variable trends in notification rates observed in different countries of the region, are largely attributable to changes in case finding efforts and diagnostic capacity rather than any real change in incidence. Generally, the trends in notification rates of NSP cases were in parallel with the trends in suspect evaluation rate.

- Overall, 86% of all cases (new + retreatment) diagnosed in the region were ‘new cases’. Cases of PTB constituted 84% of all new cases. About 61% of new PTB cases were smear positive.

- The proportion of new cases among all cases is unexpectedly high in some countries of the region. This could be due to misclassification of a proportion of ‘retreatment cases’ as ‘new cases’.

- The recent trend of increase in proportion of extra-pulmonary TB (EPTB) cases in some countries may be due to increased involvement of medical colleges and hospitals in the reporting system.

During the workshop it was the consensus that the efforts to continuously strengthen the routine surveillance under NTPs be undertaken as under:-

- Ensure completeness of reporting and reliability of data which should also be accurate and timely.

- Strengthen supervision of NTPs at various levels, including that of recording and reporting systems.

- Systems may be strengthened to capture the data on cases detected by health agencies/providers other than NTPs, under the ambit of NTP surveillance. Miss-diagnoses or miss-classifications of types of TB cases may however be avoided by proper training.

- Avoid double counting of the cases using unique identifiers

- The data should be consistent with known parameters in respect to proportions of NSP cases out of all new pulmonary TB cases, the proportions of NSP cases detected out of all suspects examined, proportions of extra-pulmonary TB cases and the male-female ratio (external validity).
Analysis of the routine surveillance data at the sub-national levels should also be
carried out with the primary objective of gaining insight into diagnostic practices and
for monitoring other programme components.

Time trends in notification rates may be examined by age, sex, type of case and
geographical units. Analysis of their relationship with programme inputs in terms of
diagnostic efforts (numbers of participating labs and treatment units, suspect
evaluation rates, proportion of smear positives among suspects, etc.) will further
help to interpret whether the trends in notification rates reflect the trends of
incidence. However, trends in average age of TB cases should be interpreted with
care where the reliable demographic information is not available.

Mortality data generated under NTPs may be cross validated by linkage with vital
registration system in order to accurately assign the cause to the deaths occurring during
the period of anti-TB treatment (ATT) and to capture deaths due to TB occurring after
completion of ATT. It is estimated that presently less than 1% of all deaths estimated to
occur in the region are captured by the vital registration systems.

During the workshop, methods to estimate the following were proposed to the
participants:

- Proportion of TB cases who do not have access to health care.
- Proportion of cases that do not seek care despite having access
- Proportion of cases that seek care but are not diagnosed
- Proportion of cases that are diagnosed by NTP/non-NTP providers, but
  not reported

The participants were also asked during the workshop to provide their rough estimates of
the proportions of cases missed at each of the levels listed as above. It was suggested that
behavioural studies and operational research like practices of diagnostic procedures,
additional yield of cases through contact tracing, etc may be carried out to arrive at better
estimates of the missed cases at these levels. The completeness and accuracy of notification
data may be cross validated through inventory of laboratory registrations, hospital
registries, pharmacies, HIV notification data with TB diagnosis, data from prisons,
workplace and insurance agencies. Capture-recapture studies would also help to find out
any under/over-estimation of the case notifications under NTP. However, at least three
sources of data should be available for this purpose.
4.2. Epidemiological surveys

Since the baseline year for MDGs is 1990, the surveys (national level, sub national) carried out in the region since 1990, to estimate the prevalence of bacteriologically positive PTB and to estimate ARTI are presented at tables 1 & 2. This data was presented by the country participants during the workshop.

Presently, national level surveys to estimate prevalence of PTB are in progress in Bangladesh and Myanmar while sub-national surveys are being carried out in seven sites in India. These surveys along with the national level survey of Indonesia in 2004 would provide the baseline estimates for the study of trends in prevalence of TB by means of another round of repeat surveys before 2015.

Three rounds of disease prevalence surveys in Thiruvallur district in South India between 1999-2006 revealed a decline of about 12% per year in the prevalence of smear positive as well as culture positive PTB. The overall decline over this period of DOTS implementation was 50%. In this area, no statistically significant decline was observed during several rounds of surveys carried out during the pre-DOTS period of 1968-1986. No trends are yet available from any other areas of the region. Two sub-national surveys in Bangladesh were carried out adopting different methodologies in different areas and were thus not comparable.

The baseline national level tuberculin surveys are presently in progress in Sri Lanka and Bhutan. In Thiruvallur district, South India, three rounds of tuberculin surveys between 1999-2003 revealed a decline in ARTI at the rate of about 6% per year. To estimate the trends in ARTI in different parts of India since the first zonal level surveys during 2000-03, repeat zonal level tuberculin surveys are presently in progress in India.

A national level study to find out cause of death (COD) for 1 million events of death has been completed in India under the leadership of the office of Registrar General and Census Commissioner. Similar studies have also been carried out in two states of India and selected provinces of Indonesia. All of these studies are based on investigating COD by verbal autopsy and their results are awaited.

It was also re-iterated during the workshop that the ARTI rates may no longer be used for estimating incidence of TB. The tuberculin surveys may be used for the study of trends in ARTI only in such areas where the survey data are likely to be interpretable.
### Table: Prevalence of PTB per 100,000 populations

<table>
<thead>
<tr>
<th>State &amp; District</th>
<th>Study period</th>
<th>Age (yrs)</th>
<th>Sample Size</th>
<th>Screening Method</th>
<th>Culture + ve</th>
<th>Smear + ve</th>
<th>culture and/or smear + ve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morena (M. P), India</td>
<td>1991–1992</td>
<td>&gt;14</td>
<td>11,097</td>
<td>Symptoms</td>
<td>-</td>
<td>-</td>
<td>1270</td>
</tr>
<tr>
<td>Delhi, India</td>
<td>1991</td>
<td>&gt;4</td>
<td>27,838</td>
<td>MMR</td>
<td>-</td>
<td>-</td>
<td>330</td>
</tr>
<tr>
<td>Car Nicobar (A &amp; N), India</td>
<td>2000–2001</td>
<td>&gt;14</td>
<td>10,570</td>
<td>Symptoms</td>
<td>-</td>
<td>729</td>
<td>-</td>
</tr>
<tr>
<td>Thiruvalur (T. N), India</td>
<td>1999–2001</td>
<td>&gt;14</td>
<td>83,425</td>
<td>MMR + symptoms</td>
<td>609</td>
<td>326</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td></td>
<td>85,474</td>
<td></td>
<td>451</td>
<td>257</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2001–2003</td>
<td></td>
<td>89,413</td>
<td></td>
<td>311</td>
<td>169</td>
<td></td>
</tr>
<tr>
<td>74 Sub districts, Bangladesh</td>
<td>2001</td>
<td>&gt;11</td>
<td>266,189</td>
<td>Symptoms</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matlab rural area, Bangladesh</td>
<td>2004–05</td>
<td>&gt;14</td>
<td>59,395</td>
<td>Symptoms</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia-National level</td>
<td>2004</td>
<td>&gt;14</td>
<td>50,134</td>
<td>Symptoms</td>
<td>104 (66-142)</td>
<td></td>
<td>(66-142)</td>
</tr>
<tr>
<td>Yangon division, Myanmar</td>
<td>2006</td>
<td></td>
<td></td>
<td></td>
<td>279 (193-364)</td>
<td>537 (421-653)</td>
<td></td>
</tr>
</tbody>
</table>
J& K: Jammu & Kashmir, T.N: Tamil Nadu, Mah.: Maharashtra, Kar.: Karnataka, M.P: Madhya Pradesh; -: Not available – CI: Confidence Interval

Table: Tuberculin surveys in other countries

<table>
<thead>
<tr>
<th>Area</th>
<th>Year</th>
<th>Sample size</th>
<th>Age group (Years)</th>
<th>Estimated ARTI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Sumatra</td>
<td>2006</td>
<td>5653</td>
<td></td>
<td>1-1.3§</td>
</tr>
<tr>
<td>Nusa Tenggara, Indonesia</td>
<td>2007</td>
<td>5479</td>
<td>6-9</td>
<td>1</td>
</tr>
<tr>
<td>Central Java</td>
<td>2007</td>
<td>6943</td>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td>North Sulawesi</td>
<td>2008</td>
<td>6557</td>
<td></td>
<td>1.9-2.5§</td>
</tr>
<tr>
<td>South Kalimantan</td>
<td>2008</td>
<td>6359</td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>Nepal sub-national surveys in 17 selected areas</td>
<td>1985-95</td>
<td>6-10</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>National Level</td>
<td>2006-07</td>
<td>17260</td>
<td>5-7</td>
<td>0.9(0.5-1.2)</td>
</tr>
<tr>
<td>Bhutan Thimphu, Mongar and Bumthang districts</td>
<td>1991</td>
<td>1736</td>
<td>6-14</td>
<td>1.9</td>
</tr>
<tr>
<td>Bangalore</td>
<td>1998</td>
<td>4936</td>
<td>5-8</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>3354</td>
<td>5-8</td>
<td>1.5</td>
</tr>
<tr>
<td>Thiruvallur</td>
<td>1999-01</td>
<td>12854</td>
<td>0-9</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>2004-05</td>
<td>8668</td>
<td>0-9</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>2001-03</td>
<td>8329</td>
<td>0-9</td>
<td>1.2</td>
</tr>
<tr>
<td>Orissa</td>
<td>2002</td>
<td>10626</td>
<td>1-9</td>
<td>1.7</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>2005-06</td>
<td>3636</td>
<td>5-9</td>
<td>1.4</td>
</tr>
<tr>
<td>Khammam</td>
<td>2001-02</td>
<td>8329</td>
<td>5-7</td>
<td>1.5</td>
</tr>
<tr>
<td>Zonal level surveys (4 zones)</td>
<td>2000-03</td>
<td>52300</td>
<td>6-9</td>
<td>N. Zone-1.9 W. Zone-1.6 E. Zone-1.3 S. Zone-1.0 (National average= 1.5)</td>
</tr>
<tr>
<td>DPR Korea National level</td>
<td>2007</td>
<td>11182</td>
<td>7-8</td>
<td>3.0</td>
</tr>
</tbody>
</table>
Estimates very depending upon statistical method of estimation, ( ):95% CI

### 4.3 Framework for impact measurement

Based on the recommendations of the WHO Global task force on TB impact measurement, the framework suggested for monitoring and surveillance is summarized below:-

| General | 1. Identify components of TB surveillance that need to be strengthened.  
2. Ensure completeness and internal consistency of the data.  
3. Strengthen capacity in Monitoring and Evaluation (M&E)  
4. Periodic review and updating of methods used to produce WHO estimates of prevalence and incidence and mortality rates of TB |
|---|---|
| **TB incidence** | 1. Continuously strengthen routine surveillance until TB notification rates are a close proxy of TB incidence and consistent with current knowledge on TB epidemiology (external consistency). The trends in notification rates should reflect trends in incidence.  
2. Periodic analysis of reliability and coverage of TB notification data to estimate the total number of incidence TB cases and trends in TB incidence  
3. Systematic analysis of TB notification data  
4. Certification of TB notification data if analyses show country's notification data to be in close proxy to the estimated TB incidence  
5. Cross-validate incidence estimates using TB mortality data from VR systems |
| **TB prevalence** | 1. Disease prevalence surveys in 21 global focus countries, designed and implemented according to WHO guidelines and Taskforce recommendations  
2. For countries not implementing surveys, disease prevalence may be estimated indirectly from estimates of TB incidence and duration of TB disease |
| **TB mortality** | 1. Development/strengthening of VR systems so that all TB deaths are reliably recorded  
2. Where national VR systems not yet available, sample VR systems may be adopted as an interim solution  
3. For countries without reliable national or sample VR system, Indirect estimates of mortality may be made using estimates of TB incidence and case fatality rate |
Impact evaluation

1. Periodic studies to evaluate impact of TB control on TB incidence, prevalence and mortality

4.4 Measuring HIV in TB and Multi-Drug resistance

Provider initiated HIV testing and counselling of TB cases has been incorporated nationally in Thailand and Myanmar while it is being carried out in selected districts in India and in selected provinces of Indonesia. However, the available data on HIV among TB cases is grossly insufficient and there is an urgent need to scale up TB-HIV surveillance in the region to cover at least a representative sample of the cases. This would also facilitate refining the estimates of TB incidence.

Though surveys to find out the proportion of multi-drug resistant cases among all new and retreatment cases are being carried out in many countries of the region, these require to be augmented.

5. Country plans to improve TB Surveillance and programme monitoring and evaluation system

To improve the TB surveillance, the plans for the period 2009-2011, proposed during the workshop by participants from member countries are as under:

<table>
<thead>
<tr>
<th>List of activities</th>
<th>Country</th>
<th>Countries requiring technical assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Improve recording and reporting capacity:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Improve coverage of Recording &amp; Reporting (R&amp;R)</td>
<td>Indonesia, Myanmar, Timor Leste</td>
<td></td>
</tr>
<tr>
<td>ii. Improve supervision of R&amp;R activities, from data collection to data validation and transmission</td>
<td>Myanmar, Timor Leste, Maldives, Bhutan</td>
<td>Myanmar</td>
</tr>
<tr>
<td>iii. Progress from a paper-based to an electronic-based system</td>
<td>Indonesia, Myanmar Maldives, Bhutan</td>
<td>Myanmar, Bhutan</td>
</tr>
<tr>
<td>iv. Progress to web-based system</td>
<td>Myanmar</td>
<td></td>
</tr>
<tr>
<td>2. Improve capacity to analyse TB notification and other supporting data at national level</td>
<td>Indonesia, Bangladesh, Myanmar, Thailand, Timor Leste, Bhutan</td>
<td>Thailand, Timor Leste, Bhutan</td>
</tr>
</tbody>
</table>
3. Improve capacity to analyse TB notification and other supporting data at sub-national level

<table>
<thead>
<tr>
<th>Myanmar, Thailand</th>
<th>Sri Lanka, Maldives</th>
<th>Thailand, Maldives</th>
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Table Contd...
<table>
<thead>
<tr>
<th>List of activities</th>
<th>Country</th>
<th>Countries requiring technical assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Improve feedback of data analysis and interpretation to TB staff and other health care workers in the peripheral level</td>
<td>Indonesia, Myanmar, Timor Leste,</td>
<td></td>
</tr>
<tr>
<td>5. Perform study to identify and eliminate duplicate and misclassified records at national level</td>
<td>Bangladesh, Myanmar</td>
<td></td>
</tr>
<tr>
<td>6. Perform data quality assessment (e.g. using data quality assessment tool)</td>
<td>Bangladesh, Myanmar, Bhutan</td>
<td>Myanmar, Bhutan</td>
</tr>
<tr>
<td>7. Improve feedback of data analysis and interpretation to TB staff and other health care workers in the peripheral level</td>
<td>Myanmar</td>
<td>Myanmar</td>
</tr>
<tr>
<td>8. Perform, in a sample of health care facilities, studies of the yield of patients:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. by comparing number of TB cases with number of suspects examined and/or number of suspects examined with number of chronic respiratory cases attending health care facilities</td>
<td>Myanmar, Thailand, Timor Leste, Bhutan</td>
<td>Myanmar</td>
</tr>
<tr>
<td>ii. diagnosed through active case finding</td>
<td>Myanmar</td>
<td></td>
</tr>
<tr>
<td>iii. diagnosed through contact investigation</td>
<td>Timor Leste, Maldives</td>
<td></td>
</tr>
<tr>
<td>iv. diagnosed through PPM</td>
<td>Indonesia, Sri Lanka</td>
<td></td>
</tr>
<tr>
<td>9. Perform cross-validation of TB notification data with other pre-existing sources of TB data</td>
<td>Indonesia</td>
<td>Indonesia</td>
</tr>
<tr>
<td>10. Perform cross-validation of TB notification data with other newly collected TB data (for example, introduce new registries to be completed by non-NTP providers)</td>
<td>Indonesia</td>
<td>Indonesia</td>
</tr>
<tr>
<td>12. Perform a national survey of HIV prevalence among TB registered patients</td>
<td>Bangladesh, Timor Leste, Sri Lanka, Maldives, Bhutan</td>
<td>Timor Leste, Bhutan</td>
</tr>
<tr>
<td>13. Perform a national survey of TB disease</td>
<td>Indonesia, Thailand</td>
<td>Indonesia, Thailand</td>
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</tbody>
</table>
### 6. Conclusions and recommendations

#### 6.1 Conclusions:

- There has been steady progress in TB surveillance and control in countries of SEAR. Data from various sources indicate that disease burden is stable in most countries in the regional, though there might be decreasing trends in some. A national prevalence survey of TB disease is almost completed in Bangladesh and underway in Myanmar. Methods to estimate the burden of TB were presented and discussed in detail.

- Limited data on changes in case finding efforts over time make it difficult to interpret time-changes in case notifications in several countries.

- Incompleteness of routine surveillance data was described in several countries where there is no systematic monitoring of data quality and completeness, including simple checks.

- There is over-reliance on tuberculin surveys to assess the burden of TB and its trends in several countries. Results from tuberculin surveys are often very difficult to interpret and use and the performance of such surveys is unpredictable.

- There is over-reliance on sub-national surveys as opposed to national surveys in most countries.

- Most countries of SEAR lack a sound surveillance system for assessing and monitoring the burden of TB/HIV and MDRTB.

- Extensive discussions on time changes in TB determinants and a thorough analysis of notification data allowed to improve the documentation of the performance of case finding and reporting during the workshop. The analysis will be the basis for an extensive revision of estimates of TB incidence, prevalence and mortality.

- Country participants updated plans to strengthen national surveillance systems, improve the assessment of disease burden and the impact of TB control.
6.2 Recommendations for National Tuberculosis Programmes

- Ensure appropriate plans that should comprehensively cover activities and budgets required to strengthen surveillance and undertake planned national survey of TB disease, HIV prevalence among TB registered patients and TB drug resistance for reducing the burden of TB, including the following:

  - Conduct formal assessments of the quality of TB data e.g. using GF data quality assessment tools;

  - Urgently plan for national surveys of TB drug resistance in countries where no representative data are available;

  - Urgently strengthen surveillance of HIV/TB and consider nationwide surveys of HIV in new TB patients in countries with limited data;

  - Undertake operational research and studies to identify and eliminate duplicate and misclassified records at national level, yield of patients that will help further to understand trends and support the development of targeted interventions;

  - Strengthen capacity to improve recording and reporting system, analyze TB notification and other supporting data at national and sub national levels and improve feedback of data analysis and interpretation to TB staff and other health care working in the peripheral level;

  - Systems should be developed on capturing data on cases diagnosed in hospitals under other public sector units. Non-NTP health facilities like private health facilities and NGOs should also be made part of routine surveillance. It should however be ensured that the case definitions are followed accurately. Data from various sources can be linked to eliminate double counting by use of common identifiers and appropriate software;

- Appropriate action need to be taken for accurate diagnosis of TB among children and capturing the same under routine surveillance data;
Co-ordinate with WHO in finalizing the report of the workshop, and improve estimates of TB disease burden.

6.3 Recommendations for WHO and partners

- A report of the analysis conducted during the workshop to be shared with countries for feedback and corrections prior to updating estimates of TB disease burden at WHO/HQ;

- WHO and partners to provide technical assistance for developing and strengthening the monitoring and evaluation components of GF applications;

- Continue to develop standard protocols and guidelines to assist Member States to undertake population based representative surveys/studies, to establish sound baselines and measure trends in TB case detection, treatment success, incidence, prevalence and mortality;

- Continue in developing guidelines and assist in building capacity through training and maintaining a roster of consultants to provide technical assistance to Member States and build national capacity in order to systematically analyze routinely collected programme data, to better understand emerging trends and to develop targeted programme interventions;

- Assist Member States on operational research priorities related to TB surveillance and monitoring and assist in promoting and implementing operational research activities, particularly those related to better analyzing and using data from routine surveillance.
Annex 1

Programme

20th July 09

Opening

Objectives

Introduction of participants

Measuring TB incidence, prevalence and mortality: an overview of the recommendations of the WHO Global Task Force on TB Impact Measurement

Discussion

WHO framework for assessment of TB burden - Understanding the impact of disease control

Discussion

Causal model for TB performance: challenges for its development and usefulness for programme management

Experiences from countries: Bangladesh, India, Indonesia, Myanmar, Nepal

Discussion on country surveys

21st July 09

Assessment of whether TB notifications include all incidence TB cases: Capture-recapture studies

Group work

Estimating the missing TB cases

Assessing the reliability and completeness of notification data: Questions and discussion
Group work: Assessing the reliability and completeness of notification

22nd July 09

Presentation by three countries on their main findings of the second day

Assessment of whether trends in TB notifications over time reflect trends in TB incidence

Discussion

Group work: Review analyses of the relationship between trends in TB notifications and variables (Templates provided prior to the workshop).

Interpretation of these analyses for trends in TB incidence

23rd July 09

Presentation by three countries on their main findings of the third day

WHO methods and assumptions based on analysis done during the workshop

Country plans: review of previous plans, progress made, proposed method to develop country plans during the next group work session

Group work: (continued)

Complete the template
Revise/update as appropriate
Country plans and technical assistance required to improve national estimates of TB Incidence, Prevalence and Mortality

Reporting format for WHO Global -TB Report 2010

Group Discussions

24th July 09

All countries present their plans
Debriefing on group work
Conclusions
Recommendations
Closing
Annex 2

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