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# Tuberculosis Surveillance and Monitoring

*Report of an Intercountry Consultation  
National TB Institute, Bangalore, India, 28-31 August 2006*

WHO Project: ICP TUB 001



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## Abbreviations

AIDS	acquired immunodeficiency syndrome
ARTI	annual risk of tuberculosis infection
DOTS	internationally recommended strategy for tuberculosis control
EPICENTRE	Epi-info-based software to create and evaluate national tuberculosis reports
GIS	geographic information system
HIV	human immunodeficiency virus
IMRSSP	Indonesian Mortality Registration Strengthening System Project
JATA	Japanese Anti-Tuberculosis Association
MDG	millennium development goal
MDR-TB	multidrug-resistant tuberculosis
M&E	monitoring and evaluation
OPD	out-patient department
PHC	primary healthcare centre (India)
PPD	purified protein derivative
NGO	nongovernmental organization
RNTCP	Revised National Tuberculosis Control Programme (India)
SEA Region	WHO South-East Asia Region
SEARO	South-East Asia Regional Office (New Delhi)
STAR	software tool for analysis and reporting
STC	short-term consultant
TA	technical assistance
TB	tuberculosis
TU	Tuberculosis Unit (India)
VCT	voluntary counselling and testing
VR	vital registration
WHO	World Health Organization



## 1. Introduction

The Inter-Country Consultation on Tuberculosis (TB) Surveillance and Monitoring was held from 28 to 31 August 2006 at the National Tuberculosis Institute, Bangalore, India. This consultation was a follow-up to the Inter-Country Workshop on Surveillance, Monitoring and Evaluation, held from 21 to 24 September 2004 in New Delhi, India. National tuberculosis programmes have since started to update and streamline their TB data basis and make better use of the data available. At the global level, consensus has been reached to modify the standard recording and reporting formats to capture additional information necessary to monitor implementation of the new Stop TB Strategy.

The objectives of the consultation were to:

- Review the current status of TB surveillance and monitoring, including monitoring of incidence, prevalence and mortality in the SEA Region;
- Identify the most appropriate methodologies to be used in Member countries to strengthen TB surveillance and monitoring; and
- Prepare draft country plans to measure the impact of interventions on TB incidence, prevalence and mortality.

## 2. Inaugural session

The consultation was inaugurated by Dr Prahlad Kumar, Director, National Tuberculosis Institute, Bangalore. Dr Kumar highlighted the importance of effective surveillance mechanisms to evaluate both programme performance and to measure impact on TB prevalence and mortality, the two indicators set for the TB targets under the Millennium Development Goals.

Following the welcome and introductions, Dr Nani Nair, Regional Adviser (TB), WHO/SEARO read out the opening address of Dr Samlee Plianbangchang, Regional Director, WHO South-East Asia Region. Underlining the fact that despite the overall high case detection rate of 64%

and treatment success rate of above 85% achieved through DOTS in the South-East Asia Region, the Regional Director said that TB continued to be a major public health problem, affecting the health and lives of millions in the Region. Noting the very slow decline in the burden of disease and mortality, he said socioeconomic factors such as poverty, urbanization, migration and the spread of HIV/AIDS and others continue to hamper TB control efforts, and would need to be taken into consideration when TB control plans are developed, implemented and monitored in order to achieve the expected impact. The more comprehensive and holistic interventions under the new Stop TB Strategy, now part of the Regional Strategic Plan 2006-2015 and the national plans for TB control for the next five years, therefore needed to be fully implemented.

Surveillance and monitoring are key elements that will help measure whether the strategies and plans in place are succeeding in producing the expected impact on the epidemic. In this context, he said all national TB control programmes must improve their capacity to more accurately and easily collect, compile and analyse data from routine surveillance and vital registration systems. A better analysis of the burden and trends in the specific TB indicators would also help in guiding future policy, strategy and in undertaking timely and targeted interventions for better impact.

He concluded by saying that this consultation was being convened as part of WHO's overall support to Member countries in developing and improving national TB control programmes. He urged participants to develop sound plans towards improving surveillance and monitoring to obtain reliable baselines and trends on which to base future plans and interventions for better TB control in the Region.

The participants were briefed on the objectives of the consultation by Dr Nair. The consultation was attended by 35 participants from all Member countries, regional experts in the field of TB and surveillance and staff from WHO Headquarters, Regional Office and country offices.

### **3. Update on the global and regional tuberculosis burden**

TB cases are decreasing in most regions of the world. The highest per capita TB rates are in Africa, partly because of the high HIV prevalence. This drives

the global TB incidence upwards. In Eastern Europe, cases of multidrug-resistant tuberculosis (MDR-TB) are increasing.

In the South-East Asia Region, the burden is estimated to be 4.9 million cases with 3 million new cases and 550 000 TB deaths annually. TB notifications in SEAR Member countries have gradually risen to above 1.9 million per year. Tuberculosis affects the economically active age group with 80% of all TB cases aged between 15 and 54 years. New, smear-positive cases peak in the 25-44-age group. The extent of MDR-TB in the Region is estimated to be relatively low (under 3%). However, this translates into a fairly high number of patients. HIV prevalence among adult TB cases varies widely in the Region from none in countries with a low prevalence of HIV, up to 8.5% in Thailand.

The Regional Strategic Plan to Control TB (2006-2015) was developed in consultation with national TB programmes, technical partners and experts. It outlines the key strategic directions that the Region will pursue in order to reach the TB-related Millennium Development Goals (MDGs) as a milestone towards elimination of tuberculosis. Four main strategies are included in the Plan:

- 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 health systems strengthening.

#### **4. Framework for measuring progress towards the Millennium Development Goals**

The World Health Assembly, in 2000 set two targets to be reached by all Member countries by 2005; these were:

- To reach 100% DOTS coverage;
- To achieve at least a 70% case-detection rate for new smear-positive cases; and

- To cure at least 85% of the detected new smear-positive cases (operationally interpreted as *treatment success*). These targets largely measure programme implementation. The MDGs, however, call for halting and beginning to reverse the incidence of TB by 2015, which are impact targets.

Following the recommendations of the fourth meeting of the SEA Region Technical Working Group on TB in Kathmandu in December 2005, two targets linked to the MDGs were preponed to be reached by 2010 in the Region as a whole:

- To reduce the prevalence of TB by 50% (compared to the baseline in 1990);
- To reduce the TB mortality by 50% (compared to the baseline in 1990).

In addition, the Stop TB Partnership has set a goal of eliminating TB, to be reached by 2050, defined as less than one new case per million population.

The Global Plan to stop TB (2006-2015), based on the new Stop TB Strategy, aims to achieve the following:

- Effective DOTS expansion that will lead to the treatment of approximately 50 million TB patients of whom,
- Approximately one million are expected to be treated for multidrug-resistant TB
- Antiretroviral therapy made available to approximately three million HIV-infected TB patients and
- 30 million people offered preventive therapy
- One safe and effective vaccine for TB, developed and licensed
- Treatment duration shortened to 1-2 months, and
- By 2015, the halving of prevalence and death rates due to TB globally.

## **5. Review of methods for measuring progress towards MDGs**

In order to achieve and monitor the above goals and plans, an adequate budget must be allocated for monitoring and evaluation to keep track of the reduction of morbidity and mortality, new infections, recurrence of old infections and prevalent cases. The methods used to achieve this are surveys, routine surveillance and use of data from various other sources.

Surveys are well-controlled studies but consist of large samples. They are fairly difficult to execute, expensive and sometimes hard to interpret. Surveys are helpful in measuring prevalence of infection (tuberculin surveys), prevalence of disease, incidence of disease or prevalence of HIV in TB patients. On the other hand, surveillance data are already routinely collected by national programmes. They often consist of very large numbers or variables. They need to be compiled and analysed to draw useful conclusions. Other data e.g. from vital registration systems or verbal autopsies may be helpful and supplementary to the previous two methods.

Other factors and processes that need to be kept in mind while collecting and analysing data include the trends in TB notification rates and underlying causes of changes in trends (real changes in incidence versus changes in case finding or reporting); quality of data, coverage of reporting units, classification of reporting of different forms of TB (smear-positive, smear-negative, extra-pulmonary, new or retreatment cases); treatment outcomes; consistency across districts, provinces and states; consistency across ages and genders. Peru was the first developing country to show a decrease in incidence due to TB control efforts in contrast to the experience in developed countries where TB had been shown to decline due to improved socio-economic conditions.

The constraints faced due to lack of epidemiologists, expert statisticians and analysts in Member countries to analyse the quality and implications to programmes of routinely collected data, was also discussed briefly. Some of the suggestions were to utilize statistical and mathematical talent within Member countries employed in industries such as Information Technology or the academia. Another suggestion was to offer a career path to analysts through sustainable funding mechanisms. A related health systems issue that came up was that there are programmes in four Member

countries delivering all services through decentralized mechanisms. In order to plan for effective TB monitoring and evaluation, there was a need for a person at the central level to coordinate sub-national level activities.

## **6. Better assessing TB incidence, prevalence and mortality at country level – Experience from countries**

### **6.1 India**

A nationwide ARTI<sup>1</sup> survey was undertaken during 2000-2003 in four zones among children aged 1 to 9 years. The sample was stratified between rural and urban areas. The survey showed that the TB incidence is significantly higher in urban areas compared to rural areas. The overall (national) ARTI was estimated to be 1.5%, while new (incident) cases were estimated to be 1.8 million (168/100 000) including 0.8 million smear-positive (75/100 000) and one million smear-negative and extra-pulmonary cases. A repeat ARTI survey is planned in 2007-08 using the same methodology.

Mortality studies in the large states of Andhra Pradesh and Orissa are proposed. These would be community-based mortality surveys based on the use of verbal autopsies. A large-scale national disease prevalence survey which is the ideal way to get direct estimates of the TB burden – is not feasible due to operational inconvenience and the huge cost involved. Therefore, five to six survey sites will be established in each of the four zones of the country, where screening will be done through X-ray and symptom elicitation followed by smear and culture to corroborate the findings of the ARTI survey.

In the discussions it was pointed out that over the years, changing case definitions had contributed to variable results over time. Figures for past years are not easily available for immediate analyses and assessments of historical trends. Assessments are therefore based on estimates obtained from different sources using various methodologies. Programmes other than the Revised National Tuberculosis Control Programme (RNTCP) must be made aware of the methods and results of these activities as this may have a

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<sup>1</sup> ARTI: annual risk of tuberculosis infection

“cross-pollination” effect and help inculcate a monitoring and evaluation culture among other public health disciplines.

Concerns expressed related to the difficulty in ensuring that standard protocols for surveys are adopted and used by all countries. Non-standard protocols would lead to a large variation in the interpretation of results within the country as well as between countries. With regard to data from out-patient departments, it was felt that in countries like India where OPD data may not be reliably collected over large parts of the country, it would not be advisable to use the numbers of chest symptomatics as a proxy correlate of TB suspects in the community.

## **6.2 Indonesia**

In Indonesia, central monitoring is done using an excel-based data collection system. The current version provides data by smear status as well as the number of TB/HIV cases classified by HIV treatment and clinical status and TB among children. The first level of computerization is done at the district level by entering the information from the TB treatment card. Reports on case finding, sputum conversion and treatment results as well as basic analysis and graphs are automatically generated. The district data are electronically forwarded to the provincial level, where it is compiled and quarterly reports are generated.

Disease prevalence and ARTI surveys as well as TB mortality studies were conducted in 2004-2005. The prevalence survey is being supplemented by tracking hospital referrals and strengthening and optimizing capture of data from all peripheral health centres. The TB mortality survey was carried out to help develop cause-of-death reporting mechanisms as well as monitoring progress towards achieving the TB-related targets through collecting cause-specific mortality data.

What has been noted is that the prevalence rate fell 3% per year between 1980 and 2004. Notification rates have been steadily increasing since 2001 to the current level of 120 per 100 000 population. Case finding continues to increase against a backdrop of 100% DOTS coverage. Future plans include the recruitment of an M&E officer, training of staff on TB electronic software, implementation of the TB Register at all basic health units, improving supervisory skills and provision of more analysis and feedback to various levels of the system.

### 6.3 Myanmar

Myanmar conducted TB/HIV sentinel surveillance in 20 sites between 1995 and 1997. The male–female ratio was 4:1 in the 25–39-year age group. The HIV prevalence among TB patients varied between more than 10% in the eastern part of the country and less than 2% in the western part. In 2004, the HIV prevalence among TB patients was seen to increase to 6.8%. Piloting of sentinel surveillance conducted at four sites in 2006, showed that HIV prevalence among TB patients had further increased to 10.3%.

Training and deployment of the WHO-designed STAR<sup>2</sup> reporting system was recently initiated in Myanmar.

## 7. HIV surveillance among TB patients – Experience from Thailand

The objectives of TB surveillance in all HIV prevalence settings in Thailand were:

- To inform the targeting of resources and the planning of activities for people with HIV and TB and for monitoring the effectiveness of these activities;
- To increase political, professional and civil society awareness of the situation;
- To assess the need for collaboration between HIV/AIDS and TB programmes on formulation and implementation of a joint TB/HIV strategy;
- To provide information on the HIV/AIDS epidemic and its impact on TB patients; and
- To quantify the needs for providing ART to TB patients.

The target by the end of 2005 was to have 100% of all TB patients enrolled in TB programmes receiving HIV counseling, and 75% of all persons newly diagnosed with HIV infection in centres providing voluntary counselling and testing (VCT) screened for TB.

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<sup>2</sup> STAR: Software Tool for Analysis and Reporting, a software package specifically designed for tuberculosis recording and reporting.

A new pilot project for diagnostic counseling and testing to increase HIV testing uptake was also started in 2006. The general objectives are to enhance the capacity of provincial staff on HIV surveillance, prevention and care services. Specific objectives include documentation of the lessons learned. The major difference between VCT and diagnostic counseling and testing is that the provider recommends the test as routine for anyone coming to the clinic.

## **8. Strengthening of routine surveillance**

### **Case study: India**

The RNTCP started in 1995 with the introduction of the DOTS strategy. Since then, the incidence of all forms of TB have been decreasing by 2.5% per year.

Each peripheral health centre sends a paper-based monthly report to the tuberculosis unit (TU) which then compiles the data from PHCs into a paper-based quarterly report which is forwarded to the district TB centre. The aggregated data from this level is forwarded to the State TB Cell and the Central TB Division electronically. Quarterly feedback is provided to each district TB centre from the State as well as from the central level. Hardware and other connectivity consist of computers with internet connection (one per district). Each district is provided with an email ID on the *tbcindia* server. EPICENTRE is the software programme used. Technical support personnel consist of one full time data entry operator per district, supervisors who supervise the sub-district level and a network of 120 national consultants. At the central level there is a team for data management and EPICENTRE software support.

Quarterly reporting involves 2432 TUs and 632 districts. Over the past few years, 100% reporting was achieved by districts and TUs. Reports are sent within 24 days of the completion of the quarter. The data for these reports are collected using various forms including TB laboratory register, TB treatment card, TB register, quarterly case finding report, quarterly sputum conversion report, quarterly treatment results report, programme management report and quarterly and annual performance reports, containing district-wise indicators.

A windows version of EPICENTRE has been developed and is currently being field-tested. This software application will have in-built, integral mapping and report output functions.

## 9. Group work – Analysing country data

The exercises carried out in the group work centred around the data set from national TB programmes over the past 10 years, and any additional data from special surveys available and published. Many techniques were presented for analysing and “fitting” explanations to the data and observations. Detailed templates including all data compiled from NTPs since 1995 in most cases and other analytic reports formed the basis for participants and facilitators to work in country groups with their own programme data, drawing analyses on age, sex, urban–rural or geographic variations in TB case notifications and treatment outcomes. The information emerging from these analyses were then discussed in terms of the next steps that might be taken by programmes to evaluate and improve the quality of their surveillance data or to target operational research or programme interventions to address the emerging issues.

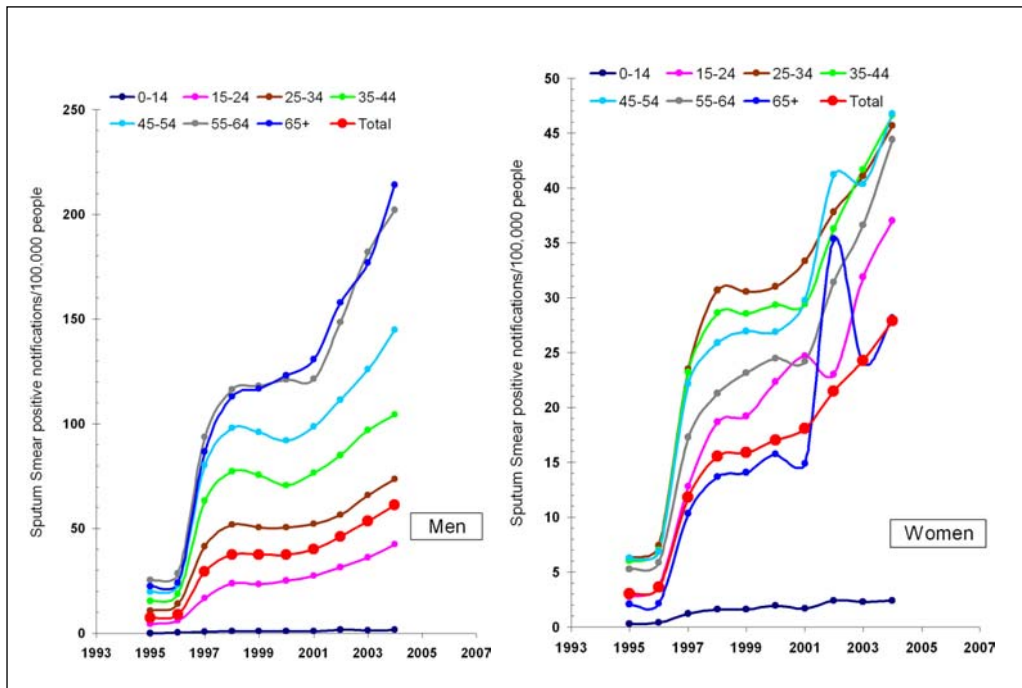
The key observations that emerged from these exercises were:

The case notification rates in **Bangladesh** increased steadily until 1997. From 1998 till 2001, the case notification rate showed a flat or even falling pattern, while it increased again after 2001. In most countries not badly affected by HIV, it is believed that the TB incidence is decreasing or may have flattened out. The striking increases seen in Bangladesh are almost certainly due to improved case finding. The first phase (increase) corresponds to the geographic expansion of the DOTS programme to achieve nationwide coverage in mid-1998. The second phase from 2001 onwards occurred after intensified collaboration with NGOs. Detailed analysis suggests that the observed variations are therefore due to changes in case finding and not a true rise in incidence.

Notification rates among men are clearly highest in the older age groups, while in women the peak reporting rates are in the younger and middle age groups. A predominance of men over women especially in middle age to older adults is also observed in other countries in the Region. However, the reported male to female ratio of 8:1 requires further analysis.

The long working hours in factories, particularly affecting access to services among young women, or cultural perspectives among older women may partially explain the difference. (see Figure 1).

**Figure 1:** Bangladesh: Trends in notification of sputum smear positive patients, 1995-2004



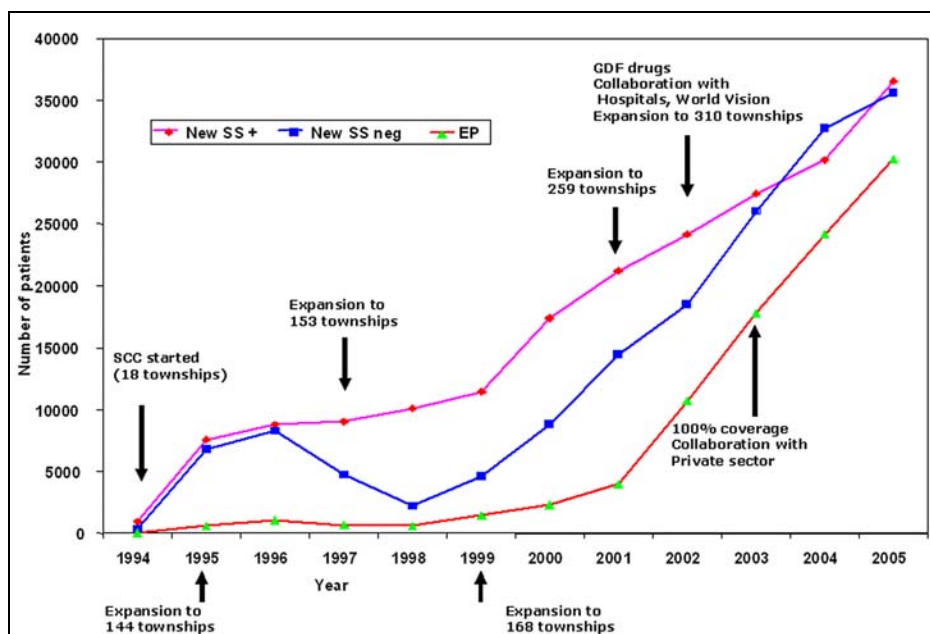
Source: Programme Data, National TB Programme, Bangladesh, 2006

The **DPR Korea** data showed a very rapid rise in notification rates and a recent decline of TB in people aged over 65 years. This demographic pattern needs to be studied carefully. The underlying demography is important since most of the deductions in TB epidemiology are based on rates with population denominators. It is important to make sure the population sizes with regard to age categories are correct.

High notification rates (all cases) are reported in the 45–54-year age group. This type of distribution was not seen before. This may point to cases being missed among the older or younger age groups.

**Myanmar** reports a generalized HIV epidemic. While this has been linked to an increased incidence of TB, the NTP needs to analyse the data to determine if the increase is limited to the areas and regions in the country with higher prevalence of HIV and is falling or stable elsewhere. Provinces in the north and east have relatively higher rates of HIV and the average age of TB patients has been noted to be lower. However, the increase in TB in younger people is not necessarily restricted to areas where HIV rates are high. Another finding was the disproportionately high number of cases with smear negative, extra-pulmonary TB and TB among children. Again, whether this is due to improved programme implementation, case reporting or a real increase in incidence needs to be determined (Figure 2).

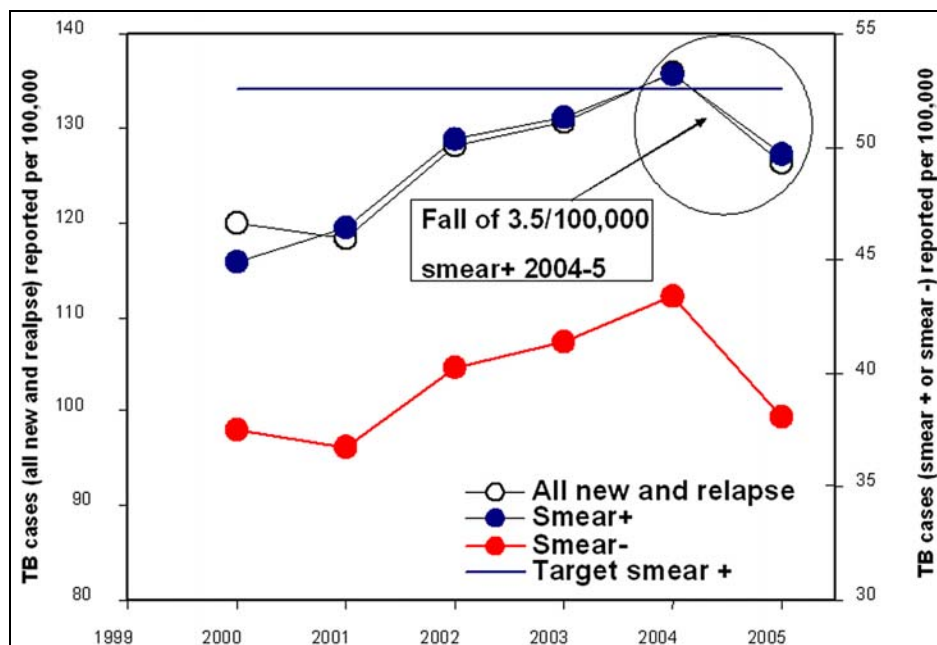
**Figure 2:** Myanmar: Trends in case detection, 1999-2003



Source: Programme Data, National TB Programme, Myanmar, 2006

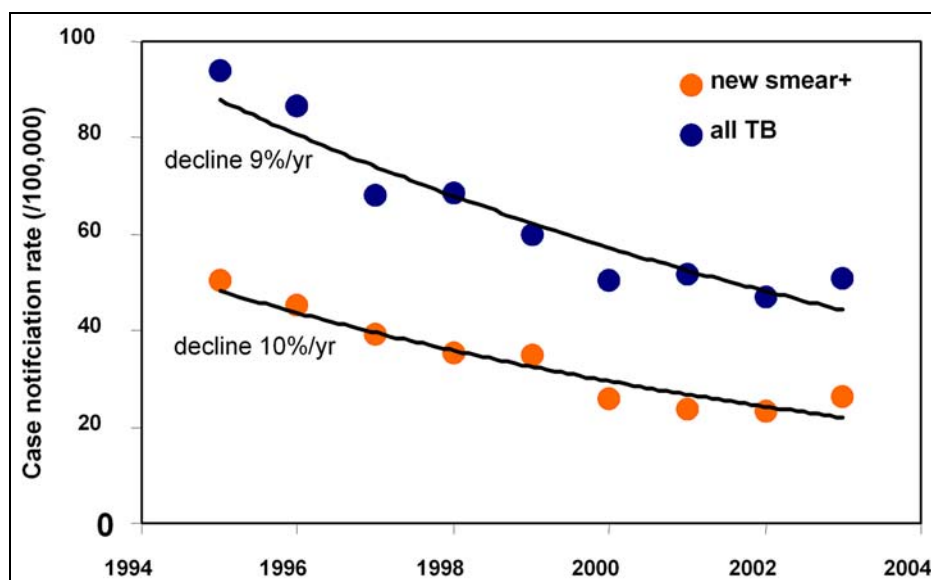
In **Bhutan**, there is disproportionately high notification of extra-pulmonary TB and a disproportionately low number of smear-negative pulmonary TB. **India** shows a decrease in case notification which may indicate lower case detection. This could be explained by the accelerated expansion into the most difficult districts and a decline in incidence in districts with a well established programme (Figure 3).

Figure 3: India: Trends in case detection, 1999-2005



Source: Joint Monitoring Mission Review, Revised National TB Control Programme, India 2006

Figure 4: Maldives: Decline in TB incidence, 1994-2004

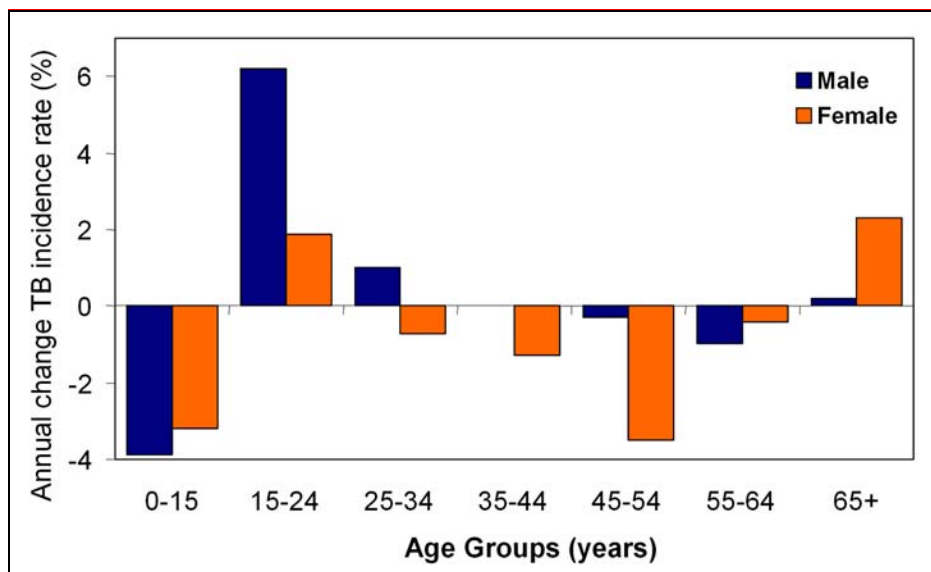


Source: Programme Data, National TB Control Programme, Maldives, 1994-2005

With regard to **Indonesia**, it is not clear if recent increments in case notifications are due to better data collection or because of improvements in case finding. A prevalence to incidence ratio of 1:1 is now suggested, which needs further interpretation. Either the estimated incidence is too high or the estimated prevalence is too low. Extra caution is required to interpret data in the **Maldives** as the numbers of cases are very small. The overall trend is consistently downward across all age groups but there are indications that the rate of decline has decreased from over 10% per year earlier to 1-2% currently (Figure 4).

In **Nepal**, case notifications are rather flat following the period of DOTS expansion, which may signify that case finding is good but that the incidence is apparently not decreasing. The data from **Sri Lanka** show a pattern of minimal change in overall case notification rates. However, close scrutiny reveals that the decrease in older age groups has been offset by a significant increase in the age group 15-24 years, particularly among males (Figure 5).

**Figure 5: Sri Lanka – TB incidence rates by age and sex**



Source: Programme Data, National Programme for TB Control and Chest Diseases, Sri Lanka

The data available from **Timor-Leste** is very limited to make meaningful comparisons with other countries.

## **10. Improving data management for TB**

### **10.1 Review of new recording and reporting formats**

The new Stop TB Strategy launched in the beginning of 2006 while building on the DOTS strategy includes a number of additional interventions. To capture progress in the implementation of the additional components of the new strategy, it was necessary to adapt the current recording and reporting formats. Some countries have already embarked on revising their data collection forms. Standardizing these forms is critical to continue to ensure that comparison of data over time and between different countries can be objectively undertaken. The changes in these new recording and reporting forms were displayed along with the rationale for the change or inclusion. The proposed new formats preserve the quarterly frequency of data collection and continue the use of aggregate information and cohort analysis. They also include relevant information on TB/HIV, diagnosis through culture and allow capturing information of referrals through public-private collaboration.

### **10.2 Electronic recording and reporting tools**

The Software Tool for Analysis and Reporting (STAR) was demonstrated. The software package is currently being piloted in two countries of the Region (Bangladesh and Myanmar). The STAR system is a Microsoft Access-based relational data base system with a flexible front-end approach so that evolving changes and country-specific changes to the interface can be configured quickly and easily. The advantage is that no major technical expertise is required to customize it for countries to include new data sets or changes in recording and reporting formats.

EPICENTRE<sup>3</sup>, the original DOS Epi-Info system, was demonstrated by India. A new Windows-based application has been developed and is currently being field-tested. This version has an integrated mapping software to enable map-based reports and analyses to be made in addition to the conventional reports and graphs used in monitoring and evaluation the TB programme.

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<sup>3</sup> EPICENTRE: acronym for Epi-info-based software to create and evaluate national tuberculosis reports

The advantages and disadvantages of the two software programmes were discussed and it was felt that all NTPs would benefit from a presentation on both STAR and the Windows-based EPICENTRE following rolling out of both software programmes in the three countries.

The National TB Institute also made a presentation on the use of hand-held devices for collection of data in the field, transmission via cell phone, receipt of feedback by the field workers on programme parameters and logistics.

## **11. Conclusions and recommendations**

### **11.1 Conclusions**

While substantial gains have been made in capturing data on cases notified and treatment outcomes under DOTS by national TB programmes, all TB control programmes need to improve their capacity to more accurately and easily compile, analyse and use this data to target programme interventions for better impact. Concurrent with strengthening routine surveillance, and until routine surveillance and national vital registration systems are robust enough to accurately reflect the true morbidity (prevalence and incidence) and mortality due to TB, consecutive surveys to establish TB prevalence and mortality need to be undertaken to monitor and report on progress towards the TB targets set under the MDGs. The modalities for these, however, vary and the use of one or the other modality will necessarily depend on the country situation, cost and complexity.

The new recording and reporting format has been developed to capture data on the additional components of the new Stop TB strategy such as the contribution to cases notified and treated from private and other public providers, information relating to HIV co-infection and drug resistance. The next steps are to further improve recording and reporting including developing links with national vital registration or health management information systems, and usage of software programmes at the appropriate levels within countries, to better analyse age, sex, urban-rural or other variables in TB case notifications and treatment outcomes. The information emerging from these analyses can then better inform programmes to evaluate and improve the quality of their surveillance data, target operations research or programme interventions to address the emerging issues.

## **11.2 Recommendations for National Tuberculosis Programmes**

- Ensure that the national five-year plans set clear targets for reducing the burden of TB, guided by the MDGs. Plans should comprehensively cover activities and budgets required to strengthen surveillance and undertake any planned surveys. Proposals should be submitted to obtain necessary funding and include the costs required for these activities;
- Strengthen capacity to improve current surveillance mechanisms including effective use of data management software and effectively analyse routinely collected national and sub-national data towards using these data to establish trends, measure impact and target programme interventions more effectively;
- Use concurrent national health information systems including national vital registration (VR) systems to further strengthen programme surveillance. Reports of TB deaths in NTP cohorts should be compared with TB deaths registered by VR under ICD-10<sup>4</sup> and further supported through operational research studies and verbal autopsies;
- Collaborate more closely with national HIV/AIDS programmes to improve joint surveillance to better evaluate the impact of HIV on the TB incidence, prevalence and mortality;
- Undertake operational research that will help to further define emerging trends and support the development of targeted interventions.

## **11.3 Recommendations for WHO and partners**

- Develop tools and guidelines to assist Member countries in evaluating the quality and strengthening of TB (including TB/HIV and drug-resistance) surveillance in countries, including assistance to establish effective data management systems for recording and reporting by National Tuberculosis Programmes;
- Develop guidelines and assist in building capacity through training and maintaining a roster of consultants to provide technical assistance to Member countries in order to systematically analyse routinely

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<sup>4</sup> ICD-10: international classification of diseases, tenth edition

collected programme data, to better understand emerging trends and to develop targeted programme interventions;

- Develop standard protocols and guidelines to assist Member countries to undertake population-based representative surveys/studies, to establish sound baselines and measure trends in TB case detection, treatment success, incidence, prevalence and mortality;
- Advise Member countries on operational research priorities related to TB surveillance and monitoring and assist in promoting and implementing operational research activities, particularly those related to better analysing and using data from routine surveillance;
- Closely monitor trends in the TB epidemic including impact assessments, in Member countries, using surveillance and survey data to support advocacy and resource mobilization efforts for TB control efforts in the Region.

## **Annex 1**

# **Programme**

### **28 August 2006**

- Inaugural session
- Update on the burden of TB in the SEA Region and Globally
- Framework for measuring progress towards the MDGs
- Review of methods for measuring progress towards the MDGs
- Better assessing TB incidence, prevalence and mortality at country level – Experience from countries (India, Indonesia, Myanmar)
- HIV surveillance among TB patients – Experience from Thailand

### **29 August 2006**

- Strengthening routine surveillance – a case study: India
- Group work: Analysing country data

### **30 August 2006**

- Review of the new recording and reporting formats
- EPICENTRE in India
- STAR
- Group work: preparation of outline country plans (2006-2015) for further improving surveillance and monitoring of TB incidence, prevalence and mortality

### **31 August 2006**

- Group work: preparation of outline country plans (2006-2015) for further improving surveillance and monitoring of TB incidence, prevalence and mortality (cont.)
- Presentation of group work
- Discussions
- Closing session

## Annex 2

### List of participants

#### Country participants

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## Annex 3

## Summary table identifying country needs for strengthening surveillance, monitoring and evaluation systems

Country	Surveillance	Survey	External TA required	Other TA Partners
<b>Bangladesh</b>	To improve recording, reporting and compilation of data.	ARTI survey.  To establish a baseline survey (by 2009).	WHO	NGOs
<b>Bhutan</b>	To refine TB information system by revising the current recording and reporting system (by 2 <sup>nd</sup> quarter of 2007).	ARTI survey (by end of 2007).  Evaluation of suspected MDR TB (by end of 2007).	WHO	
<b>DPRK</b>	Revision of recording and reporting forms; computerization at central level (by March 2007).  Computerization at county level (71 counties) (by Oct. 2007).  Computerization at county level (142 counties) (by April 2008).  Computerization at country level (213 counties) by Oct. 2008).	ARTI surveys in three provinces in 2010-2011.	STC to assist setting up a computerized data base and to strengthen data analytical capacity at the central & provincial levels in early 2007.  STC for PPD, standardization of tuberculin readers.	

Country	Surveillance	Survey	External TA required	Other TA Partners
<b>India</b>	<p>National roll-out of EPICENTRE to be completed by mid-2008.</p> <p>Enhancing data management capabilities at district/state/central level.</p> <p>Training of trainers and planned roll-out of training.</p> <p>Electronic patient-based information for DOTS-Plus cases (piloting and operationalization): early 2007.</p>	<p>Surveys in 6 sites (completed by 2010).</p> <p>Repeat survey using protocols used in earlier surveys to facilitate easy comparison.</p> <p>Tuberculin testing baseline data information available (to be completed by 2010).</p>		
<b>Indonesia</b>	<p>M&amp;E officer.</p> <p>Improvement of electronic TB software.</p> <p>Socialization with electronic TB software.</p> <p>Improvement of supervisor skills of TB Wasor at the provincial level.</p> <p>Biannual M&amp;E national meeting and quarterly M&amp;E meeting.</p> <p>Analysis and feedback from central level.</p> <p>Inclusion of surveillance data as feedback in <i>Gerdunas</i> newsletter.</p> <p>Uploading of surveillance data on TB website as feedback to partners.</p> <p>Update provincial profiles and upload on TB website to facilitate access to all.</p>	<p>Tuberculin survey in three epidemiological zones.</p> <p>TB mortality study piggy-backed on IMRSSP<sup>5</sup> in six provinces initially and expand later.</p> <p>TB/HIV sero-prevalence study in six provinces.</p> <p>Repeat national TB prevalence study in 2010.</p>	<p>In-country TA for improvement of surveillance.</p> <p>TA to improve TB electronic software.</p> <p>TA to improve tools and evaluation to enhance the skills at central, provincial and district levels.</p> <p>TA to improve GIS for production of provincial profiles.</p> <p>TA for surveys.</p>	

<sup>5</sup> IMRSSP: Indonesian Mortality Registration Strengthening System Project

Country	Surveillance	Survey	External TA required	Other TA Partners
<b>Maldives</b>	Set-up an excel-based TB database in the central office (by 2008).	Measure the duration of disease for better assessment of the prevalence.	Electronic nominal reporting system (as used in countries of the WHO Eastern Mediterranean Region) for the database.  Consult WHO or the Japanese Anti-TB Association for the questionnaire used to investigate the duration of disease (or delay).	
<b>Myanmar</b>	Computerized recording and reporting system using STAR (by 2007-08).  Establish mortality database system linked with existing vital registration (by first quarter 2007).	Continuation of point prevalence survey in remaining parts of the country (by 2008). Repeat time point prevalence survey (disease & infection) in 2013-14.	WHO, JICA, JATA, UNICEF	
<b>Nepal</b>	Strengthening of data management system using EPICENTRE (by mid-2007).	Mortality (case-fatality rate) from observation on patient cohorts (by 2008).	WHO	Consultation with experts from India
<b>Sri Lanka</b>	Developing and updating software (by 2007).  On-going supervision.  On-going review meetings.  Developing a cross-recording and reporting in HIV/TB (by 2007).  External Review (4 <sup>th</sup> quarter 2006, 2009, 2012).	Tuberculin survey (by 2007). Drug-resistance survey (by 2010-2011).	External TA for external review.	
<b>Thailand</b>	Epidemiological situation analysis. Electronic recording and reporting system. Strengthening supervision, monitoring and evaluation in large hospitals (all by 2008).	To be decided.	No TA required for surveys	International TB experts (epidemiologists, advocacy, human resource development).

Country	Surveillance	Survey	External TA required	Other TA Partners
<b>Timor-Leste</b>	Develop regional supervision and monitoring plan. Training. Implementation of a coordinated monitoring and supervision plan at the central and district levels. Quarterly reporting and follow-up of new smear- positive TB cases registered under DOTS successfully treated. Quality control (all by 2008)	To be decided	None Specified	None Specified