

2005 Report

Tuberculosis Control

in South-East Asia and
Western Pacific Regions

A Bi-Regional Report



World Health Organization
South-East Asia Region Western Pacific Region



TUBERCULOSIS CONTROL

in South-East Asia and
Western Pacific Regions
2005

A Bi-Regional Report



World Health Organization
South-East Asia Region Western Pacific Region

This publication was prepared by Stop TB Units in the WHO Regional Offices for South-East Asia (SEARO) and the Western Pacific (WPRO), in collaboration with Asheena Khalakdina, Erwin Cooreman and Nani Nair in SEARO, and Philippe Glaziou, Bernard Tomas, Pieter van Maaren and Dongil Ahn in WPRO.

Acknowledgements

The contribution of NTP managers and statisticians from all countries and areas of the South-East Asia and Western Pacific Regions for providing data for this publication is gratefully acknowledged.

WHO Library Cataloguing in Publication Data

Tuberculosis control in South-East Asia and Western Pacific regions 2005 : a biregional report.

1. Tuberculosis, Pulmonary -- epidemiology.
2. Tuberculosis, Pulmonary -- prevention and control.
3. Tuberculosis, Pulmonary -- drug therapy.
4. Directly observed therapy -- utilization.
5. South-East Asia.
6. Western Pacific.

ISBN 92 9061 196 0 (NLM Classification: WF 200)

© World Health Organization 2005

All rights reserved.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The World Health Organization does not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use.

Publications of the World Health Organization can be obtained from Marketing and Dissemination, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel: +41 22 791 2476; fax: +41 22 791 4857; email: bookorders@who.int). Requests for permission to reproduce WHO publications, in part or in whole, or to translate them – whether for sale or for noncommercial distribution – should be addressed to Publications, at the above address (fax: +41 22 791 4806; email: permissions@who.int). For WHO Western Pacific Regional Publications, request for permission to reproduce should be addressed to Publications Office, World Health Organization, Regional Office for the Western Pacific, P.O. Box 2932, 1000, Manila, Philippines, Fax. No. (632) 521-1036, email: publications@wpro.who.int

Contents

Foreword	v
Executive Summary	vii
1. Introduction	1
2. Epidemiology	3
2.1 Estimated Burden	3
2.2 Case Notification	4
Notifications	4
Notification rates	5
Age- and sex-specific notification rates	6
2.3 TB-HIV	6
2.4 Drug Resistance	8
3. Progress in TB Control	11
3.1 DOTS Coverage	11
3.2 Case Detection	11
3.3 DOTS Enrolment and Progress in Overall Case detection	13
3.4 Treatment Outcomes	13
3.5 Treatment Results of Re-treatment Cases	15
4. Grouping of Countries	17
4.1 High Burden Countries	17
4.2 Low and Intermediate Burden Countries	20
High income countries	20
Countries with emerging economies	22
Island countries	24
5. WHO'S WORK	27
5.1 WHO's Work in the Regions	27
Providing timely and effective technical support	28
Capacity strengthening	28
Effective coordination and information exchange	29
Strengthening partnerships and mobilizing resources for TB Control	29
Monitoring and evaluation	30
Operational research	30
Annexes	
1. Definitions	45
2. Formulas for estimating tuberculosis incidence, prevalence and deaths	48
3. Statistical Methods	49

List of Figures

Figure 1: Trends in case notification rates (all forms), 1995 - 2003	6
Figure 2: Case-notification rates of smear-positive cases, 1995-2003	7
Figure 3: Smear-positive notification rates, by age and sex	7
Figure 4: DOTS coverage 1997-2003 in South-East Asia and Western Pacific Regions	11
Figure 5: Trends in DOTS case detection rates in South-East Asia and Western Pacific Regions 1995-2003.	12
Figure 6: Trends in DOTS and non-DOTS case-detection rates (new smear-positive cases) in the South-East Asia and Western Pacific Regions.....	13
Figure 7: Treatment outcomes for new smear-positive cases registered in 2002 in DOTS and non-DOTS areas in SEA and WP Regions	14
Figure 8: Unfavourable outcomes among new smear-positive cases registered in 2002 in DOTS areas in South East Asia and Western Pacific Regions	14
Figure 9: Treatment outcomes for re-treatment cases registered in 2002 (DOTS areas)	15
Figure 10: Trends in DOTS and non-DOTS case-detection rates (new smear-positive cases) in China, India, Indonesia and Viet Nam	18
Figure 11: Age-specific smear-positive notification rates per 100 000 population in China, India and Indonesia	18
Figure 12: Age-specific smear-positive notification rates per 100 000 population in several high-burden countries in South-East Asia and Western Pacific Regions	19
Figure 13: Progress of DOTS towards targets in high-burden countries in South-East Asia and Western Pacific countries	19
Figure 14: Age-specific case-notification rates per 100 000 population in Malaysia, Republic of Korea, Singapore and Japan	21
Figure 15: Age-specific notification rates, 2003	23

List of Tables

Table 1: Estimated prevalence rates (all cases) and death rates per 100 000 from TB in the South-East Asia and Western Pacific Regions	4
Table 2: Notification rates and other indicators for the South-East Asia and Western Pacific Regions, 2003 (per 100 000 population)	5
Table 3: Estimated prevalence of HIV in new TB cases and estimated incidence of TB in HIV-positive adults aged 15-49 years	8
Table 4: Deaths due to TB in HIV-positive patients for countries with high TB/HIV burdens	9
Table 5: Anti-tuberculosis drug resistance, by country	10
Table 6: DOTS case detection rates of all forms and smear-positive (SS+) cases in 2003	12
Table 7: Annual rate of change in notification and case-detection rates (all cases) in middle to high-income countries	21
Table 8: Case-notification rates, case-detection rates and rate of change, 1999-2003	23
Table 9: Progress with DOTS in 2003	24

Foreword

Tuberculosis (TB) remains to be one of the most serious health and development problems in the WHO South-East Asia and Western Pacific Regions, which together carry more than half of the global tuberculosis burden. Every year millions of people are newly infected with the TB bacillus, and thousands die of the disease in these two most populous regions of the world. The spread of the human immunodeficiency virus (HIV) during the last two decades and the emergence of multidrug-resistant forms of TB pose additional challenges to effective TB control.

This year is a landmark for TB control. Five years ago, the World Health Assembly resolved to achieve the global targets of 70% case detection and 85% cure rate among all new infectious cases of TB by 2005. In addition, the Millennium Development Goals have set a new benchmark for further reversing the trends of TB and other major communicable diseases.

Member States are accelerating their efforts to meet these goals. DOTS, the internationally recommended strategy to control tuberculosis, is proving to be successful in many countries. We are happy to note that nearly 90% of people in our regions have access to care under this highly effective strategy. Over 2.2 million cases are managed under DOTS in the two regions each year. Of these, 85% are being successfully treated, averting over 320 000 deaths.

The growing number of patients cured of this debilitating and often fatal disease reflects the success of our interventions. This progress is largely an outcome of the sustained commitment on the part of governments, health workers and civil society.

This publication is the first bi-regional report on tuberculosis control in the South-East Asia and the Western Pacific Regions. It presents data on TB epidemiology and gauges the enormous progress being made by national TB control programmes in both the regions. It presents the overall success with strategies adopted to control TB and highlights the similarities and differences between individual countries.

This progress needs to be sustained and built upon to enable individual countries and the two regions to achieve the targets set under the Millennium Development Goals. This requires continued commitment and adequate support of national TB control programmes for several years to come.



Shigeru Omi, M.D., Ph.D.
Regional Director
WHO Western Pacific Region



Samlee Plianbangchang, M.D., Dr.P.H.
Regional Director
WHO South-East Asia Region

Executive Summary

This is the first bi-regional report on TB control for the WHO South-East Asia and Western Pacific Regions. It includes data on the estimates of disease burden, case notifications and treatment outcomes reported from 47 countries in the two regions of WHO in 2003.

Tuberculosis is still a major public health problem in both the regions. In 2003, there were an estimated 9.7 million prevalent cases of TB (291 per 100 000 population) in the South-East Asia and Western Pacific Regions, of which almost 5 million were new cases (149 per 100 000 population). Six countries account for about 90% of the total estimated new cases in the two regions. China and India accounted for 63% of incident TB cases (all forms) in the two regions.

The global HIV epidemic has had an impact in countries in Asia and the Pacific: the prevalence of HIV among TB cases was 12% in Cambodia and Thailand, 6.8% in Myanmar and 4% in Viet Nam. In addition, drug resistance was found in almost all settings surveyed in the South-East Asia and Western Pacific Regions; the prevalence of MDR-TB varied widely across settings ranging from 0.5% to 10.4%. The highest prevalence rates of MDR-TB in previously untreated cases were observed in Liaoning (10.4%) and Henan (7.8%) provinces in China.

The case-detection rate in the two regions (see Annex 1 for definition) was 51% for all tuberculosis cases and 50% for new smear-positive cases. In other words, the 2.5 million notified cases (all types) represented 51% of the 5 million estimated cases (all types) and the 1.1 million notified new smear-positive cases represented 50% of the estimated new smear-positive cases.

Case detection rates in DOTS areas have been steadily increasing in the South-East Asia Region since 1998 whereas progress in the Western Pacific Region was relatively slow until 2002. The rise in case detection in the South-East Asia Region is largely due to significant increments in the numbers of cases detected in India (+52%), particularly between 2002 and 2003. Similarly, the increase in case detection in the Western Pacific Region from 2002 to 2003 (+28%) is mostly due to a dramatic increase in case detection in China (+59%). Progress in these two countries with the highest burdens of tuberculosis globally will necessarily drive global progress in TB control.

In DOTS areas, the treatment cure and success rates were 82% and 88% respectively for the cohort of 790 916 new pulmonary smear-positive cases registered for treatment in 2002 (85% and 81% respectively in the South-East Asia Region; 91% and 84%, respectively in the Western Pacific Region). In total, 23 countries out of 45 reported treatment outcomes below the 85%

WHO target (five in the South-East Asia Region, including three high burden countries¹ (Bangladesh, Myanmar and Thailand) and 18 in Western Pacific Region, including two high burden countries² (Lao PDR and Papua New Guinea).

Several challenges need to be overcome to sustain the momentum towards reaching the global TB control targets set for end-2005. With DOTS expanding rapidly, ensuring high quality DOTS implementation has become an important concern. Also, TB associated with HIV co-infection and multidrug-resistant TB need to be addressed by implementing collaborative TB-HIV activities and expanding DOTS-plus programmes designed to treat those with drug-resistant forms of TB.

Given that tuberculosis has implications not only on health but also on the social and economic development the achievement of several other targets under MDGs will also depend on good TB control. This makes it all the more imperative that commitment and resources are sustained to ensure that well-managed DOTS programmes continue to effectively reach out to all those affected by TB.

¹ Countries with a high burden of tuberculosis in the South-East Asia Region belong to the global list of 22 high burden countries: Bangladesh, India, Indonesia, Myanmar and Thailand.

² Seven countries in the Western Pacific Region are considered to have a high burden of tuberculosis: Cambodia, China, Lao PDR, Mongolia, Papua New Guinea, the Philippines, Viet Nam.

Introduction

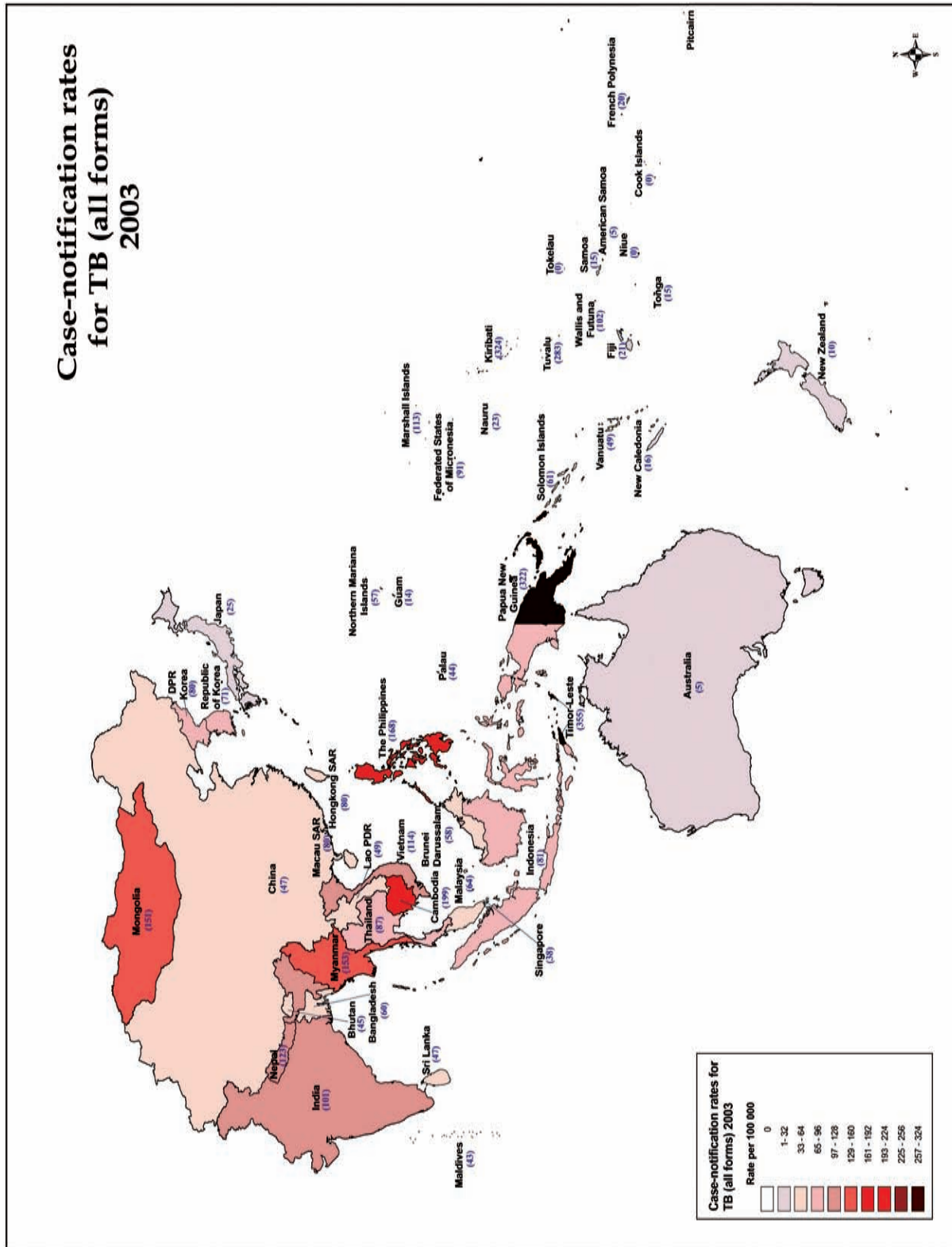
The WHO South-East Asia and Western Pacific Regions cover a vast geographic area with over 60% of the world's population in 48 countries and areas. Of these 47 reported data on TB to WHO in 2003.

During 2004, a standard form for reporting surveillance data was sent to all 48 countries and areas in both regions. Information was collected about the number and types of TB cases notified in 2003, on the outcomes of treatment among smear-positive and smear-negative as well as retreatment smear-positive cases registered in 2002, and about policies and practices in use for TB control. Also, data from drug resistance and TB-HIV surveillance were compiled.

Tuberculosis was declared a "global emergency" by WHO over a decade ago not only because of its toll on the health of individuals but also because of its wider social and economic impact on overall development. Targets were established to measure progress with implementation of the DOTS strategy to combat tuberculosis by 2005. These targets include 100% population coverage with DOTS, 70% case detection and 85% treatment success rate. Achieving these targets is an important intermediate step towards reaching the UN Millennium Development Goal (MDG) of halting and starting to reverse the incidence of TB by 2015. Since 2000, the WHO South-East Asia and Western Pacific Regions have achieved significant progress. A total of 45 of 48 countries in the regions are implementing DOTS, with the coverage reaching 84% at the end of 2003 (77% in the South-East Asia Region and 90% in the Western Pacific Region). The two regions have already achieved the treatment success rate target in DOTS areas and are now moving rapidly to achieve the 70% case-detection target.

Every year, the WHO Regional Offices for South-East Asia and the Western Pacific have separately published an annual TB report to share current knowledge on the state of the TB epidemic in each region. This bi-regional report is the first combined report on tuberculosis in the two regions. Its primary aim is to present data on TB epidemiology and related information reported from national TB control programmes (NTPs) to WHO in the two regions. It highlights the similarities and contrasts between the countries in the two regions and the overall strategies that have been adopted to address TB.

Case-notification rates for TB (all forms) 2003



Source: WHO, SEARO/PRO
 Disclaimer: The boundaries shown on the above map do not imply official endorsement or acceptance by the World Health Organization.

Epidemiology

This report is based on case notifications for 2003 and treatment outcomes for patients registered in 2002 reported by national TB control programmes to the World Health Organization in 2004, using standard data collection forms, with common definitions and variables (Annexes).

2.1 Estimated burden

Estimates of TB prevalence, incidence and mortality in countries are based on a consultative and analytical process that takes into account all available information on case notifications; prevalence of infection and disease; tuberculin surveys; duration of illness; proportion of smear-positive cases; numbers of cases treated and remaining untreated; HIV prevalence and incidence; mortality and demography. The estimates of disease burden are revised annually by WHO to reflect new information gathered through surveillance and from special studies such as prevalence and annual risk of tuberculosis infection (ARTI) studies conducted in countries. For instance, a national sample survey for ARTI, recently completed in India³, was used in these calculations. The estimates are also applied to previous years, retrospectively, when necessary. The estimated figures are WHO provisional estimates published in the WHO Report 2005–Global Tuberculosis Control. The methodology used for case estimates was that described in detail in the “Global Burden of Tuberculosis”⁴, published in 1999, and “The Growing Burden of Tuberculosis”⁵, published in 2003. Methods used to study the tuberculosis epidemic are also described in “Tuberculosis: Epidemiology and Control”⁶.

In all measurements of TB indicators, population estimates provided by the UN Population Division⁷, are used, recognizing that these sometimes differ from population data in the countries themselves (many of which are based on more recent survey data).

In 2003, there were an estimated 9.7 million prevalent cases of TB (291 per 100 000 population) in the South-East Asia and Western Pacific Regions, of which almost 5 million were

³ National Tuberculosis Institute, DGHS, India, Annual Risk of Tuberculosis Infection in Different Zones of India: A national sample survey 2000-2003.

⁴ Dye C, Scheele S, Dalin P et al. Global Burden of Tuberculosis. Estimated Incidence, Prevalence, and Mortality by Country. *JAMA* 1999; 282: 677–686.

⁵ Corbett EL, Watt CJ, Walker N et al. The Growing Burden of Tuberculosis. Global Trends and Interactions With the HIV Epidemic. *Arch Int Med* 2003; 163(9): 1009-1021.

⁶ Kumaresan, J. *Epidemiology in Tuberculosis: Epidemiology and Control* (Jai P. Narain, ed), World Health Organization, Regional Office for South East Asia, 2002 (SEA/TB/248)

⁷ <http://esa.un.org/unpp/>, accessed January 2005.

new cases (149 per 100 000 population). China and India accounted for 63% of all incident TB cases (all forms) in the two Regions.

It was estimated that 944 073 deaths from tuberculosis occurred in both regions in 2003 (617 211 and 326 862 in the South-East Asia and Western Pacific Regions, respectively), i.e. 28 deaths from tuberculosis per 100 000 population (38 and 19 in the South-East Asia and Western Pacific Regions, respectively). The death rate from tuberculosis per 100 000 population was highest in Timor-Leste (96) and Cambodia (95) as compared to 33 in India and 18 in China.

Table 1 shows the rates of change in the estimated prevalence and death rates from 1990 to 2003.

Table 1: *Estimated prevalence rates (all cases) and death rates per 100 000 from TB in the South-East Asia and Western Pacific Regions*

	1990	2003	Overall change (%)	Yearly rate of change (%)
Prevalence				
South-East Asia	570	351	-38	-4
Western Pacific	341	236	-31	-3
Total	446	291	-35	-3
Deaths				
South-East Asia	50	38	-24	-2
Western Pacific	26	19	-27	-2
Total	37	28	-24	-2

The estimated prevalence and death rates decreased in both regions at an overall yearly rate -3% and -2%, respectively in South-East Asia and the Western Pacific.

2.2 Case Notification

Notifications

The population coverage with DOTS was 77% in the South-East Asia Region and 90% in the Western Pacific Region in 2003, with a combined coverage of 84% in the two Regions⁸.

The two regions together detected 58% of the total number of cases detected globally, 23% in the Western Pacific and 35% in South-East Asia. These two regions account for approximately 2.5 million cases of all forms of tuberculosis notified (1.5 million in South-East Asia and almost 1 million in the Western Pacific) and about 1.1 million notified cases of smear-positive tuberculosis (672 878 in the South-East Asia Region and 454 732 in the Western Pacific Region) in 2003. The largest number was from India with over 1 million cases (433 271 smear-positive cases) and China with 615 868 cases (267 414 smear-positive cases). Together, these two countries alone accounted for 40% of all reported tuberculosis cases and 37% of all smear-positive cases reported globally.

⁸ Population coverage at the end of 2004 in excess of 90% in both regions (unpublished data from NTP annual reports 2004)

Of all TB case notifications, 86% of all TB cases and 92% of smear-positive tuberculosis cases were reported from DOTS areas. These proportions were slightly higher for the Western Pacific Region: 89% and 95%, for all and smear-positive cases respectively, compared to the South-East Asia Region where these were 85% and 91% respectively.

Notification rates

The combined case notification rate per 100 000 population in the South-East Asia and Western Pacific Regions was 76 for 2003 (Table 2). In South-East Asia the notification rates were higher than for the Western Pacific with a total case rate of 96 (42 per 100 000 for smear-positive) compared to 57 in the Western Pacific (26 per 100 000 for smear-positive).

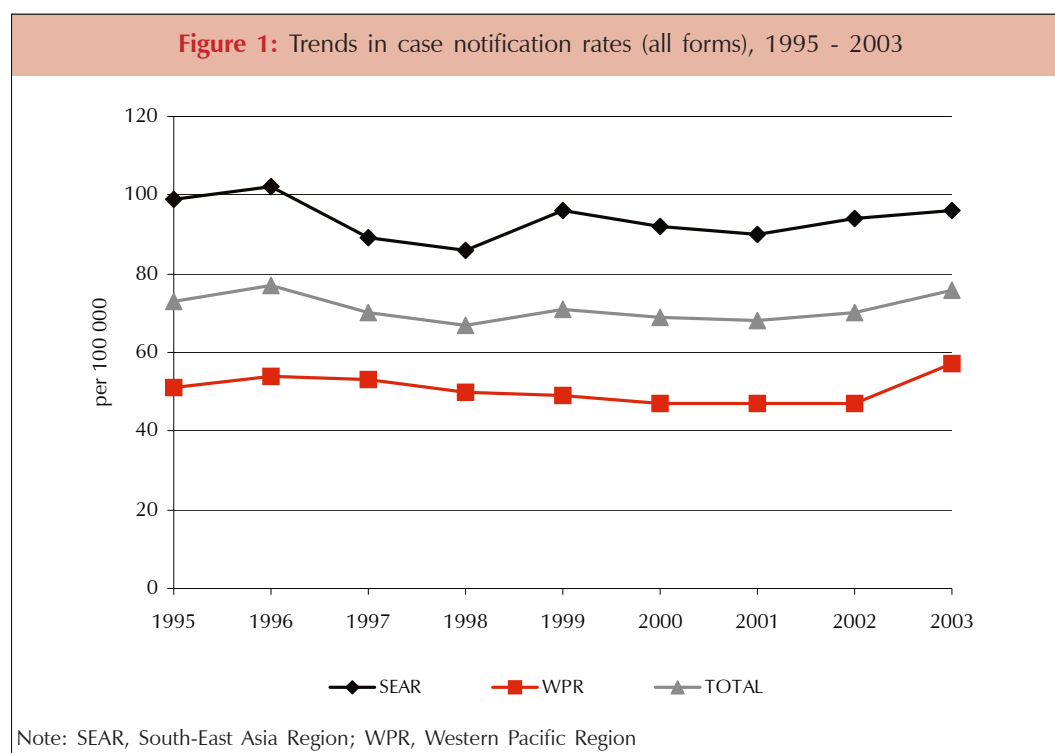
The notification rate for all cases in both regions has been steady since 1995 with the South-East Asia Region having a higher rate (range: 86 and 102 per 100 000) than the Western Pacific

Table 2: Notification rates and other indicators for the South-East Asia and Western Pacific Regions, 2003 (per 100 000 population)

		South-East Asia	Western Pacific	Total
Population (thousands)		1 614 648	1 732 104	3 346 752
Case Notifications				
All TB cases (number)	Overall ^a	1 555 385	987 927	2 543 312
	DOTS	1 314 983	879 827	2 194 810
All TB cases (rate)	Overall	96	57	76
	DOTS	81	51	78
New TB cases				
Number smear positive(SS+)	Overall	672 878	454 732	1 127 610
	DOTS	610 079	431 396	1 041 475
Rate (new SS+)	Overall	42	26	34
	DOTS	38	25	37
Smear negative or unknown		636 706	376 679	1 013 385
Extra pulmonary		180 865	70 506	251 371
Re-treatment cases				
Relapse		64 936	85 982	150 918
Treatment after failure		14 649	998	15 647
Treatment after default		64 217	1 208	65 425
Other retreatment		42 288	67 709	109 997
Other		10 428	7 008	17 436
Detection Rate				
All cases detection rate (%)		51	51	51
New SS+ detection rate (%)		49	52	50
Pop coverage (%)		77	90	84
DOTS Detection Rate (%)		45	50	47
Non-DOTS all cases		240 402	108 100	348 502
Non-DOTS SS+		62 799	23 336	86 135

Includes both DOTS and Non-DOTS

Region (range: 47 and 57 per 100 000). After a slight but steady decline since 1996, the Western Pacific Region has experienced a more rapid increase in the notification rate from 47 to 57 per 100 000 between 2002 and 2003. The South-East Asia Region has shown a slow decline in notification rates, followed by a slow increase since 2001, from 90 to 94 per 100 000. (Figure 1)



Case-notification rates for smear-positive cases however, have been rising steadily in the South-East Asia Region since 1998, from 25 to 42 per 100 000, after being steady between 1995 and 1998 at around 25 per 100 000. In contrast, the smear-positive notification rate for the Western Pacific Region has been steady between 1997 and 2002 at 22 per 100 000. A comparative increase in the smear-positive notification rate has been made since then to 26 per 100 000. (Figure 2)

Age- and sex-specific notification rates

The age- and sex-specific notification rates for the two regions for 2003 (Figure 3) show that the South-East Asia Region has higher rates for both men and women than the Western Pacific Region. Overall the highest rates are among men aged 15 to 64 years in the South-East Asia Region. In contrast, males in the Western Pacific Region have lower rates overall and display an upward trend in the higher age-groups indicating a shift in the epidemiology of tuberculosis. For females, the pattern is similar to that of males in the respective regions, albeit less dramatic than the trend seen in males. Females in the SEA Region have higher notification rates which are however lower in the higher age groups, compared to females in the Western Pacific Region who have lower rates overall and a slightly increasing rate in the 45+ age groups.

2.3 TB-HIV

The HIV epidemic has reached a generalized stage at the national level in only three countries in the two regions: Cambodia, Myanmar and Thailand. In Cambodia the prevalence of HIV infection

Figure 2: Case-notification rates of smear-positive cases, 1995-2003

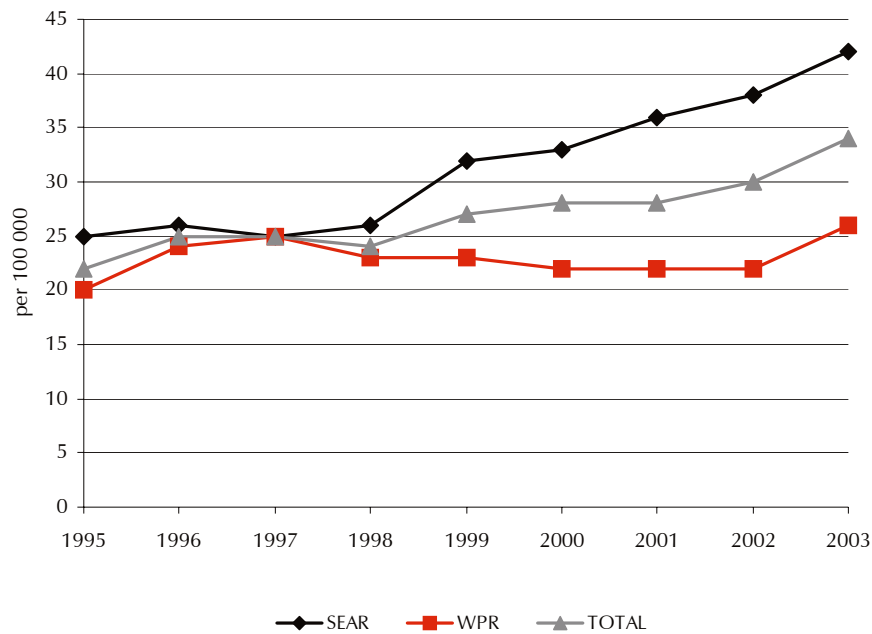
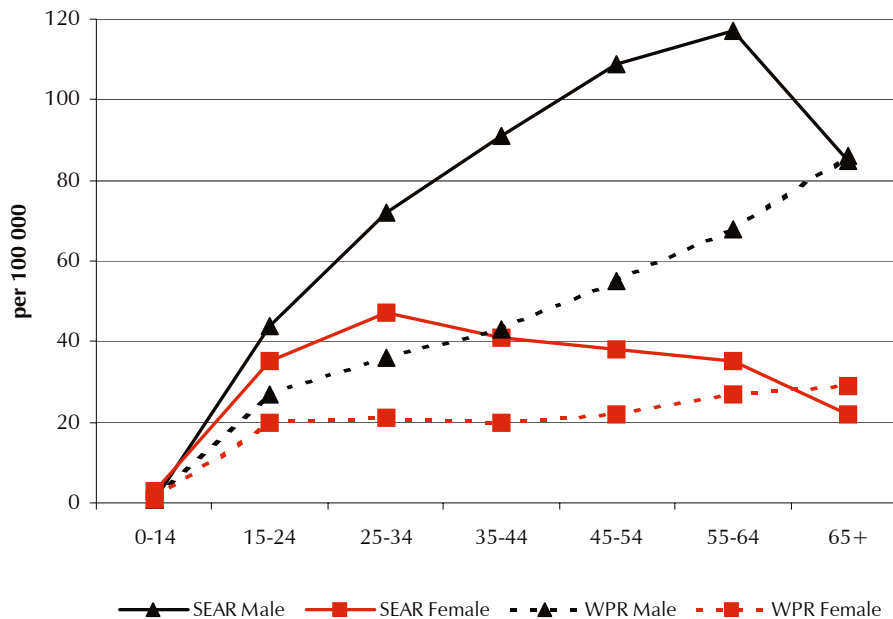


Figure 3: Smear-positive notification rates, by age and sex



among those aged 15 to 49 years was estimated to be 2.6% in 2003, in Myanmar the prevalence was 1.2% and in Thailand the prevalence was 1.5%. In addition, the epidemic is generalized in six states of India. In other countries affected by HIV⁹, particularly in China, Indonesia, Nepal and Viet Nam, the HIV epidemic is still at the concentrated stage. In China, HIV prevalence data

⁹<http://www.who.int/GlobalAtlas/PDFFactory/HIV/index.asp>, accessed February 2005

indicate a focused, explosive spread of infections among intravenous drug users (IDUs) and no significant spread to the non-IDU population. Although HIV/AIDS cases have been detected in all provinces, HIV transmission is focused primarily among IDUs in certain provinces. In Viet Nam, the prevalence is highest among IDUs (24% in 2000) but sexual transmission of HIV is increasing among female sex workers.

Tuberculosis is the most important life-threatening opportunistic infection associated with HIV. In Thailand, 60% of AIDS patients have had pulmonary tuberculosis. This was 80% in Myanmar, 56% in India and 75% in Nepal¹⁰.

Table 3 shows the estimated prevalence of HIV among TB cases and incidence of TB among HIV-positive adults in countries with a high TB/HIV burden in the two regions. The overall estimated HIV seropositivity among new adult TB cases is 3.5% in the South-East Asia Region and 1.2% in the Western Pacific Region. The three-fold higher proportion in South-East Asia could be attributed primarily to the high burden in India.

Table 3: *Estimated prevalence of HIV in new TB cases and estimated incidence of TB in HIV-positive adults aged 15-49 years^a*

	Prevalence of HIV in new adult TB cases Percentages ^b	Incident cases of TB (all forms) in HIV+ adults (thousands) ^c
Cambodia	13	6.5
China	0.7	5.8
Myanmar	6.8	5.5
Nepal	2.9	0.9
India	5.2	54.4
Indonesia	0.5	2.3
Thailand	8.7	5.3
Viet Nam	2.8	1.7

^a Detailed methodology and year 2000 estimates published in Corbett et. al. 2003. Arch Intern Med 163:1009-1021.

^b Global TB Report 2005, WHO (WHO/HTM/TB/2005.349) and <http://www.who.int/GlobalAtlas/PDFFactory/TB/index.asp>, accessed April 2005.

^c 2002 estimates accessed April 2005: <http://www.who.int/docstore/gtb/tbestimates/2002tbestimates.xls>

Table 4 shows the proportion of estimated TB deaths (numbers and rates) among those infected with HIV for some countries in the two regions. In the South-East Asia Region, 0.7% of prevalent TB cases are infected with HIV, but 4% of TB deaths occur among cases with HIV (11% in Thailand). In the Western Pacific Region, 0.2% of prevalent TB cases are infected with HIV and 3% of TB deaths occur in cases infected with HIV (1.5% in Cambodia). Surveillance of HIV in notified TB cases is not yet routinely done in all countries with concentrated or generalized HIV epidemics.

2.4 Drug Resistance

Multidrug-resistant tuberculosis (MDR-TB) is posing a threat to tuberculosis control in several countries.

¹⁰ Jai P. Narain (ed). *AIDS in Asia: The challenge ahead*. WHO Regional Office for South East Asia 2004

Table 4: Deaths due to TB in HIV-positive patients for countries with high TB/HIV burdens

	TB deaths among HIV+	
	Numbers (thousands)	Rates (per 100 000) ^a
India	22.2	2.1
Myanmar	1.4	2.9
Thailand	1.3	2.1
South-East Asia	26.0	
Cambodia	2.4	17.6
China	2.2	0.2
Malaysia	0.1	0.3
Papua New Guinea	0.1	2.2
Philippines	0.2	0.3
Viet Nam	0.4	0.5
Western Pacific	5.5	
Total	31.5	

^aRates per 100 000 general population

In 1994, WHO, the International Union Against TB and Lung Disease (The Union) and several partners launched the Global Project on Anti-Tuberculosis Drug Resistance Surveillance. The Global Project methodology for surveillance of drug resistance was designed around and continues to operate on three main principles: (1) surveillance must be based on a sample of TB patients representative of all cases in the geographical setting under evaluation; (2) drug resistance must be clearly distinguished according to the treatment history of the patient in order to allow correct interpretation of resistance data; and (3) optimal laboratory performance must be attained through participation in a quality assurance programme including the international exchange of strains of *Mycobacterium tuberculosis*.

Drug resistance was present in almost all settings surveyed in the South-East Asia and Western Pacific Regions. The prevalence of drug resistance varied widely across settings though (Table 5). Highest prevalence rates of MDR-TB were observed in Liaoning (24.4%) and Henan (36.6%) provinces in China.

Three DOTS-plus pilot projects designed to treat MDR-TB cases under programme conditions were initiated in Bangladesh, India, Nepal and the Philippines in 2003.

Continuous monitoring of trends in high prevalence MDR settings is essential in order to assess current interventions and their impact on the epidemic. To date, it is difficult to interpret trends in high MDR prevalence settings with any certainty. No area reaching MDR prevalence of >6.5% has dropped below that point in subsequent surveys suggesting that, when a critical threshold of transmission has been reached within a population, it may take a considerable amount of time to decrease the prevalence of MDR-TB. The results of improved TB control interventions under DOTS and targeted interventions such as DOTS-plus may not be as rapidly evident in these settings as they might in a population with a lower prevalence of resistance.

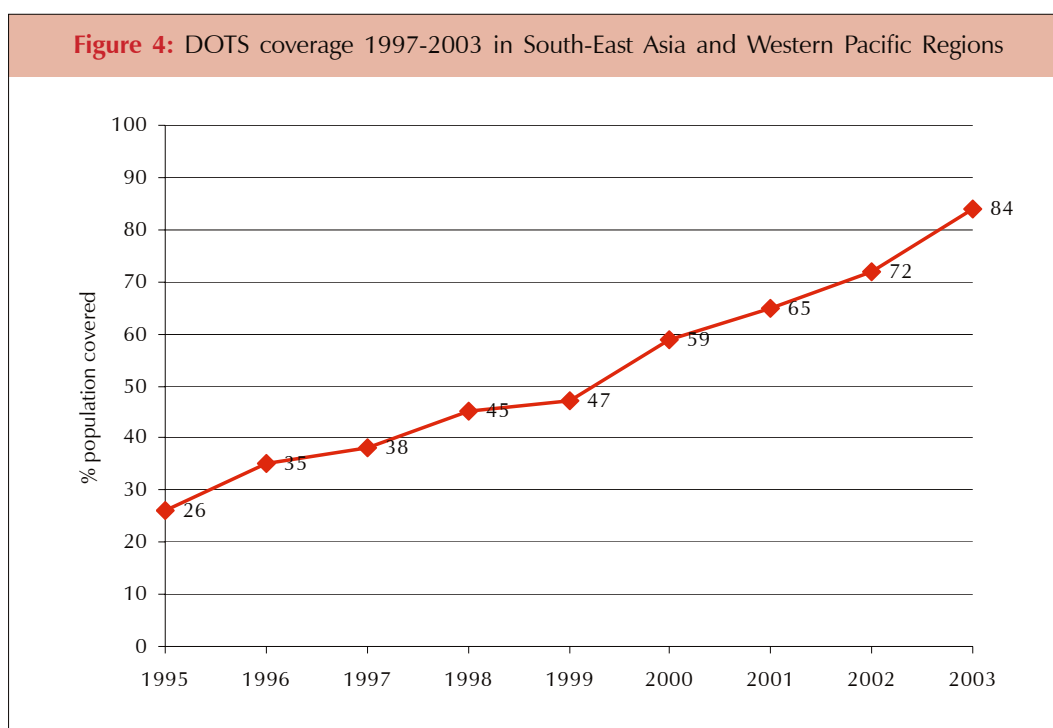
Table 5: Anti-tuberculosis drug resistance, by country

	New cases					Previously treated cases	
	Year	No.	INH Resistance	Any Resistance	MDR	No.	MDR
South-East Asia Region							
India							
North Arcot	1999	282	12.8	23.7	2.8		
Raichur District	1999	278	12.2	21.9	2.5		
Wardha District	1999	197	10.7	19.8	0.5		
Nepal	2001	755	1.6	11	1.3	171	20.5
Thailand	2001	1 505	5.3	14.8	0.9		
Myanmar	2003	733		30.2	4	172	20.3
Western Pacific Region							
Australia	2001	770	5.6	9.9	1.6		
Cambodia	2001	638	4.7	10.3	0	96	3.1
China, Hong Kong	2001	3 470	2.3	10.2	0.8	169	11.2
China							
Henan	2001	1 222	3.3	29.8	7.8	265	36.6
Hubei	1999	859	3.7	17.5	2.1	238	21.8
Liaoning	1999	818	5.4	42.1	10.4	86	24.4
Inner Mongolia	2003	806	5.0	35.0	7.3		
Zhejiang	1998	802	2.7	14.8	4.5	140	35.0
Korea	1998	2 370	4.9	10.6	2.2	283	7.0
Japan	1997	1 374	2.0	10.3	0.9	264	19.7
Malaysia	1996	1 001	1.0	4.2	0	16	0.0
Mongolia	1999	405	4.4	29.4	1		
New Zealand	2001	272	4.4	11.4	0	22	0.0
Singapore	2001	823	1.6	5.0	0.5	126	8.0
Viet Nam	1996	640	6.7	32.5	2.3		

Progress in TB Control

3.1 DOTS Coverage

Among the 48 countries and areas in the South-East Asia and Western Pacific Regions, all but two had at least part of their population covered by DOTS units. Figure 4 shows the DOTS population coverage achieved between 1995 and 2003.



Much of the increase in population coverage in recent years is attributed to DOTS expansion in India, China and Myanmar.

3.2 Case Detection

The DOTS case-detection rate in the two Regions (see Annex 1 for definition) was 78% for all tuberculosis and 47% for new smear-positive cases (Table 6). In other words, the 2.5 million notified cases (all forms) represented 51% of the 5 million estimated cases (all forms) and the 1.1

Table 6: DOTS case detection rates of all forms and smear-positive (SS+) cases in 2003

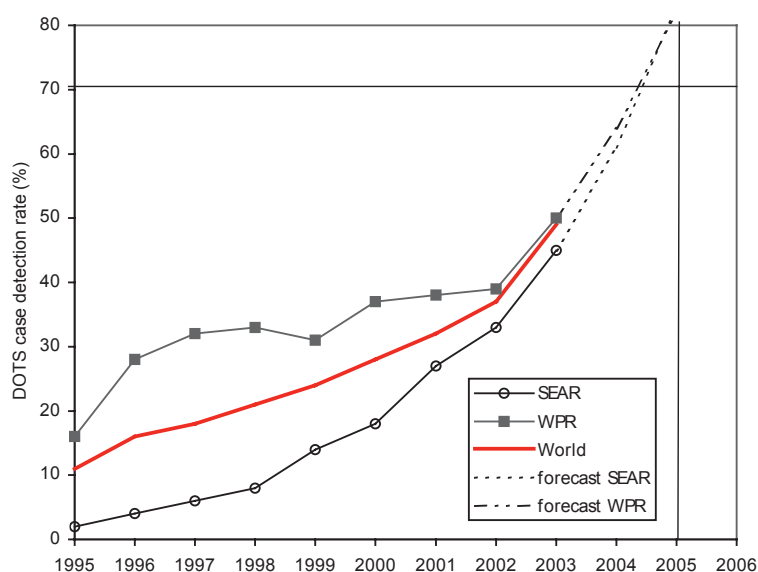
	DOTS case-detection rate (percentages)	
	SS(+) cases	Increase (2002–2003)
South-East Asia	45	+36
Western Pacific	50	+28
Overall	47	+34

million notified new smear-positive cases represented 50% of the estimated new smear-positive cases.

The overall case-detection rate (DOTS and non-DOTS) was 51% for both Regions individually and combined. For smear-positive cases, this was 49% in South-East Asia and 52% in the Western Pacific Region. DOTS areas reported 47% of all estimated new

smear-positive cases (i.e. one million new smear-positive cases) in the two Regions. Case detection has increased 34% between 2002 and 2003 in the two regions.

Figure 5: Trends in DOTS case detection rates in South-East Asia and Western Pacific Regions 1995-2003.



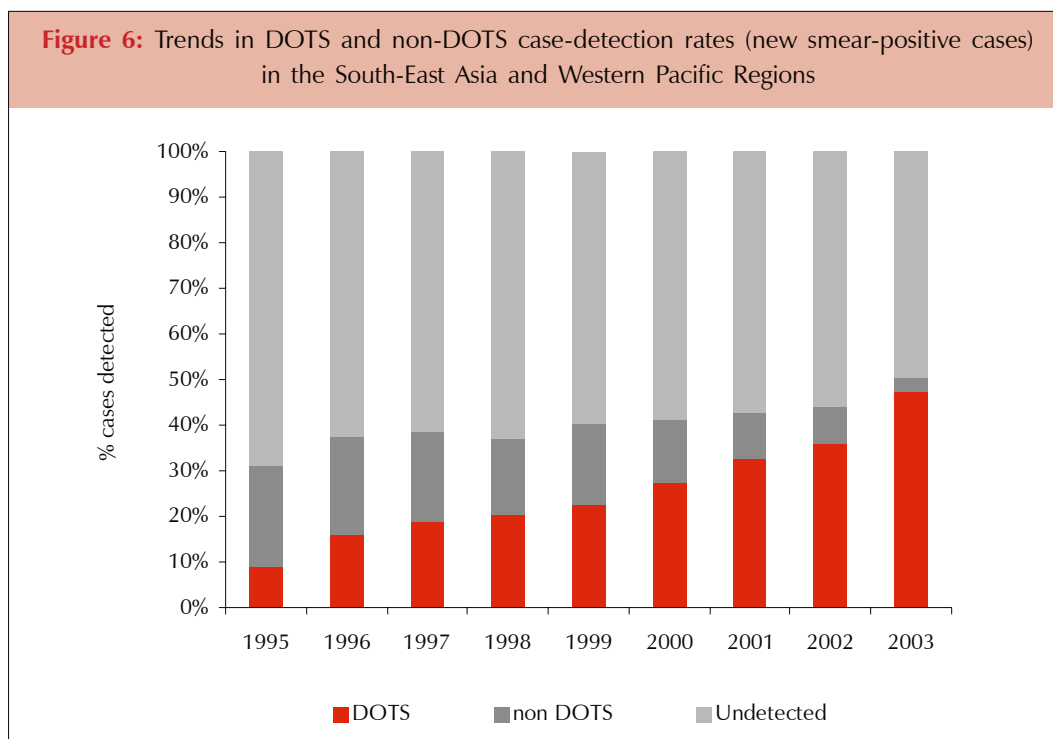
Note: The forecast lines for both the South-East Asia and Western Pacific Regions are based on the assumption that the annual rate of increase between 2003 and 2006 would remain similar to the annual rate of increase from 2002 to 2003.

DOTS case detection has made steady progress in the South-East Asia Region since 1998 whereas progress in the Western Pacific Region was slow until 2002. The increase in case detection in the South-East Asia Region is largely due to the large increase in India (+52%) between 2002 and 2003. Similarly, the increase in case detection (+28%) in the Western Pacific Region between 2002 and 2003 is mostly due to a dramatic increase in case detection in China (+59%).

If the rate of progress from 2002 to 2003 is maintained, the global target of 70% case detection rate may be reached in both Regions by the end of 2005 or during early 2006. In total, over 1.1 million additional new smear-positive cases will need to be detected per year to reach the target (760 000 in the South-East Asia Region and 437 000 in the Western Pacific Region).

3.3 DOTS Enrolment and Progress in Overall Case Detection

Figure 6 shows trends in new smear-positive case detection rates in DOTS and non-DOTS areas in both Regions during the period 1995 to 2003. In the South-East Asia Region, the DOTS case-detection rate increased initially at the expense of the non-DOTS case-detection rates. The total case-detection rate although increasing slightly, only made rapid gains after 1999. In the Western Pacific Region, the total case-detection rate was stable from 1997 to 2002 although there was a rapid DOTS expansion during this period.



3.4 Treatment Outcomes

In DOTS areas, the cure and treatment success rates were 82% and 88% respectively, for the cohort of 790 916 new pulmonary smear-positive cases registered for treatment in 2002 (85% and 81%, respectively in the South-East Asia Region, and 91% and 84%, respectively in the Western Pacific Region). With the minimal difference between cure and treatment success rates (6%), TB control programmes should not have difficulty in reaching 85% cure rates. It is notable that the failure rates in both DOTS (2%) and non-DOTS (1%) areas are very low (Figure 7).

In total, 23 countries and areas out of the 45 that reported treatment outcomes below the 85% global target, five are in the South-East Asia Region, including three high burden countries¹¹ (Bangladesh, Myanmar and Thailand), and 18 in the Western Pacific Region, including two high burden countries¹² – (Lao PDR and Papua New Guinea). Non-DOTS areas reported a lower success rate for treatment completion than DOTS areas.

¹¹ Countries with a high burden of tuberculosis in South-East Asia Region belong to the global list of 22 high burden countries: Bangladesh, India, Indonesia, Myanmar and Thailand.

¹² Seven countries in the Western Pacific Region are considered to have a high burden of tuberculosis: Cambodia, China, Lao PDR, Mongolia, Papua New Guinea, the Philippines, Viet Nam.

Figure 7: Treatment outcomes for new smear-positive cases registered in 2002 in DOTS and non-DOTS areas in South East-Asia and Western Pacific Regions

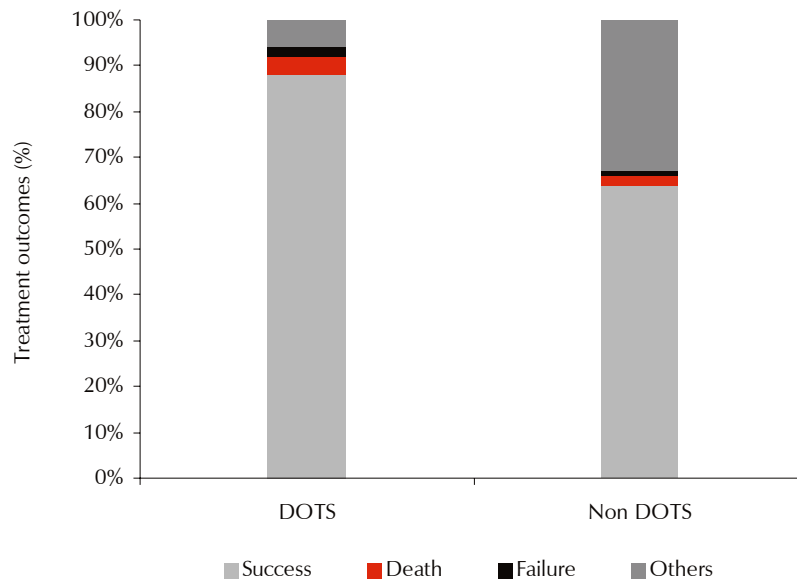
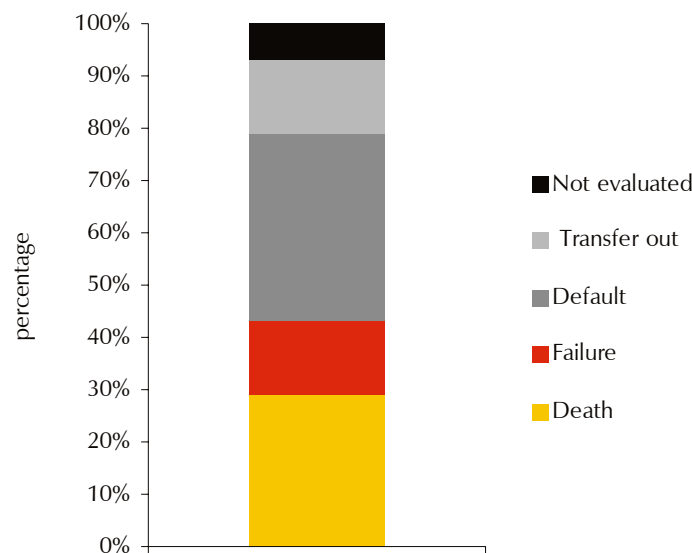


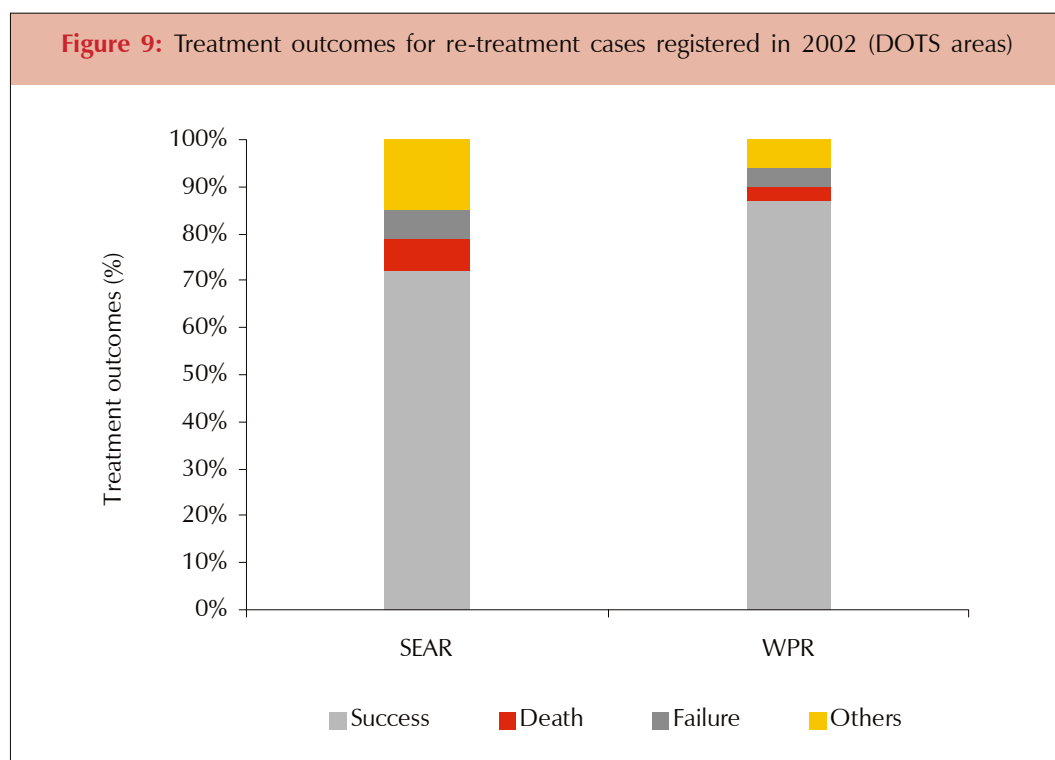
Figure 8 shows the distribution of unfavourable outcomes in both regions combined. Defaults (36%) followed by deaths (29%) together account for close to two-thirds of all unfavourable outcomes among new smear-positive TB cases registered under DOTS programmes in the Western Pacific and South-East Asia Regions in 2002.

Figure 8: Unfavourable outcomes among new smear-positive cases registered in 2002 in DOTS areas in South East Asia and Western Pacific Regions



3.5 Treatment Results of Re-treatment Cases

Figure 9 shows treatment outcomes for re-treatment cases in the South-East Asia and Western Pacific Regions. In 2003, the proportion of relapse cases among all smear-positive cases was 9.7% in the South-East Asia Region and 19% in the Western Pacific Region. The high proportion of relapses among all smear-positive cases in the Western Pacific Region was mainly due to the high proportion of relapses observed in China (26%). The high success rate among re-treatment cases in China accounted for the overall high treatment success rate (92%) among re-treatment cases in the Western Pacific Region. A larger proportion of deaths occurred among re-treatment cases in the South-East Asia Region (7%) than among those in the Western Pacific Region (3%). Thailand contributed to the large proportion of re-treatment deaths in the South East Asia Region (17%). This is partly due to the higher HIV prevalence and an ageing population in Thailand.



Grouping of Countries

4.1 High Burden Countries

High burden countries include Bangladesh, India, Indonesia, Myanmar and Thailand in the South-East Asia Region, and Cambodia, China, Lao PDR, Mongolia, Papua New Guinea, the Philippines and Viet Nam in the Western Pacific Region¹³. All high burden countries in the South-East Asia Region belong to the WHO list of 22 high burden countries¹⁴.

Epidemiology

In 2003, the high burden countries accounted for 96% of the South-East Asia Region's population and for 86% of the Western Pacific Region's population; and for 95% of notified new cases in the South-East Asia Region and for 91% of the notified new cases in the Western Pacific Region.

Overall case detection of new TB cases has made considerable progress in China and India from 2002 to 2003 (+59% and +52% respectively). The estimated prevalence rates (all cases) have decreased at a rate of -2%/yr in China and -4%/yr in India. The estimated incidence rate (all cases) has decreased at a rate of -1%/yr in China but remained stable in India.

Figure 10 shows trends in DOTS and non-DOTS case-detection rates in China, India, Indonesia and Viet Nam. In China and India, most of the increase in the DOTS case-detection rate until 2002 has occurred at the expense of non-DOTS areas while early and extensive DOTS coverage in Indonesia and Viet Nam resulted in a regular increase in overall case-detection rates.

Figure 11 shows the age distribution of cases in three of the highest burden countries in the two regions. A contrasting age pattern emerges between India and Indonesia, where a hump of higher notification rates is observed in the age group 15 to 64 years as opposed to China, where the pattern resembles that of middle to high-income countries with increasing rates with age.

Figure 12 shows increasing notification rates with age, with the exception of the Philippines, which follows a pattern similar to India and Indonesia but with much higher rates overall.

Progress in TB control

All countries with a high burden of TB are using WHO-recommended guidelines for national TB control programmes. Drug procurement is centralized in all countries. National reference

¹³ Based on incidence rates per 100 000 population.

¹⁴ WHO. Global Tuberculosis Control 2005. Surveillance, Planning, Financing. WHO Geneva 2005.

Figure 10: Trends in DOTS and non-DOTS case-detection rates (new smear-positive cases) in China, India, Indonesia and Vietnam

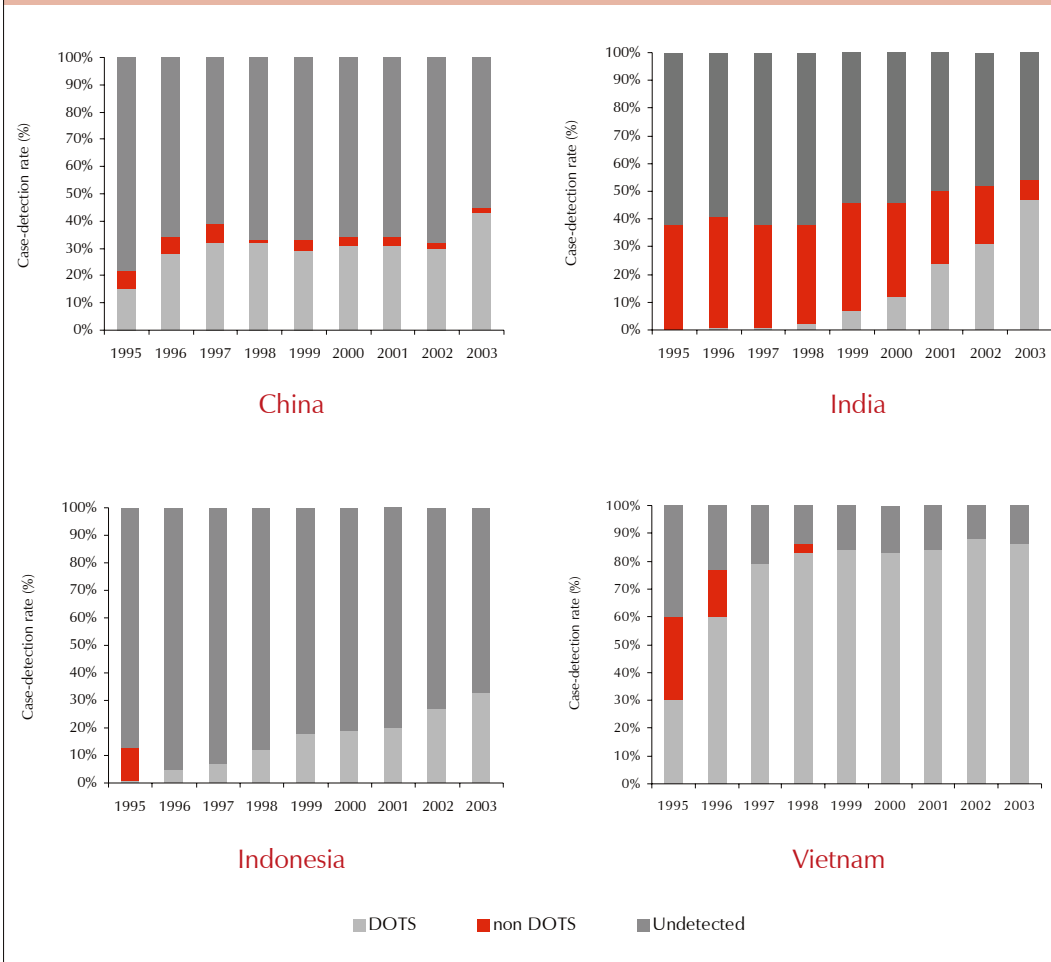


Figure 11: Age-specific smear-positive notification rates per 100 000 population in China, India and Indonesia

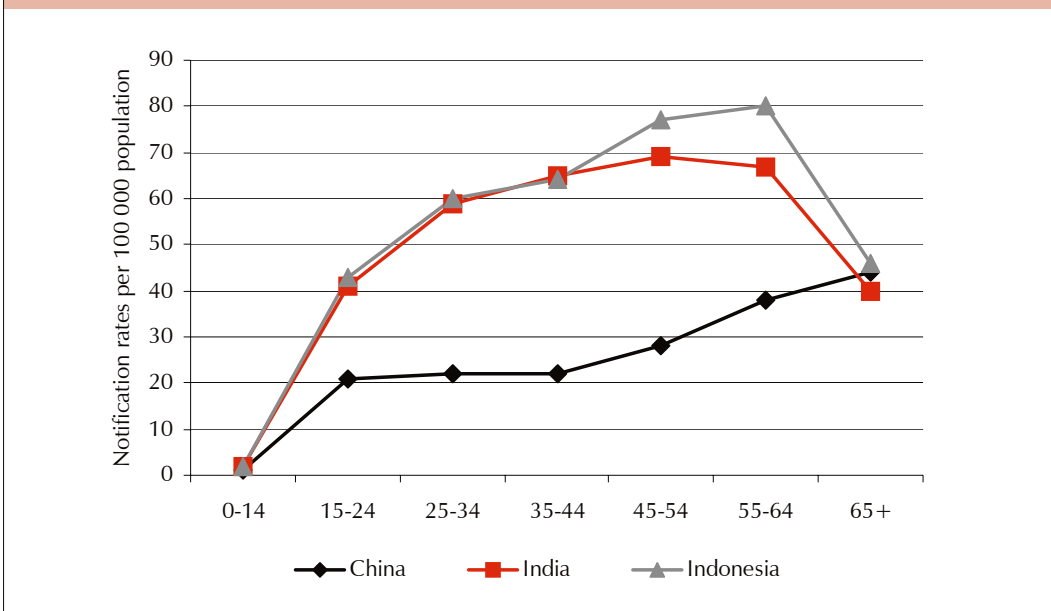
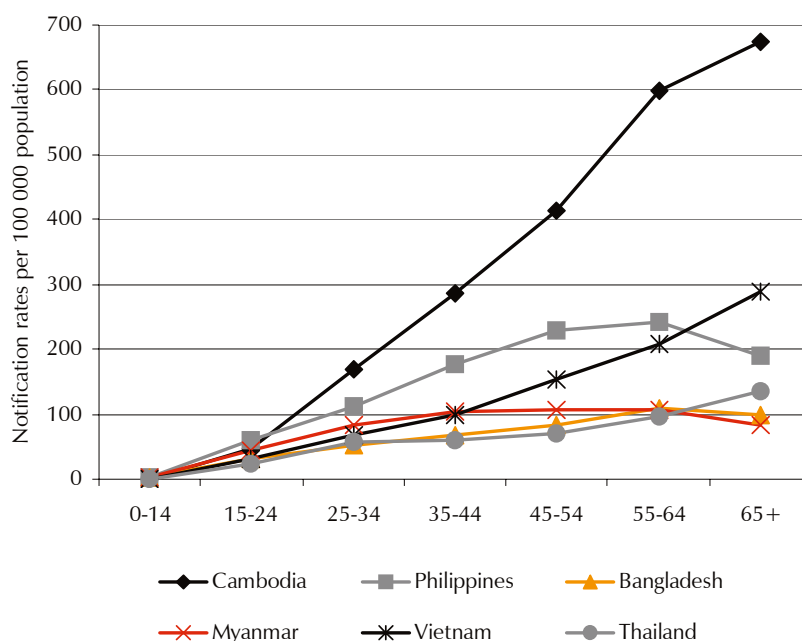


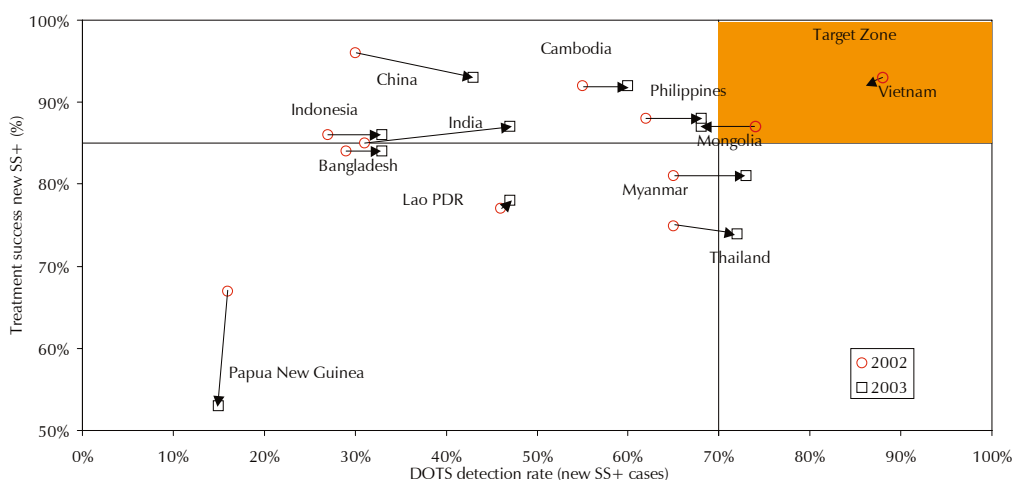
Figure 12: Age-specific smear-positive notification rates per 100 000 population in several high-burden countries in South-East Asia and Western Pacific Regions.



laboratories have been designated. All the countries use sputum microscopy for diagnosis and directly observed treatment (DOT) is applied in most public health units within DOTS areas. Treatment and smear microscopy examinations are free of charge in all public health facilities in DOTS areas in these countries. Reporting of treatment results is based on cohort analysis in all countries with DOTS programmes. Screening and treatment of contacts is done in some units only.

DOTS expansion made the most significant progress in the high burden countries. Figure 13 presents the progress of DOTS towards targets between 2002 and 2003.

Figure 13: Progress of DOTS towards targets in high-burden countries in South-East Asia and Western Pacific countries



The treatment success in Thailand remains below the WHO target because of high death rates, which are partly attributed to HIV and to a comparatively high proportion of older patients. The performance of the TB programme in Papua New Guinea remains unsatisfactory.

Thailand has integrated TB and HIV programmes at the central and provincial levels, allowing streamlined TB-HIV activities. India has successfully expanded DOTS employing contracted national consultants who assist the state level NTP managers in implementing and monitoring the programme at the field level. China has recently made progress in case detection as a result of a strong political commitment at all levels and countrywide implementation of a public-public partnership linking general hospitals and TB dispensaries. Multidrug-resistant TB remains at high levels in several provinces, and there is a need to assess the magnitude of anti-TB drug resistance nationally. Myanmar has continued to make steady progress with case detection and treatment success along with phased expansion. Bangladesh and Indonesia are making slower advances in case detection while maintaining high treatment success rates.

The transition to decentralized health care systems in countries such as Indonesia poses a great challenge to maintaining a successful TB programme because of the limited management capacity and insufficient human resources at provincial and district levels. Future actions in these countries to improve the TB programme will focus on human resource development (HRD) including capacity building through training of health staff, particularly for supervision and quality assurance¹⁵.

Common issues and challenges include overstretched public health systems, the lack of adequate infrastructure and sufficient skilled staff. HIV-TB and MDR-TB create additional challenges in several countries with a high burden of TB. There is increasingly a need for greater involvement of other sectors, particularly the private sectors to ensure access to quality services and for attention to information, education and communication guidelines to improve community awareness and utilization of services.

4.2 Low and Intermediate Burden Countries

High income countries

Epidemiology

Middle to high income countries include Australia, Brunei Darussalam; China, Hong Kong SAR; China, Macao SAR, Japan; the Republic of Korea; Malaysia, New Zealand and Singapore. A stagnation of notification rates (defined as a slowdown or reversal of the annual decline of the crude notification rate) is observed in several countries and areas (Table 7). Notification rates continue to decline in the Republic of Korea, Japan, Singapore and, to a lesser extent, in Hong Kong SAR. However, the causes of this stagnation vary between countries. Although ageing of the population and the epidemic appears to be a major contributing factor, depending on the local situation, other factors such as migration and HIV, do play an important role. With the exception of Malaysia, all countries have a high case-detection rate among all TB cases, well above the 70% global target.

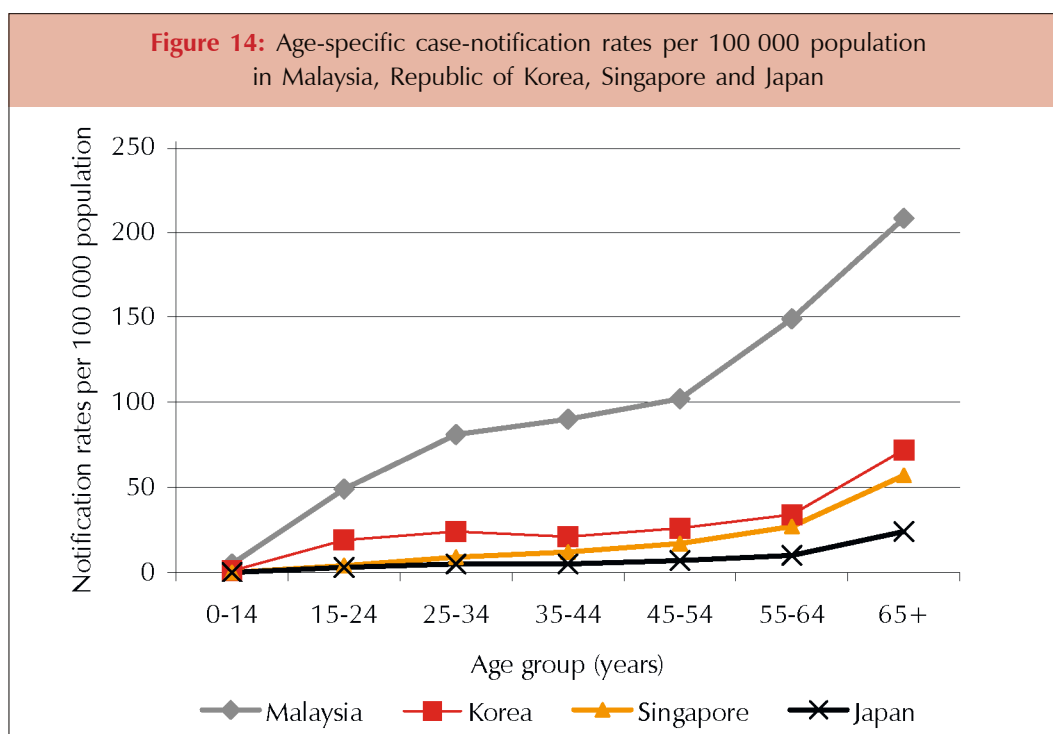
¹⁵ Tuberculosis Control in the South-East Asia Region 2004, WHO Regional Office for South-East Asia (SE-TB-272)

Table 7: Annual rate of change in notification and case-detection rates (all cases) in middle to high-income countries

	Yearly rate of change in notification rates (%)		Yearly rate of change in CDR (%)	Case detection rate (%)
	1980-90	1990-2003	1990-2003	2003
Australia	-6.0	-1.7	0	84
Brunei Darussalam	-10.0	+1.3	-1	106
China, Hong Kong SAR	-2.7	-1.5	-3	103
China, Macao SAR	-13.0	+0.75	-1	97
Japan	-3.6	-3.7	-4	79
Republic of Korea	-4.2	-5.9	0	81
Malaysia	-3.3	+0.19	-1	61
New Zealand	-6.6	+0.25	0	94
Singapore	-7.8	-3.4	-3	92

In Hong Kong SAR and Singapore, stagnation is mainly due to ageing of the tuberculosis epidemic and ageing of the population. Some risk groups seem to emerge, such as the urban poor, and the homeless. Population movements may have some importance, such as migrant workers in Singapore and travel in and out of mainland China into Hong Kong SAR.

In Malaysia, increasing tuberculosis notification rates in the 25-44 age group and the relatively high case-fatality rates in this age group suggest that tuberculosis is increasing at least in part due to the spread of HIV infection in this population (Figure 14).



In Brunei Darussalam and Macao SAR, changes in diagnostic practices and/or notifications, as well as ageing of the tuberculosis epidemic, appear most important, but transmission from migrant workers seems to play a role.

The Republic of Korea shows a continuing decline. However, some stagnation due to ageing of the epidemic may be expected within the next 20 years as the annual risk of infection has declined to approximately 0.5% and therefore there is limited scope for further decline.

Treatment success was below the 85% target in Australia, Brunei Darussalam, Hong Kong SAR, Japan, Korea, and Malaysia. This may be attributed partly to high death rates due to the age structure of the cases in countries such as Australia (10% death rate), to an increasing impact of HIV in countries such as Malaysia (8% death rate) where there is an increase in notification rates in the 25-44 years age group, or to high transfer rates such as in the Republic of Korea (10% transfer rate) where the information system does not easily capture treatment outcomes.

Progress in TB control

With the exception of Japan, the Republic of Korea and Australia, all middle to high-income countries have 100% DOTS coverage. China and the Republic of Korea use an internet-based surveillance system, which in the Republic of Korea also covers the private sector. Japan passed a new legislation for tuberculosis control which will put emphasis on active case detection in high-risk groups. TB-HIV collaborative activities were progressively being implemented in Malaysia. Tuberculosis control has not been thoroughly assessed in vulnerable populations (migrants, elderly, homeless, intravenous drug users), where barriers to TB services exist. Population movements have some importance, such as migrant workers in Singapore and Brunei Darussalam, and travel in and out of mainland China into Hong Kong SAR. TB notification rates in Australia are much higher in the population of foreign origin and largely reflect notification rates in the country of origin.

Countries with emerging economies

There are five countries in this category without a relatively high burden of TB, all in the South-East Asia Region¹⁶. These countries include both mountainous nations of Bhutan, the Democratic People's Republic of Korea and Nepal, as well as Sri Lanka, and Timor-Leste.

Epidemiology

The case-notification rates for 2003 among this group of countries are very heterogeneous, ranging from 16 per 100 000 in Bhutan to 132 per 100 000 in Timor-Leste. In DPR Korea's the yearly rate of change for case detection is at +89% between 1999 and 2003 reflecting a huge increase in case detection from 2% to 96% in less than five years. The crude case-notification rate has also increased over 25% during the same period.

The age-specific notification rates for Bhutan and Sri Lanka are the lowest in the group and also fairly constant across the age groups. DPR Korea and Nepal have a similar trend with increasing rates from 0-54 years followed by a strong decline in rates in the 55+ ages. The notification rates

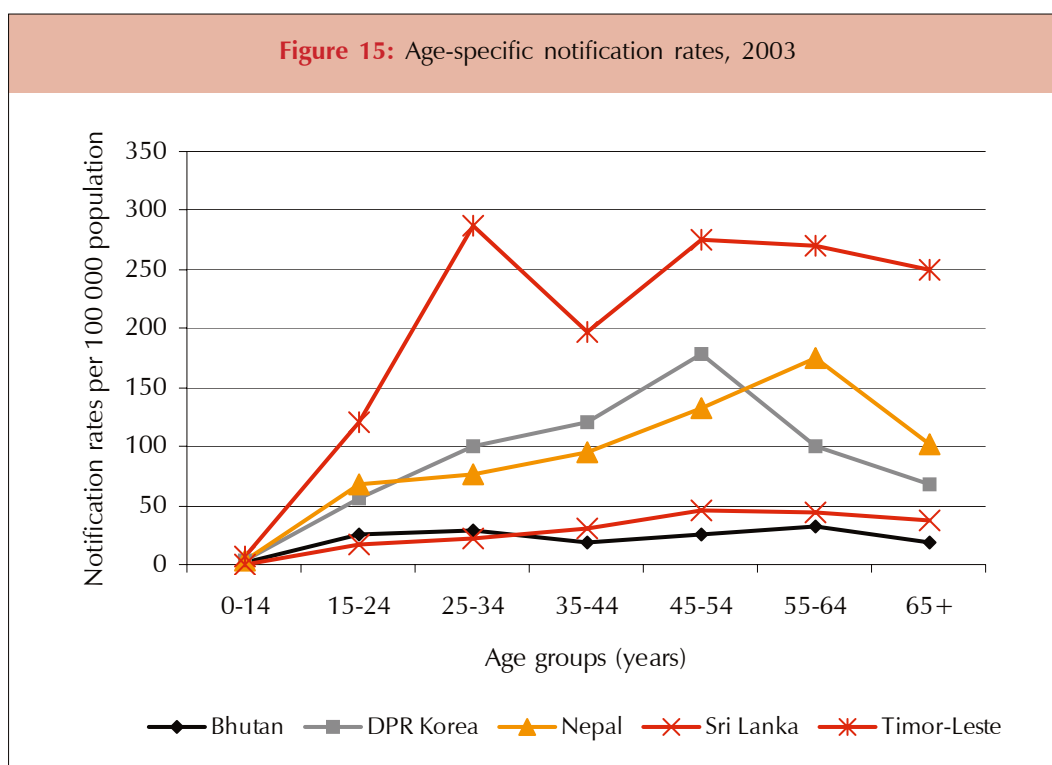
¹⁶ Tuberculosis Control in the South-East Asia Region 2004, WHO Regional Office for South-East Asia (SE-TB-272)

Table 8: Case-notification rates, case-detection rates and rate of change, 1999-2003

Countries	SS+ notification rate (per 100 000)	Overall SS+ case-detection rate	CDR yearly rate of change 1999-2003	Notification rate yearly rate of change 1999-2003
Bhutan	16	32%	5.0%	-6.1%
DPR Korea	77	96%	89.4%	25.5%
Nepal	57	60%	6.3%	0.5%
Sri Lanka	23	83%	-0.8%	4.3%
Timor-Leste ^a	132	53%	-11%*	-5.2%*

^a rate of change is only for 2002-2003 period for Timor-Leste

in Timor-Leste are greater than in the other countries in this group and have the highest rates in the 45+ age groups.



Progress in TB control

Case-detection rates for smear-positive tuberculosis in these countries range from a low of 32% in Bhutan to a high of 96% in DPR Korea. The highest population coverage (100%) in Bhutan is offset by the lowest case-detection rate (32%) in this group of countries. Nepal also demonstrates a similar paradox with high coverage (94%) but lower than optimal case detection (60%). DPR Korea shows a reversal of this relationship with the highest case-detection rate (96%). The case detection rate has remained fairly steady at a little over 70% in Sri Lanka during the same period. Treatment success rates are consistently high, above 81% in all countries in this group.

A key challenge for expansion of DOTS implementation in this group of countries is the insufficient capacity to ensure quality laboratory diagnostic services, especially in Bhutan,

Table 9: Progress with DOTS in 2003

Countries	DOTS population coverage (%)	Overall SS+ case-detection Rate (%)	Treatment success (2002 cohort) (%)	SS+ Case notification rate (per 100 000)
Bhutan	100	32	86	16
DPR Korea	80	96	88	77
Nepal	94	60	86	57
Sri Lanka	74	83	81	23
Timor-Leste	78	53	81	132

DPR Korea and Sri Lanka. Technical and managerial capacity requires strengthening with minimum staff turnover in Sri Lanka and Timor-Leste. For the hilly countries bordering India, namely Nepal and Bhutan, internal and cross-border migration of the population remain a problem as does population access to health care in remote regions.

Plans for further strengthening DOTS programmes in all these countries include building managerial and human resource capacity at all levels, increasing community awareness, attention to improved supervision and monitoring including quality assurance for laboratory services. In addition, in Bhutan, DPR Korea and Timor-Leste's plans are under way to improve infrastructure. Annual risk of TB infection (ARTI) surveys are being planned in DPR Korea and Nepal. In addition, the pilot DOTS Plus project has been initiated in Nepal.

Island Countries

Epidemiology

The island countries¹⁷ group includes Maldives in the South-East Asia Region and Pacific Island Countries (PICs) in the Western Pacific Region: American Samoa, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Northern Mariana Islands, Marshall Islands, the Federated States of Micronesia, Nauru, New Caledonia, Niue, Palau, Pitcairn, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Wallis and Futuna.

Case-notification rates vary widely among island countries. Rates also fluctuate with time due to the very small population size of most countries or areas. In the Pacific, higher rates are consistently observed north of the equator, with the exception of Guam, as compared to countries located south of the equator. Notification rates (all types) in Kiribati have been consistently higher than 200 per 100 000 since 1998, and are the highest rates recorded in the Western Pacific Region.

A great deal of uncertainty is attached to estimates of incidence and prevalence in individual island countries and areas due to the limited amount of data and the small population size. Several countries show a case-detection rate well over 100% as a result of poor estimates of incidence and mopping up of prevalent cases.

The prevalence of HIV is low in all island countries and none of them has reached the concentrated stage of the epidemic. HIV has therefore a very limited impact on the epidemiology of TB in these countries.

¹⁷ The term "Island Countries" refers to both countries and areas

There is limited data on drug resistance in the Island countries; overall estimates indicate low rates of multidrug resistance.

Progress in TB control

With the exception of the Federated States of Micronesia and Wallis and Futuna, all island countries have 100% DOTS coverage despite widely scattered populations where organization of tuberculosis control is complicated.

Maldives was one of the first countries globally to achieve both cure rate and case-detection targets in 1997 and has surpassed these since 2000.

Key challenges and constraints include weak supervisory capacity because of difficulties in travelling between islands, as well as in organizing decentralized treatment services, and inadequate laboratory capacity with limited capacity to implement national quality assurance programmes.

Monitoring with precision progress towards the Millennium Development Goals in island countries will remain a challenge until better estimates of tuberculosis morbidity and mortality can be obtained.

Future actions to improve TB control in Maldives will involve continued training of health staff and an improved communications strategy, particularly in the treatment of latent TB as the country moves towards elimination of TB entirely. Training efforts including training for TB laboratory staff are pursued in Pacific Island countries. The majority of islands in PICs are situated in remote locations and transport is infrequent and unreliable in some cases. Recognizing the unique situation of the Pacific, the Secretariat of the Pacific Community (SPC), the Member States and WHO endorsed a Pacific Strategic Plan to Stop TB in 2000.

WHO'S WORK

5.1 WHO's Work in the Regions

WHO has continued to assist countries in both regions towards achieving the 2005 global targets and in reducing the burden of TB.

Although there are separate regional strategic plans for South-East Asia Region (SEAR Strategic Plan for TB Control 2002-2006¹⁸) and the Western Pacific Region (WPR Strategic Plan 2000-2005¹⁹), the two regions share common broad strategies to achieve the goals of TB control. The implementation of these strategies had been critical to achieving progress in both regions:

- Expanding DOTS has been the key strategy to curb the TB epidemic in both regions. National TB programmes were assisted to build technical and managerial capacity to ensure quality while continuing to expand DOTS to cover the entire population in countries.
- Improving case detection as the major focus of activities closely following on DOTS expansion. Countries were assisted to build and expand collaboration/partnerships with other sectors and providers, and to improve community awareness and use of DOTS services.
- Strengthening advocacy, communications and social mobilization activities to increase political commitment and community participation in TB control.
- Implementing a collaborative approach to addressing the emerging challenge of TB-HIV co-infection.

In the Western Pacific Region, there was strong support for implementing activities to address the issue of multi-drug resistant-TB in several countries and enhancing country capacity for surveillance and programme monitoring. In the South-East Asia Region, implementation of operational research to identify replicable interventions to more effectively deliver DOTS in the diverse health settings has been a priority activity.

WHO played a catalytic role in implementing these strategies in the countries through focused technical support, capacity strengthening, effective coordination, information exchange,

¹⁸ Regional Strategic Plan for TB Control 2002-2006. WHO Regional Office for South-East Asia, New Delhi (SE-TB-246).

¹⁹ Regional Strategic Plan to Stop TB in the Western Pacific Region 2000-2005. WHO Regional Office for the Western Pacific. Manila. 2000.

advocacy, monitoring and supervision, and strengthening partnerships and mobilizing resources for TB control.

Providing timely and effective technical support

The regional and country offices continued to assist countries in effectively undertaking TB control activities through sustained technical assistance, in-country missions, information exchange and consensus building on effective strategies and policies for TB control.

Bringing technical assistance closer to the countries is one of the key approaches that have led to good progress. Long-term professional staff have been posted in five countries of the SEA Region (Bangladesh, India, Indonesia, Myanmar and Nepal) and six countries and areas in the Western Pacific Region (Cambodia, China, Pacific island countries, Papua New Guinea, the Philippines and Viet Nam). A network of national professional officers and national consultants is providing technical assistance at the field level in all countries with a high burden of TB.

In both regions, WHO continues to provide targeted technical assistance for specific areas and to strengthen the operationalization of regional and country strategies. In recent years, technical assistance has been targeted at accelerating DOTS expansion and case detection, and in initiating response to emerging issues that included TB-HIV, MDR-TB and collaboration between public and private health providers for TB control.

Capacity strengthening

WHO is continuing to strengthen technical and management capacity for TB control in both regions. One of the crucial areas is improving human resource capacity, which has been one of the persistent challenges of TB control. WHO continues to support regional, intercountry and national training courses on TB control in several areas, including surveillance and data management, laboratory methods for the diagnosis of TB including quality assurance, TB-HIV and drug resistance surveillance. WHO also supports fellows from countries for specific technical and management capacity strengthening objectives, which were found useful by many countries to promote exchange of information on lessons learnt with implementing DOTS and addressing specific challenges. In the SEA Region, the inter-country courses on comprehensive TB control and on leadership and strategic management for TB control programme managers have resulted in similar training being undertaken at the national level. In the WP Region, around 25 TB staff from different countries in the Region are supported to the International TB Course in Viet Nam organized in collaboration with the International Union of Tuberculosis and Lung Diseases (IUATLD).

WHO is building capacity in the countries to respond to challenges by developing regional guidelines and plans and supporting countries to adapt these guidelines or plans to their specific settings. WHO has published the Quality Assurance Guidelines for Smear Microscopy in the Western Pacific Region, which had been the basis of the specific guidelines in some countries. To provide guidance on TB-HIV response, the SEA Region developed the Regional Strategic Plan on HIV-TB while the Western Pacific Region published the TB-HIV Framework for Collaborative Activities, which now serves as the basis for country TB-HIV frameworks. Moreover, a training course on operationalizing TB-HIV interventions, held in Thailand in January 2005 and the TB-HIV conference

for the Mekong countries²⁰ held in Viet Nam, will help improve country capacity for joint TB-HIV activities.

With increasing emphasis on increasing good collaboration of health providers, especially private health providers, WHO is supporting countries to initiate and expand the private and public mix DOTS (PPMD) approach in some countries. Two countries in both regions, that is, India and the Philippines, have implemented PPMD projects that could be considered as models globally.

Effective coordination and information exchange

Both regions continued to coordinate information exchange and technical discussions on strategies and policies for TB control at regional and country levels. In both regions, a number of meetings were organized that include the regional Technical Advisory Group meeting, the meeting of national TB programme managers (including laboratory managers in the case of WPR) and other technical meetings, that include special meetings on surveillance and monitoring, PPMD, TB-HIV and other technical areas, at the regional or at the country level. The technical advisory or working group meetings and the meeting of the national TB managers provided opportunities to review the programme, discuss issues and constraints, exchange lessons learned, and discuss strategies and new approaches to overcome the challenges for TB control.

Sustaining political commitment for TB control has been part of the work. Both regions have implemented advocacy activities to maintain a good level of interest in TB control in the countries and also among donors. In 2004, WHO organized a China-WHO High Level Meeting to Accelerate TB Control in the 12 priority provinces of China. At this meeting, high-level officials, mostly vice-governors, affirmed their commitments to achieve the global TB control targets of 2005.

Strengthening partnerships and mobilizing resources for TB Control

Stop TB partnerships were established in 1999 in the Western Pacific Region and in 2003 in the SEA Region. WHO plays a key role in strengthening partnerships for TB control by providing fora at regional and country levels for discussions on several aspects of TB control among technical partners and donors, including technical, strategy and policy development and implementation, the effective and efficient use of financial resources.

WHO continues to work with international funding partners, including the Australian Agency for International Development, Canadian International Agency, United States Agency for International Development, Japan Government, World Bank and the Global Fund to close the gap for TB control in both regions. WHO assisted several countries with a high burden of TB to secure drug supplies from the Global Drug Facility and other donors, and for improving laboratory facilities through different donors.

For the Global Fund, almost all countries which applied for funding support for their NTPs were assisted to develop proposals during Round 4. Proposals from six countries in the two regions (Bhutan, China, India, Laos, Mongolia and Nepal) amounting to a total of US \$102

²⁰ Mekong countries include Cambodia, China Yunnan Province, Laos, Thailand, Myanmar and Viet Nam.

million over five years succeeded in getting Global Fund approvals during this round. Four years after the Global Fund was established, proposals approved by the Global Fund in both regions amount to a total of US \$393 million over five years, substantially reducing the funding gap to achieve the 2005 process targets of TB control.

Monitoring and evaluation

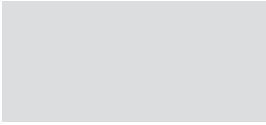
It is becoming increasingly important that countries be enabled to objectively measure and report on progress towards reaching the goals set by both regions. The Regional Offices continued to collect, compile, analyse and provide feedback to countries on routinely collected data on DOTS implementation. Information routinely collected from countries and analysed is published in the Global TB Control Report and the Bi-regional report on TB control in the Western Pacific and South-East Asia Regions. Monitoring missions were undertaken together with key partners and donors in most countries with a high burden of TB in 2004. These missions are useful for monitoring programme performance and assessing country capacity for surveillance and programme monitoring.

A regional workshop on surveillance and epidemiology was conducted in each of the two regions. The workshops have contributed towards building capacity at the national level to compile, analyse and effectively use routinely collected data and to plan for improved surveillance for TB. In addition, several countries have initiated plans to better estimate incidence, prevalence and mortality of TB at national and sub-national levels.

Operational research

Countries are being encouraged and supported in undertaking operational research projects that are contributing towards identifying mechanisms to improve access, make services more user-friendly and increase the involvement of other sectors, to further increase case detection and improve treatment outcomes. Projects to increase collaboration among a broad range of health providers are in place in Bangladesh, China, India, Indonesia, Republic of Korea, Myanmar and the Philippines, while other countries are being assisted to initiate similar collaborative activities. Communication for Behavioural Impact or COMBI, a new package for community information, education and communication, was piloted and evaluated by the Revised National Tuberculosis Control Programme (RNTCP) in India. Lessons learnt from these projects will be used to plan similar efforts in other countries in the Region.

Tables



Country data for the Western Pacific and South East Asia Regions: estimated burden of TB, 1990 and 2003

	Incidence, 1990						Prevalence, 1990						Death, 1990						Incidence, 2003						Prevalence, 2003						Death, 2003						
	All cases incl. HIV+		New ss+ incl. HIV+		All cases excl. HIV+		All cases incl. HIV+		New ss+ incl. HIV+		All cases excl. HIV+		All cases incl. HIV+		New ss+ incl. HIV+		All cases excl. HIV+		All cases incl. HIV+		New ss+ incl. HIV+		All cases excl. HIV+		All cases incl. HIV+		New ss+ incl. HIV+		All cases excl. HIV+		All cases incl. HIV+		New ss+ incl. HIV+		All cases excl. HIV+		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	
American Samoa	24	52	11	23	68	145	5	11	11	5	5	11	18	30	8	13	34	54	34	34	54	34	54	34	54	34	54	34	54	34	54	34	54	34	54		
Australia	1,067	6	478	3	1,195	7	171	1	171	1	1,128	6	505	3	1,142	6	1,142	6	1,132	6	1,142	6	1,142	6	1,132	6	1,142	6	1,142	6	1,142	6	1,142	6	1,142		
Brunei Darussalam	159	62	72	28	443	172	33	13	33	13	195	54	88	25	217	61	217	61	217	61	217	61	217	61	217	61	217	61	217	61	217	61	217	61	217		
Cambodia	56,202	577	24,848	255	154,356	1,584	12,009	123	11,593	119	71,830	508	31,758	225	107,836	762	107,836	762	105,008	742	107,836	762	105,008	742	107,836	762	105,008	742	107,836	762	105,008	742	107,836	762	105,008		
China	1,345,828	116	605,046	52	3,748,967	325	282,443	24	282,443	24	1,334,066	102	599,758	46	3,203,059	246	3,203,059	246	3,200,204	245	3,203,059	246	3,200,204	245	3,203,059	246	3,200,204	245	3,203,059	246	3,200,204	245	3,203,059	246	3,200,204		
China, Hong Kong SAR	6,326	111	2,845	50	17,611	309	1,329	23	1,327	23	5,439	77	2,446	35	5,554	79	5,554	79	5,548	79	5,554	79	5,548	79	5,548	79	5,548	79	5,548	79	5,548	79	5,548	79	5,548		
China, Macao SAR	348	93	156	42	969	260	73	20	73	20	382	82	172	37	414	89	414	89	413	89	414	89	413	89	414	89	414	89	414	89	414	89	414	89	414		
Cook Islands	10	52	4	23	27	145	2	11	2	11	5	30	2	13	11	59	11	59	11	59	11	59	11	59	11	59	11	59	11	59	11	59	11	59			
Fiji	376	52	169	23	1,047	145	79	11	79	11	249	30	112	13	318	38	318	38	317	38	318	38	317	38	318	38	317	38	318	38	317	38	318	38	317		
French Polynesia	102	52	46	23	283	145	21	11	21	11	73	30	33	13	94	39	94	39	94	39	94	39	94	39	94	39	94	39	94	39	94	39	94	39	94		
Guam	189	141	85	63	525	392	40	30	40	30	525	392	44	27	171	105	171	105	170	105	171	105	170	105	171	105	170	105	171	105	170	105	171	105	170	105	
Japan	64,322	52	28,927	23	71,939	58	10,323	8	10,313	8	39,927	31	17,956	14	53,210	42	53,210	42	53,154	42	53,210	42	53,154	42	53,210	42	53,154	42	53,210	42	53,154	42	53,210	42	53,154	42	53,210
Kiribati	101	141	45	63	282	392	21	30	21	30	282	392	21	30	53	60	53	60	53	60	53	60	53	60	53	60	53	60	53	60	53	60	53	60	53	60	
Lao PDR	7,376	178	3,318	80	20,547	497	1,548	37	1,548	37	8,891	157	3,999	71	18,504	327	18,504	327	18,494	327	18,504	327	18,494	327	18,504	327	18,494	327	18,504	327	18,494	327	18,504	327	18,494		
Malaysia	21,380	120	9,591	54	59,540	334	4,488	25	4,485	25	25,785	106	11,567	47	33,128	136	33,128	136	32,945	135	33,128	136	32,945	135	33,128	136	32,945	135	33,128	136	32,945	135	33,128	136	32,945		
Marshall Islands	63	141	28	63	174	392	13	30	13	30	174	392	14	27	32	60	32	60	32	60	32	60	32	60	32	60	32	60	32	60	32	60	32	60	32	60	
Micronesia	136	141	61	63	378	392	28	30	28	30	378	392	28	30	66	60	66	60	66	60	66	60	66	60	66	60	66	60	66	60	66	60	66	60	66	60	
Mongolia	4,875	220	2,194	99	13,581	613	1,023	46	1,023	46	5,025	194	2,261	87	6,149	237	6,149	237	6,147	237	6,149	237	6,147	237	6,149	237	6,147	237	6,149	237	6,147	237	6,149	237	6,147		
Nauru	5	52	2	23	14	145	1	11	1	11	14	145	2	13	5	36	5	36	5	36	5	36	5	36	5	36	5	36	5	36	5	36	5	36	5	36	
New Caledonia	241	141	108	63	671	392	51	30	51	30	671	392	51	30	137	60	137	60	137	60	137	60	137	60	137	60	137	60	137	60	137	60	137	60	137	60	
New Zealand	356	11	160	5	398	12	398	12	398	12	57	2	57	2	413	11	413	11	418	11	413	11	418	11	413	11	418	11	413	11	418	11	413	11	418		
Niue	1	52	0.5	23	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	3	145	
Northern Mariana Is	62	141	28	63	172	392	12	30	12	30	172	392	12	30	48	60	48	60	48	60	48	60	48	60	48	60	48	60	48	60	48	60	48	60	48	60	
Palau	21	141	10	63	60	392	4	30	4	30	60	392	4	30	12	60	12	60	12	60	12	60	12	60	12	60	12	60	12	60	12	60	12	60	12	60	
Papua New Guinea	10,992	267	4,925	120	30,621	744	2,307	56	2,307	56	13,437	235	6,020	105	30,240	529	30,240	529	30,108	527	30,240	529	30,108	527	30,240	529	30,108	527	30,240	529	30,108	527	30,240	529	30,108		
Philippines	205,495	336	92,457	151	572,431	937	43,126	71	43,126	71	236,885	296	106,580	133	366,171	458	366,171	458	366,079	458	366,171	458	366,079	458	366,171	458	366,079	458	366,171	458	366,079	458	366,171	458	366,079		
Rep. Korea	36,762	86	16,539	39	102,406	239	7,715	18	7,715	18	41,664	87	18,744	39	56,522	118	56,522	118	56,409	118	56,522	118	56,409	118	56,522	118	56,409	118	56,522	118	56,409	118	56,522	118	56,409		
Samoa	83	52	37	23	232	145	17	17	17	17	232	145	17	17	53	30	53	30	53	30	53	30	53	30	53	30	53	30	53	30	53	30	53	30	53	30	
Singapore	1,763	58	789	26	1,967	65	283	9	282	9	1,749	41	783	18	1,806	42	1,806	42	1,786	42	1,806	42	1,786	42	1,806	42	1,786	42	1,806	42	1,786	42	1,806	42	1,786	42	
Solomon Islands	449	141	202	63	1,250	392	129	94	129	94	286	60	288	60	288	60	288	60	288	60	288	60	288	60	288	60	288	60	288	60	288	60	288	60	288	60	
Tokelau	0.8	52	0.4	23	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	2	145	
Tonga	52	52	23	23	144	145	11	11	11	11	144	145	11	11	31	30	31	30	31	30	31	30	31	30	31	30	31	30	31	30	31	30	31	30	31	30	
Tuvalu	5	52	2	23	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	13	145	
Vanuatu	210	141	95	63	586	392	44	30	44	30	586	392	44	30	127	60	127	60	127	60	127	60	127	60	127	60	127	60	127	60	127	60	127	60	127	60	
Viet Nam	133,660	202	59,924	91	372,326	563	28,051	42	28,051	42	144,942	178	64,982	80	194,970	240	194,970	240	193,762	238	194,970	240	193,762	238	194,970	240	193,762	238	194,970	240	193,762	238	194,970	240	193,762		
Wallis & Futuna Is	7	52	3	23	20	145	1	11	1	11	20	145	1	11	4	30	4	30	4	30	4	30	4	30	4	30	4	30	4	30	4	30	4	30	4	30	
WP Region	1,899,047	125	853,229	56	5,175,246	341	5,174,709	341	394,995	26	1,933,054	112	868,388	50	4,081,006	236	4,081,006	236	4,073,485	235	4,081,006	236	4,073,485	235	4,081,006	236	4,073,485	235	4,081,006	236	4,073,485	235	4,081,006	236	4,073,485	235	4,081,006
Bangladesh	269,193	246	121,126	111	810,699	741	810,699	741	71,342	65	360,767	246	162,331	111	719,411	490	719,411	490	719,339	490	719,411	490	719,339	490	719,411	490	719,339	490	719,411	490	719,339	490	719,411	490	719,339		
Bhutan	3,526	208	1,586	94	10,618	626	10,618	626	934	55	2,492	110																									

Country data for the Western Pacific and South East Asia Regions: notification, detection and DOTs coverage, 2003

	Whole Country														DOTs				Non-DOTs								
	Pop thousands	All Cases				New cases				Re-treatment cases				Other	Detection rate				% of pop	Notifications		Non-Notifications					
		number		rate		number		rate		number		rate			number		rate			number		rate		number		rate	
		number	rate	number	rate	number	rate	number	rate	number	rate	number	rate		number	rate	number	rate		number	rate	number	rate	number	rate	number	rate
American Samoa	62	3	5	2	3	0	0	1	1	5	16	24	100	3	5	2	3	24	3	24	—	—	—	—			
Australia	19,731	949	5	113	1	38	316	497	23	—	84	22	63	590	3	48	0	9	359	65	—	—	—	—			
Brunei Darussalam	358	206	58	121	34	136	41	40	4	1	106	138	100	206	58	121	34	138	—	—	—	—	—	—			
Cambodia	14,144	28,216	199	18,923	134	18,923	4,307	4,232	754	28	39	60	100	28,216	199	18,923	134	60	—	—	—	—	—	—			
China	1,304,196	615,868	47	267,414	21	267,414	248,805	30,768	68,881	—	46	45	91	553,677	42	257,287	20	43	62,191	10,127	—	—	—	—			
China, Hong Kong SAR	7,049	5,624	80	1,779	25	3,399	2,932	594	319	1	103	73	100	4,461	63	1,426	20	58	1,163	353	—	—	—	—			
China, Macao SAR	464	371	80	138	30	224	154	47	32	6	97	80	100	350	75	130	28	76	21	8	—	—	—	—			
Cook Islands	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Fiji	839	179	21	70	8	—	49	55	5	—	72	63	100	179	21	70	8	63	—	—	—	—	—	—	—		
French Polynesia	244	50	20	21	9	36	19	5	5	—	69	65	100	50	20	21	9	65	—	—	—	—	—	—	—		
Guam	163	22	14	0	0	39	15	7	0	0	23	0	100	22	14	0	0	0	—	—	—	—	—	—	—		
Japan	127,654	31,638	25	10,843	8	17,316	13,621	6,160	1,014	—	79	60	64	21,350	17	7,212	6	40	10,288	3,631	—	—	—	—	—		
Kiribati	88	284	324	99	113	—	71	110	4	—	540	419	100	284	324	99	113	419	—	—	—	—	—	—	—		
Lao PDR	5,657	2,780	49	1,882	33	2,277	495	317	86	5	31	47	85	2,780	49	1,882	33	47	—	—	—	—	—	—	—		
Malaysia	24,425	15,671	64	7,989	33	—	5,811	1,465	406	20	61	69	100	15,671	64	7,989	33	69	—	—	—	—	—	—	—		
Marshall Islands	53	60	113	20	38	20	22	18	0	0	189	140	100	60	113	20	38	140	—	—	—	—	—	—	—		
Micronesia	109	99	91	27	25	41	51	21	0	0	151	92	90	99	91	27	25	92	—	—	—	—	—	—	—		
Mongolia	2,594	3,918	151	1,541	59	1,541	812	1,419	146	58	78	68	100	3,918	151	1,541	59	68	—	—	—	—	—	—	—		
Nauru	13	3	23	1	8	1	1	1	0	0	77	57	100	3	23	1	8	57	—	—	—	—	—	—	—		
New Caledonia	228	36	16	14	6	19	9	12	1	—	26	23	100	36	16	14	6	23	—	—	—	—	—	—	—		
New Zealand	3,875	386	10	106	3	181	125	136	19	—	94	57	100	386	10	106	3	57	—	—	—	—	—	—	—		
Niue	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	—	—	—	—	—	—	—		
Northern Mariana Is	79	45	57	16	20	30	19	10	0	0	95	75	100	45	57	16	20	75	—	—	—	—	—	—	—		
Palau	20	9	44	5	24	—	2	2	0	0	73	90	100	9	44	5	24	90	—	—	—	—	—	—	—		
Papua New Guinea	5,711	18,405	322	3,231	57	3,231	7,038	6,769	1,367	—	137	54	46	5,607	98	921	16	15	12,798	2,310	—	—	—	—	—		
Philippines	79,999	134,375	168	72,670	91	72,670	55,942	1,693	4,070	—	57	68	100	134,375	168	72,670	91	68	—	—	—	—	—	—	—		
Rep. Korea	47,700	33,888	71	10,976	23	13,062	18,399	1,312	3,201	359	81	59	100	13,463	28	4,379	9	23	20,425	6,597	—	—	—	—	—		
Samoa	178	27	15	12	7	20	8	7	0	0	51	51	100	27	15	12	7	51	—	—	—	—	—	—	—		
Singapore	4,253	1,616	38	586	14	947	645	173	184	12	92	75	100	791	19	341	8	44	825	245	—	—	—	—	—		
Solomon Islands	477	293	61	138	29	138	107	43	5	0	103	107	100	293	61	138	29	107	—	—	—	—	—	—	—		
Tokelau	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	—	—	—	—	—	—	—		
Tonga	104	16	15	11	11	11	3	2	0	0	52	80	100	16	15	11	11	80	—	—	—	—	—	—	—		
Tuvalu	11	30	283	0	0	0	17	8	5	1	954	0	0	—	—	—	—	—	30	0	—	—	—	—	—		
Vanuatu	212	104	49	40	19	40	45	18	1	1	82	70	100	104	49	40	19	70	—	—	—	—	—	—	—		
Viet Nam	81,377	92,741	114	55,937	69	16,791	14,564	5,449	4,491	189	64	86	100	92,741	114	55,937	69	86	—	—	—	—	—	—	—		
Wallis & Futuna Is	15	15	102	7	48	11	7	0	1	1	343	356	90	15	102	7	48	356	—	—	—	—	—	—	—		
WPR	1,732,104	987,927	57	454,732	26	401,765	376,679	70,506	85,982	998	51	52	90	879,827	51	431,396	25	50	108,100	23,336	—	—	—	—	—		
Bangladesh	146,736	88,156	60	53,618	37	56,123	24,913	7,120	2,505	—	24	33	99	88,156	60	53,618	37	33	—	—	—	—	—	—	—		
Bhutan	2,257	1,026	45	360	16	443	284	344	38	19	41	32	100	1,026	45	360	16	32	—	—	—	—	—	—	—		
DPR Korea	22,664	41,810	184	17,392	77	—	18,112	4,606	1,700	1,105	104	96	80	39,396	174	16,445	73	91	2,414	947	—	—	—	—	—		
India	1,065,462	1,073,065	101	433,271	41	419,668	459,424	132,253	48,117	12,206	60	54	67	876,768	79	372,088	35	47	236,297	61,183	—	—	—	—	—		
Indonesia	219,883	178,260	81	92,566	42	—	77,561	4,047	4,086	—	28	33	98	178,260	81	92,566	42	33	—	—	—	—	—	—	—		
Maldives	318	137	43	68	21	0	26	40	3	0	96	106	100	137	43	68	21	106	—	—	—	—	—	—	—		
Myanmar	49,485	75,744	153	27,448	55	—	26,006	17,796	4,494	964	90	73	95	75,744	153	27,448	55	73	—	—	—	—	—	—	—		
Nepal	25,164	30,925	123	14,348	57	—	8,894	5,619	2,064	300	58	60	94	30,925	123	14,348	57	60	—	—	—	—	—	—	—		
Sri Lanka	19,065	8,998	47	4,321	23	4,764	2,650	1,811	216	47	78	83	74	7,307	38	3,652	19	70	1,691	669	—	—	—	—	—		
Thailand	62,833	54,504	87	28,459	45	—	17,596	6,756	1,693	—	61	72	100	54,504	87	28,459	45	72	—	—	—	—	—	—	—		
Timor-Leste	778	2,760	355	1,027	132	—	1,240	473	20	8	64	53	78	2,760	355	1,027	132	53	—	—	—	—	—	—	—		
SEAR	1,614,648	1,555,385	96	672,878	42	480,998	636,706	180,865	64,936	14,649	51	49	77	1,314,983	81	610,079	38	45	240,402	62,799	—	—	—	—	—		
Total	3,346,752	2,543,312	76	1,127,610	34	882,763	1,013,385	251,371	150,918	15,647	51	50	84	2,194,983	78	1,041,475	37	47	348,502	86,135	—	—	—	—	—		

Country data for the Western Pacific and South East Asia Regions: re-treatment outcomes for cases registered in 2002

	Relapse – DOTS										After failure – DOTS										After default – DOTS									
	Number regisrd	% cured	% compl-eted	% died	% failed	% default	% trans-ferred	% not eval	% success	Number regisrd	% cured	% compl-eted	% died	% failed	% default	% trans-ferred	% not eval	% success	Number regisrd	% cured	% compl-eted	% died	% failed	% default	% trans-ferred	% not eval	% success			
American Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Australia	17	24	47	18	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Brunei Darussalam	10	50	20	20	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Cambodia	807	88	3	5	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
China	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
China, Hong Kong SAR	239	61	8	7	3	12	9	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43			
China, Macao SAR	45	64	27	2	2	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Cook Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Fiji	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
French Polynesia	8	100	75	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Guam	3	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Japan	743	74	24	11	7	3	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Kiribati	3	33	67	24	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Lao PDR	117	54	12	9	7	9	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Malaysia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Marshall Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Micronesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Mongolia	134	61	12	8	6	7	5	1	73	66	50	15	5	23	6	2	-	65	26	35	27	12	4	12	12	-	62			
Nauru	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
New Caledonia	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
New Zealand	3	-	67	-	-	-	-	33	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Niue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Northern Mariana Is	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Palau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Papua New Guinea	82	26	26	12	9	16	12	-	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Philippines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Rep. Korea	1,415	67	2	2	2	4	20	2	69	-	-	-	-	-	-	-	-	-	161	58	4	-	2	14	21	1	62			
Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Singapore	65	-	78	12	2	8	-	-	78	-	-	-	-	-	-	-	-	-	22	-	45	9	-	45	-	-	45			
Solomon Islands	2	100	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Tokelau	1	100	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Tonga	1	100	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Tuvalu	1	100	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Vanuatu	1	100	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Viet Nam	5,446	81	6	5	4	2	2	-	87	472	67	1	6	18	4	4	-	68	161	71	7	6	6	8	2	-	100			
Wallis & Futuna Is	5	80	-	-	-	-	-	20	80	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-			
WP Region	9,149	74	8	5	4	3	6	0	82	538	65	3	6	18	4	4	0	67	384	57	10	4	4	13	11	1	67			
Bangladesh	2,485	66	3	4	1	7	2	16	69	365	69	2	4	3	14	4	4	72	1,510	67	2	4	3	15	3	6	69			
Bhutan	37	65	14	5	11	4	5	-	78	19	26	21	8	5	5	-	42	47	29	17	14	v	3	3	-	62	31			
DPR Korea	638	78	5	5	6	4	3	-	83	268	69	6	8	8	4	4	-	76	191	76	7	6	3	4	3	-	83			
India	34,317	73	3	7	6	12	1	-	75	8,727	57	3	8	15	16	1	-	60	41,034	67	4	7	5	16	1	-	71			
Indonesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Maldives	3	100	-	-	-	-	-	-	100	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Myanmar	3,762	67	9	8	3	9	3	-	76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Nepal	1,898	83	2	7	3	3	3	-	84	300	71	1	7	14	5	2	-	71	465	75	3	8	2	8	3	-	79			
Sri Lanka	208	62	5	9	2	20	2	-	67	30	43	10	13	13	17	-	3	53	141	45	6	9	1	38	1	50				
Thailand	1,416	58	7	17	6	8	5	-	64	574	49	6	17	9	12	7	-	55	-	-	-	-	-	-	-	-	-			
Timor-Leste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
SEA Region	44,764	72	3	7	5	11	1	1	75	10,284	58	3	9	14	15	1	0	61	43,370	67	4	7	5	16	1	0	71			
Total	53,913	72	4	7	5	9	2	1	76	10,822	58	3	8	14	15	2	0	61	43,754	67	4	7	5	16	1	0	71			

Country data for the Western Pacific and South East Asia Regions: trends in DOTS treatment success and detection rates, 1994–2003

	DOTS new smear-positive treatment success (%)										DOTS new smear-positive case detection rate (%)									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
American Samoa	—	100	—	—	50	100	100	100	100	100	—	—	—	64	—	34	23	23	12	24
Australia	—	—	—	66	75	84	74	66	78	84	—	—	—	—	23	—	30	24	20	9
Brunei Darussalam	—	—	—	—	85	76	63	56	84	—	—	—	—	—	123	100	111	111	129	138
Cambodia	84	91	94	91	95	93	91	92	92	92	40	34	44	47	53	49	47	47	55	60
China, Hong Kong SAR	94	96	96	96	97	96	93	96	96	96	15	28	32	32	32	29	31	32	30	43
China, Macao SAR	75	—	—	85	85	78	76	78	79	79	—	—	—	—	60	59	57	57	60	58
Cook Islands	—	—	—	81	—	78	89	86	89	89	86	155	194	163	—	93	93	91	79	76
Fiji	90	86	—	50	—	80	—	80	100	100	—	—	—	32	—	—	—	75	39	—
French Polynesia	—	67	95	100	74	85	97	80	82	85	47	49	49	56	91	51	50	61	65	63
Guam	—	—	—	—	94	94	93	71	68	—	—	94	107	91	91	82	—	—	84	65
Japan	—	—	—	—	76	76	70	75	76	—	—	—	—	—	—	—	85	97	67	—
Kiribati	—	—	—	—	83	88	91	86	94	—	—	—	—	—	—	22	22	29	33	40
Lao PDR	—	70	55	62	75	84	82	77	78	84	—	24	33	40	45	40	196	244	329	419
Malaysia	—	69	—	—	90	90	78	79	76	76	64	69	—	—	—	—	73	73	69	69
Marshall Islands	—	—	—	—	83	82	91	86	100	100	—	—	—	59	—	96	66	94	119	140
Micronesia	64	80	—	—	—	95	93	100	91	91	18	30	—	—	—	—	43	24	71	92
Mongolia	59	78	78	86	84	86	87	87	87	87	7	31	31	54	67	62	62	73	74	68
Nauru	—	—	—	—	—	50	25	100	50	—	—	—	—	—	—	216	110	110	112	57
New Caledonia	62	75	—	—	70	77	89	84	85	85	24	31	—	—	30	28	28	28	33	23
New Zealand	—	—	—	—	—	—	30	9	60	—	—	—	—	—	—	—	41	37	48	57
Niue	—	—	—	—	—	—	—	—	100	—	—	—	—	—	—	—	—	—	364	—
Northern Mariana Is	—	—	—	—	—	80	81	71	71	—	—	—	—	—	—	—	117	85	96	75
Palau	64	67	75	—	—	—	—	100	38	—	115	53	97	—	—	—	—	—	156	90
Papua New Guinea	—	60	—	93	72	66	63	67	53	—	—	4	1	7	4	7	7	8	16	15
Philippines	80	—	82	83	84	87	88	88	88	—	—	—	—	10	20	48	57	62	68	68
Rep. Korea	71	76	71	82	—	—	—	—	83	—	34	65	58	—	—	—	—	—	—	23
Samoa	50	80	100	—	86	94	92	77	84	84	48	30	48	—	63	49	43	77	51	51
Singapore	88	86	—	—	—	95	85	88	87	87	57	26	—	—	—	13	13	22	39	44
Solomon Islands	—	65	73	92	92	—	81	89	90	90	—	55	71	91	63	76	85	85	81	107
Tokelau	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tonga	89	75	82	75	94	80	93	92	83	—	48	78	64	97	63	98	98	54	161	80
Tuvalu	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Vanuatu	—	—	—	—	—	88	88	88	79	—	—	—	—	—	36	40	40	77	52	70
Viet Nam	91	91	90	85	93	92	92	93	92	92	30	60	79	83	84	83	83	84	88	86
Wallis & Futuna Is	—	—	—	—	—	—	—	100	100	—	—	—	—	—	—	—	—	—	49	356
WP Region	90	91	93	93	95	94	92	93	91	91	16	28	32	33	31	37	38	38	39	50
Bangladesh	73	71	72	78	80	81	83	84	84	84	7	14	18	23	23	23	23	25	29	33
Bhutan	71	97	96	85	90	85	90	93	86	86	28	24	23	22	26	26	29	31	32	32
DPR Korea	—	—	—	—	91	94	91	91	88	91	—	—	—	—	2	26	26	53	79	91
India	83	79	79	82	84	82	84	85	87	87	—	1	1	2	7	12	12	24	31	47
Indonesia	94	91	81	54	58	50	87	86	86	86	1	5	7	12	18	19	19	20	27	33
Maldives	95	97	93	94	94	94	97	97	95	94	96	97	94	101	101	81	81	79	87	106
Myanmar	—	66	79	82	81	82	81	82	81	82	—	26	26	29	26	48	48	56	65	73
Nepal	—	—	85	87	89	87	86	88	86	86	—	6	11	16	44	56	56	56	57	60
Sri Lanka	77	79	80	76	76	84	77	80	81	81	63	61	71	75	75	68	68	73	71	70
Thailand	—	—	78	62	68	77	69	75	74	74	—	—	5	21	39	46	46	73	65	72
Timor-Leste	—	—	—	—	—	—	—	73	81	—	—	—	—	—	—	—	—	—	59	53
SEA Region	80	74	77	72	72	73	83	84	85	85	2	4	6	8	14	18	18	27	33	45

Country data for the Western Pacific and South East Asia Regions: age and sex distribution of smear-positive cases in DOTs areas, 2003 (absolute numbers)

	Male						Female						All									
	0-14	15-24	25-34	35-44	45-54	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+	
American Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Australia	0	4	3	3	1	12	12	0	6	7	7	2	2	2	0	10	10	3	8	3	8	14
Brunei Darussalam	0	5	25	17	8	9	9	0	9	14	11	4	5	6	0	14	39	28	12	13	13	15
Cambodia	37	805	1,514	2,183	1,848	1,729	1,487	46	691	1,287	1,975	2,208	1,857	1,256	83	1,496	2,801	4,158	4,056	3,586	2,743	2,743
China	1,059	24,199	31,471	30,210	31,370	26,330	31,210	1,350	18,143	18,414	14,147	11,578	8,661	9,145	2,409	42,342	49,885	44,357	42,948	34,991	40,355	40,355
China, Hong Kong SAR	3	94	78	119	167	150	337	8	75	113	86	55	37	104	11	169	191	205	222	187	441	441
China, Macao SAR	0	8	8	16	26	9	23	0	7	7	10	7	4	5	0	15	15	26	33	13	28	28
Cook Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fiji	2	9	7	6	9	5	6	-	5	6	4	4	7	-	-	-	-	-	-	-	-	-
French Polynesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Guam	0	2	2	1	2	4	4	3	3	1	1	1	0	1	-	5	3	2	3	4	4	4
Giam	1	3	1	3	4	7	5	-	4	4	4	2	1	5	1	5	5	7	6	8	10	10
Japan	1	130	335	368	713	956	2,502	2	133	272	153	177	199	1,271	3	263	607	521	890	1,155	3,773	3,773
Kiribati	5	13	5	9	6	6	0	5	20	4	12	7	3	4	10	33	9	21	13	9	4	4
Lao PDR	6	94	186	240	233	202	200	7	78	105	160	161	115	115	13	172	291	400	394	317	295	295
Malaysia	216	1,211	2,010	2,073	1,798	1,438	1,601	196	969	1,044	857	669	584	626	412	2,180	3,054	2,930	2,467	2,022	2,227	2,227
Marshall Islands	6	4	2	7	7	2	2	4	9	4	4	6	1	4	10	13	4	11	13	3	6	6
Micronesia	0	3	2	2	0	2	1	4	4	2	1	1	2	1	4	7	6	3	1	4	4	4
Mongolia	10	206	217	171	93	55	39	19	254	233	148	45	32	19	29	460	450	319	138	87	58	58
Nauru	0	0	0	0	0	0	0	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0
New Caledonia	0	1	1	1	1	1	3	0	0	2	2	10	0	3	0	1	3	3	1	1	6	6
New Zealand	5	9	10	6	6	8	9	7	18	8	1	10	4	5	12	27	18	7	16	12	14	14
Niue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northern Mariana Is	0	2	2	2	1	0	2	1	3	0	2	1	0	1	1	5	2	4	2	0	2	2
Palau	0	0	1	1	1	1	0	1	0	0	1	0	1	2	1	1	0	1	2	1	2	2
Papua New Guinea	15	164	132	83	56	28	6	24	167	148	51	25	17	5	39	331	280	134	81	45	11	11
Philippines	356	6,360	9,302	11,458	10,713	6,445	3,648	300	3,218	4,551	4,761	4,000	2,858	2,018	656	9,578	13,853	16,219	14,713	9,303	5,666	5,666
Rep. Korea	10	401	564	557	493	377	481	13	285	291	174	133	150	450	23	686	855	731	626	527	931	931
Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Singapore	0	10	15	44	70	56	65	0	4	13	13	13	8	30	0	14	28	57	83	64	95	95
Solomon Islands	4	14	9	12	14	8	0	9	14	14	16	13	10	1	13	28	23	28	27	18	1	1
Tokelau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonga	0	1	1	1	1	0	2	0	1	0	1	1	2	0	0	2	1	2	2	2	2	2
Tuvalu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanuatu	1	2	4	7	5	2	3	0	4	4	3	2	1	2	1	6	8	10	7	3	5	5
Viet Nam	49	3,475	7,036	8,486	7,965	5,066	7,793	66	1,659	2,262	2,327	2,574	2,283	4,896	115	5,134	9,298	10,813	10,539	7,349	12,689	12,689
Wallis & Futuna Is	0	0	2	2	0	0	0	0	0	1	0	0	0	0	0	0	0	3	2	0	0	0
WPR	1,785	37,230	52,945	56,086	55,619	42,897	49,449	2,063	25,784	28,810	24,929	21,699	16,846	19,957	3,848	63,014	81,755	81,015	77,318	59,743	69,406	69,406
Bangladesh	320	5,166	7,275	8,058	6,947	5,501	4,142	544	4,298	4,282	3,258	2,086	1,150	591	864	9,464	11,557	11,316	9,033	6,651	4,733	4,733
Bhutan	9	62	50	20	25	20	13	14	57	39	17	13	15	6	23	119	89	37	38	35	19	19
DPR Korea	81	1,101	2,173	2,541	2,340	1,327	562	90	792	1,542	1,531	1,316	723	326	171	1,893	3,715	4,072	3,656	2,050	888	888
India	1,890	42,830	54,948	56,283	47,204	30,256	16,242	4,120	31,332	31,895	19,662	11,520	6,903	3,379	6,010	74,162	86,843	75,945	58,724	37,159	19,621	19,621
Indonesia	532	9,570	12,647	10,925	9,558	6,720	3,615	608	8,734	10,127	7,889	6,085	3,907	1,649	1,140	18,304	22,774	18,814	15,643	10,627	5,264	5,264
Maldives	1	14	7	4	9	9	4	0	8	5	1	5	1	1	1	22	12	5	14	10	4	4
Myanmar	107	2,536	4,408	4,427	3,269	1,974	1,296	154	1,781	2,442	2,003	1,491	943	617	261	4,317	6,850	6,430	4,760	2,917	1,913	1,913
Nepal	122	2,039	1,658	1,619	1,769	1,639	735	189	1,283	1,107	873	609	486	220	311	3,322	2,765	2,492	2,378	2,125	955	955
Sri Lanka	11	286	399	609	665	421	315	12	230	181	148	149	103	103	23	536	580	757	814	524	418	418
Thailand	41	1,636	4,615	4,259	3,497	2,740	3,241	49	944	1,678	1,350	1,279	1,264	1,866	90	2,580	6,293	5,609	4,776	4,004	5,107	5,107
Timor-Leste	5	130	135	107	98	66	41	13	98	116	76	76	43	17	18	228	251	183	174	109	58	58
SEAR	3,119	65,370	88,315	88,852	75,381	50,673	30,206	5,793	49,577	53,414	36,808	24,629	15,538	8,774	8,912	114,947	141,729	125,660	100,010	66,211	38,980	38,980
Total	4,904	102,600	141,260	144,938	131,000	93,570	79,655	7,856	75,361	82,224	61,737	46,328	32,384	28,731	12,760	177,961	223,484	206,675	177,328	125,954	108,386	108,386

Country data for the Western Pacific and South East Asia Regions: age and sex distribution of smear-positive cases in non-DOTS areas, 2003 (absolute numbers)

	Male						Female						All									
	0-14	15-24	25-34	35-44	45-54	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+	
American Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Australia	0	10	7	1	5	4	18	0	3	6	1	3	2	5	0	13	13	2	8	6	23	
Brunei Darussalam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cambodia	74	926	1,289	1,394	1,215	913	817	57	668	834	636	523	327	320	131	1,594	2,123	2,030	1,738	1,240	1,137	
China, Hong Kong SAR	5	10	12	21	28	27	136	2	9	20	15	8	4	56	7	19	32	36	36	31	192	
China, Macao SAR	0	1	1	0	1	0	4	0	0	0	1	0	0	0	0	1	1	1	1	0	4	
Cook Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Fiji	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
French Polynesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Guam	0	80	186	182	350	432	1,229	0	70	123	93	77	114	695	0	150	309	275	427	546	1,924	
Kiribati	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lao PDR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Malaysia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Marshall Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Micronesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mongolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nauru	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
New Caledonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
New Zealand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Niue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Northern Mariana Is	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Palau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Papua New Guinea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Philippines	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Rep. Korea	12	331	644	708	714	615	991	19	396	502	327	232	231	875	31	727	1,146	1,035	946	846	1,866	
Samoa	1	7	13	24	27	24	69	0	2	13	17	7	13	28	1	9	26	41	34	37	97	
Singapore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Solomon Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tokelau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tonga	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tuvalu	4	2	0	1	6	0	0	0	3	0	1	0	0	0	4	5	0	2	6	0	0	
Vanuatu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Viet Nam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Wallis & Futuna Is	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WPR	96	1,367	2,152	2,331	2,346	2,015	3,264	78	1,151	1,498	1,091	850	691	1,979	174	2,518	3,650	3,422	3,196	2,706	5,243	
Bangladesh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bhutan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DPR Korea	5	53	106	137	129	85	72	3	31	81	76	79	46	44	8	84	187	213	208	131	116	
India	521	4,421	6,810	7,304	5,661	3,483	1,776	625	3,179	4,422	3,658	2,535	1,419	606	1,146	7,600	11,232	10,962	8,196	4,902	2,382	
Indonesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Maldives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Myanmar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nepal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sri Lanka	1	25	68	85	126	74	74	2	55	37	38	38	29	17	3	80	105	123	164	103	91	
Thailand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Timor-Leste	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SEAR	527	4,499	6,984	7,526	5,916	3,642	1,922	630	3,265	4,540	3,772	2,652	1,494	667	1,157	7,764	11,524	11,298	8,568	5,136	2,589	
Total	623	5,866	9,136	9,857	8,262	5,657	5,186	708	4,416	6,038	4,863	3,502	2,185	2,646	1,331	10,282	15,174	14,720	11,764	7,842	7,832	

Country data for the Western Pacific and South East Asia Regions: smear-positive notification rates (per 100 000 population) by age and sex, 2003

	Male										Female										All								
	0-14	15-24	25-34	35-44	45-54	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+	
	American Samoa	0	1	1	0	1	0	3	0	1	1	0	0	0	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1
Australia	0	15	72	64	39	96	165	0	28	34	43	27	98	108	0	21	55	54	54	34	96	136	0	34	96	136	0	1	
Brunei Darussalam	1	50	185	321	425	706	1077	2	44	154	253	405	523	466	1	47	170	285	285	414	598	673	1	414	598	673	1	1	
Cambodia	1	23	28	29	39	56	73	1	19	17	14	16	19	18	1	21	22	22	22	28	38	44	1	28	38	44	1	1	
China, Hong Kong SAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
China, Macao SAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cook Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fiji	1	11	11	11	22	21	42	-	6	10	7	10	28	-	1	8	10	9	9	16	25	19	-	16	25	19	-	-	
French Polynesia	-	8	10	5	15	50	54	-	13	5	6	8	0	17	-	11	8	6	6	12	26	35	-	12	26	35	-	-	
Guam	0	15	8	22	39	120	103	4	24	9	36	22	20	101	2	20	9	28	31	73	102	102	0	31	73	102	0	1	
Japan	0	3	5	7	12	16	37	0	3	4	3	3	3	14	0	3	5	5	7	10	24	24	0	7	10	24	0	1	
Kiribati	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lao PDR	1	16	47	87	128	190	212	1	14	26	55	84	93	87	1	15	36	71	105	138	145	145	1	105	138	145	1	1	
Malaysia	5	53	105	126	147	209	323	5	44	56	53	56	87	109	5	49	81	90	102	149	208	208	5	102	149	208	5	1	
Marshall Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Micronesia	0	25	28	35	0	102	57	20	34	53	17	23	96	46	9	29	41	26	11	99	51	51	0	11	99	51	0	1	
Mongolia	2	72	96	99	102	106	92	5	90	104	84	48	59	35	3	81	100	91	75	82	59	59	2	75	82	59	2	1	
Nauru	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Caledonia	0	5	5	6	8	12	49	0	0	11	12	0	0	44	0	3	8	9	4	6	46	46	0	4	6	46	0	1	
New Zealand	1	3	4	2	2	4	4	2	7	3	0	4	2	2	1	5	4	1	3	3	3	3	3	1	3	3	3	1	1
Niue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northern Mariana Is	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Palau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Papua New Guinea	1	28	30	25	27	25	8	2	32	33	16	13	17	8	2	30	32	21	21	21	8	8	2	21	21	8	2	1	
Philippines	2	77	147	250	339	344	276	2	40	74	104	124	147	121	2	59	111	177	230	243	190	190	2	230	243	190	2	1	
Rep. Korea	0	19	28	30	39	50	94	1	19	19	12	12	18	57	1	19	24	21	26	34	72	72	0	26	34	72	0	1	
Samoa	-	10	-	-	-	29	-	-	11	17	30	-	51	41	-	11	7	13	-	41	13	13	-	7	13	41	13	1	
Singapore	0	6	9	17	28	43	88	0	2	9	7	6	11	32	0	4	9	12	17	27	57	57	0	17	27	57	0	1	
Solomon Islands	4	28	24	55	97	84	0	9	30	40	71	91	112	16	6	29	32	63	94	98	8	8	4	32	94	98	4	1	
Tokelau	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tonga	0	9	13	19	29	0	72	0	10	0	19	25	69	0	0	9	7	19	27	37	34	34	0	27	37	34	0	1	
Tuvalu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanuatu	2	9	28	63	65	44	86	0	19	27	26	28	24	60	1	14	27	44	47	34	73	73	2	47	34	73	2	1	
Viet Nam	0	41	103	158	236	297	385	1	20	33	42	74	125	207	0	31	68	99	153	208	289	289	0	68	99	153	208	289	
Wallis & Futuna Is	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WPR	1	27	36	43	55	68	86	1	20	21	20	22	27	29	1	23	29	31	39	48	55	55	1	39	48	55	1	1	
Bangladesh	1	34	62	93	123	183	178	2	30	39	40	39	37	24	2	32	51	68	82	109	100	100	1	82	109	100	1	1	
Bhutan	2	27	33	19	33	38	29	3	25	26	17	17	27	12	2	26	30	18	25	32	19	19	2	25	32	19	2	1	
DPR Korea	3	64	115	148	227	135	100	3	48	85	92	129	68	43	3	56	100	120	178	100	67	67	3	178	100	67	3	1	
India	1	45	71	91	106	108	70	3	36	46	36	30	26	14	2	41	59	65	69	67	40	40	2	69	67	40	2	1	
Indonesia	2	44	67	74	94	108	71	2	41	54	54	60	56	26	2	43	60	64	77	80	46	46	2	77	80	46	2	1	
Maldives	1	41	32	25	90	132	69	0	24	24	7	49	19	0	1	33	28	17	69	89	36	36	1	69	89	36	1	1	
Myanmar	1	52	106	147	151	149	123	2	37	58	64	65	66	49	2	45	82	105	107	106	83	83	1	107	106	83	1	1	
Nepal	2	80	90	122	198	276	169	4	54	67	68	68	78	44	3	67	72	72	95	133	174	174	3	95	133	174	3	1	
Sri Lanka	1	17	30	47	68	63	58	1	18	15	14	19	21	18	1	17	22	31	46	44	38	38	1	46	44	38	1	1	
Thailand	1	29	83	93	107	137	194	1	17	29	27	36	59	89	1	23	56	59	70	96	135	135	1	70	96	135	1	1	
Timor-Leste	3	131	265	224	300	331	363	9	111	319	168	248	211	142	6	121	287	197	275	270	250	250	3	275	270	250	3	1	
SEAR	1	44	72	91	109	117	85	3	35	47	41	38	35	22	2	40	60	67	75	76	51	51	2	75	76	51	2	1	
Total	1	32	51	67	83	106	108	2	26	31	30	30	33	28	1	29	41	49	58	70	66	66	1	58	70	66	1	1	

Country data for the Western Pacific and South East Asia Regions: number of TB cases notified, 1980-2003

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
American Samoa	2	6	8	8	12	5	8	9	13	13	5	9	3	4	4	4	0	6	3	4	3	3	2	3
Australia	1,457	1,386	1,270	1,219	1,299	1,088	906	907	954	952	1,016	1,016	1,011	991	1,057	1,073	—	1,145	899	1,073	1,043	980	1,013	949
Brunei Darussalam	196	285	245	276	256	238	212	189	126	128	143	—	180	160	—	—	—	160	—	272	307	216	230	206
Cambodia	2,576	1,980	8,158	7,572	10,241	10,145	10,235	9,106	10,691	7,906	6,501	10,903	16,148	13,270	15,172	14,603	14,857	15,629	16,946	19,266	18,891	19,170	24,610	28,216
China	0	—	98,654	117,557	151,564	226,899	265,095	251,600	304,639	310,607	375,481	345,000	320,426	344,218	363,804	515,764	504,758	466,394	445,704	449,518	454,372	470,221	462,609	615,868
China, Hong Kong SAR	8,065	7,729	7,527	7,301	7,843	7,545	7,432	7,269	7,021	6,704	6,510	6,283	6,545	6,537	6,319	0	6,501	7,072	7,673	7,512	7,578	7,262	6,244	5,624
China, Macao SAR	1,101	585	233	455	671	571	420	389	320	274	343	329	294	285	—	402	570	575	465	449	449	465	388	371
Cook Islands	37	10	19	29	20	36	17	16	20	20	1	8	12	6	4	—	0	0	1	3	2	2	1	0
Fiji	210	180	163	185	165	230	199	173	162	218	226	247	240	183	280	203	200	171	166	192	144	183	150	179
French Polynesia	76	66	66	78	80	78	85	80	83	73	59	49	83	78	89	—	86	91	105	93	62	62	64	50
Guam	55	41	49	48	54	37	49	34	44	75	112	—	60	70	94	—	—	—	—	—	54	63	51	22
Japan	70,916	65,867	63,940	62,021	61,521	58,567	56,690	56,496	54,357	53,112	51,821	50,612	48,956	48,461	44,425	43,078	42,122	42,190	44,016	40,800	39,384	35,489	32,828	31,638
Kiribati	146	187	193	127	111	103	129	110	208	121	68	91	100	99	253	—	327	464	276	255	252	189	196	284
Lao PDR	7,630	—	4,706	4,700	6,528	4,258	1,514	3,468	7,279	2,952	1,826	1,951	994	2,093	1,135	830	1,440	1,923	2,153	2,434	2,234	2,418	2,621	2,780
Malaysia	11,218	10,970	11,944	11,634	10,577	10,569	10,735	11,068	10,944	10,686	11,702	11,059	11,420	12,285	11,708	11,778	12,691	13,539	14,115	14,908	15,057	14,830	14,389	15,671
Marshall Islands	6	7	12	15	12	15	37	32	11	7	—	26	52	61	—	—	59	—	49	41	34	56	51	60
Micronesia	0	67	73	75	66	60	60	98	77	68	367	350	111	151	173	172	126	107	123	104	91	104	127	99
Mongolia	1,161	1,094	1,340	1,512	1,651	2,992	2,818	2,432	2,541	2,237	1,577	1,611	1,502	1,433	1,730	2,780	3,457	2,987	2,915	3,348	3,109	3,526	3,829	3,918
Nauru	0	2	8	0	0	0	8	6	8	0	7	—	—	—	4	—	—	—	—	2	—	3	5	3
New Caledonia	108	128	120	171	144	104	98	74	111	128	143	140	140	104	97	87	104	88	90	78	94	61	65	36
New Zealand	474	448	437	415	404	359	320	296	295	303	348	335	317	274	352	391	352	321	365	447	344	377	329	386
Niue	1	0	2	3	0	0	5	0	3	—	—	—	—	1	2	0	2	0	0	0	0	0	0	0
Northern Mariana Is	0	26	75	74	58	64	16	56	27	28	28	—	67	—	46	48	51	93	97	66	75	58	53	45
Palau	17	10	17	14	20	26	13	38	17	3	—	6	4	25	41	19	5	15	—	32	—	11	—	9
Papua New Guinea	2,525	2,508	2,742	2,955	3,505	3,453	2,877	2,251	4,261	3,396	2,497	3,401	2,540	7,451	5,335	8,041	5,097	7,977	11,291	13,067	12,121	15,897	5,324	18,405
Philippines	112,307	116,821	104,715	106,300	151,863	151,028	153,129	163,740	183,113	217,272	317,008	207,371	236,172	178,134	180,044	119,186	165,453	195,767	162,360	145,807	119,914	107,133	118,408	134,375
Rep. Korea	89,803	98,532	100,878	91,572	85,669	87,169	88,789	87,419	74,460	70,012	63,904	57,864	48,070	46,999	38,155	42,117	39,315	33,215	34,661	32,075	21,782	37,268	34,967	33,888
Samoa	59	49	43	41	37	43	65	29	29	37	44	44	26	49	45	45	31	31	22	22	43	31	27	27
Singapore	2,710	2,425	2,179	2,065	2,143	1,952	1,760	1,616	1,666	1,617	1,591	1,841	1,778	1,830	1,677	1,889	1,951	1,977	2,120	1,805	1,728	1,536	1,516	1,616
Solomon Islands	266	313	324	302	337	377	292	334	372	488	382	309	364	367	332	352	299	318	295	289	302	292	256	293
Tokelau	0	0	0	0	2	0	2	0	9	1	1	1	1	1	0	2	0	—	—	—	0	0	0	0
Tonga	64	49	45	50	54	49	35	24	14	36	23	20	29	33	23	30	22	21	30	22	24	12	29	16
Tuvalu	33	18	12	23	9	32	27	22	24	26	23	30	30	28	19	36	36	—	18	14	16	16	13	30
Vanuatu	178	92	173	196	188	124	131	90	118	144	140	230	193	114	152	79	126	184	178	120	152	175	101	104
Viet Nam	43,062	43,506	51,206	43,185	43,875	46,941	47,557	55,505	52,463	52,270	50,203	59,784	56,594	52,994	51,763	55,739	74,711	77,838	87,468	88,879	89,792	90,728	95,044	92,741
Wallis & Futuna Is	23	24	5	17	14	14	14	34	34	1	30	22	4	11	11	6	8	14	—	—	—	—	19	15
WPR	356,482	355,345	461,572	462,193	541,001	615,179	651,853	655,019	716,450	741,916	893,992	760,870	754,466	718,799	724,345	818,740	874,721	870,313	834,604	822,454	789,457	808,817	805,578	987,927
number reporting	36	33	36	36	36	36	36	36	36	35	33	33	33	33	33	28	31	31	31	33	35	35	35	36
percent reporting	100	92	100	100	100	100	100	100	100	97	92	86	97	92	92	78	86	86	86	92	92	97	97	100
Bangladesh	39,774	42,644	49,870	52,961	45,679	41,802	45,599	45,355	44,280	45,191	48,673	56,032	31,400	54,000	48,276	56,437	63,471	63,420	72,256	79,339	75,557	76,302	81,963	88,156
Bhutan	1,539	2,657	720	1,017	904	1,073	1,582	608	1,126	1,525	1,154	996	140	108	1,159	1,299	1,271	1,211	1,292	1,174	1,140	1,037	1,089	1,026
DKP Korea	0	—	—	—	—	—	—	—	0	—	—	—	—	—	—	—	—	11,050	1,152	12,287	34,131	29,284	40,159	41,810
India	705,600	769,540	923,095	1,075,098	1,109,310	1,168,804	1,279,536	1,403,122	1,457,288	1,510,500	1,519,182	1,555,353	1,121,120	1,081,279	1,114,374	1,218,183	1,290,343	1,132,859	1,102,002	1,218,743	1,115,718	1,085,075	1,060,951	1,073,065
Indonesia	25,235	32,461	33,000	31,809	32,432	17,681	16,750	—	97,505	105,516	74,470	60,808	98,458	62,966	49,647	35,529	24,647	22,184	40,497	69,064	84,591	92,792	155,188	178,260
Maldives	73	112	111	143	123	91	111	115	85	203	152	123	92	175	249	231	212	173	176	153	132	139	125	137
Myanmar	12,744	12,461	12,069	11,012	11,045	10,506	10,840	11,986	9,348	10,940	12,416	14,905	17,000	19,009	15,583	18,229	22,201	17,122	14,756	19,626	30,840	42,838	57,012	75,744
Nepal	1,020	337	1,459	700	52	252	1,012	1,012	1,603	11,003	10,142	8,983	13,161	15,572	19,804	22,970	24,158	24,135	27,356	29,519	29,519	29,519	30,359	30,925
Sri Lanka	6,212	6,288	7,334	6,666	6,376	5,889	6,596	6,411	6,092	6,429	6,666	6,174	6,802	6,809	6,132	5,710	5,366	6,542	6,925	7,157	8,413	7,499	8,939	8,998

Country data for the Western Pacific and South East Asia Regions: case notification rates (per 100 000 population), 1980–2003

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
American Samoa	6	18	17	22	32	13	20	21	29	11	19	6	2	8	8	0	0	11	5	7	5	5	3	5
Australia	10	9	8	8	8	7	6	6	6	6	6	6	6	6	6	6	6	6	5	6	5	5	5	5
Brunei Darussalam	102	143	120	131	118	107	92	80	52	51	56	—	66	57	—	—	—	51	5	83	92	63	66	58
Cambodia	39	29	116	103	132	125	122	104	118	84	67	108	155	123	136	127	126	129	136	150	144	142	178	199
China	—	—	10	11	14	21	24	23	27	27	33	29	27	29	30	42	41	38	36	36	36	37	36	47
China, Hong Kong SAR	160	150	144	135	138	135	131	125	119	112	114	109	112	110	104	0	103	110	117	112	111	105	89	80
China, Macao SAR	437	226	87	163	229	186	131	117	92	76	92	86	75	72	107	98	136	134	107	100	100	102	84	80
Cook Islands	207	56	108	165	114	204	96	90	111	6	5	43	64	32	21	0	0	0	5	16	11	11	5	0
Fiji	33	28	24	27	24	32	28	24	23	30	31	34	33	24	37	26	26	22	21	24	18	22	18	21
French Polynesia	50	42	41	47	47	45	48	44	34	38	30	25	41	38	42	—	39	41	46	41	27	26	27	20
Giam	52	38	44	42	46	31	40	27	32	57	—	—	43	50	66	—	—	—	—	—	35	40	32	14
Japan	61	56	54	52	51	48	47	46	44	43	42	41	39	39	36	34	33	33	35	32	31	28	26	25
Kiribati	252	317	321	207	177	161	197	164	303	172	95	125	135	131	330	—	414	578	339	308	300	222	227	324
Lao PDR	238	—	141	137	185	118	41	91	186	73	44	46	23	47	25	18	30	39	43	47	42	45	47	49
Malaysia	82	78	82	78	69	67	67	67	65	61	66	60	61	64	59	58	61	63	64	66	65	63	60	64
Marshall Islands	20	22	36	43	33	40	94	79	26	16	—	57	113	131	—	—	122	—	98	81	67	108	97	113
Micronesia	—	—	86	90	90	77	68	109	84	72	381	354	110	146	164	161	117	99	115	—	85	97	117	91
Mongolia	70	64	76	84	89	157	143	120	121	103	71	71	65	61	131	116	143	123	119	135	124	139	150	151
Nauru	0	26	104	0	0	0	96	70	90	0	74	—	—	—	38	—	—	—	—	17	33	24	39	23
New Caledonia	76	88	81	114	94	67	62	46	68	76	84	80	78	57	51	45	53	44	44	37	44	28	29	16
New Zealand	15	14	14	13	13	11	10	9	9	9	10	10	9	8	10	11	10	9	10	12	9	10	9	10
Niue	29	0	64	101	35	0	192	0	123	0	0	—	90	46	92	95	0	0	0	49	0	0	203	0
Northern Mariana Is	—	140	370	331	233	232	52	164	72	69	64	—	137	87	87	87	153	152	152	99	107	79	70	57
Palau	140	81	135	108	151	191	93	266	117	20	20	39	25	153	245	111	28	83	—	170	—	—	55	44
Papua New Guinea	78	76	81	85	98	94	77	59	109	85	61	81	59	167	117	171	106	161	222	251	227	291	95	322
Philippines	234	237	207	205	287	278	276	288	314	364	519	332	369	272	269	174	237	274	223	196	158	139	151	168
Rep. Korea	236	255	257	230	212	214	215	210	177	165	149	134	110	106	86	94	87	72	75	69	47	79	74	71
Samoa	38	32	28	26	24	27	41	18	18	23	27	27	16	30	27	27	19	19	13	18	25	13	18	15
Singapore	112	98	86	80	81	72	64	57	58	55	53	59	56	56	50	54	54	53	56	46	43	37	36	38
Solomon Islands	116	132	132	119	128	139	104	115	124	158	120	94	107	105	92	94	77	80	72	68	69	65	55	61
Tokelau	0	64	0	0	0	121	0	546	61	0	62	63	64	—	0	131	0	—	—	0	0	0	—	0
Tonga	66	50	46	51	56	50	36	25	14	36	23	20	29	33	23	20	22	21	30	22	24	12	28	15
Tuvalu	441	235	154	291	112	393	327	262	281	299	260	334	329	303	202	378	—	—	181	139	157	155	124	283
Vanuatu	152	77	141	156	146	94	97	65	83	99	94	150	122	70	91	46	71	101	95	63	77	87	49	49
Viet Nam	81	80	93	76	76	79	79	90	83	81	76	89	82	75	72	77	101	104	115	115	115	115	118	114
Wallis & Futuna Is	208	209	42	139	112	109	79	256	7	220	159	159	29	79	78	43	57	98	—	—	—	—	130	102
WPR	27	27	34	34	39	44	46	45	49	50	59	49	48	46	45	51	54	53	50	49	47	47	57	
Bangladesh	47	49	56	58	48	43	46	45	43	42	44	50	27	46	40	46	50	49	55	59	55	54	57	60
Bhutan	117	197	52	72	62	72	104	39	70	92	68	58	8	6	65	72	69	64	66	59	55	49	50	45
DPR Korea	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	51	5	56	153	131	178	184
India	102	109	129	147	148	153	164	176	179	182	179	180	127	121	122	131	136	117	112	122	110	105	101	101
Indonesia	17	21	21	20	20	11	10	10	55	59	41	33	52	33	26	18	12	11	20	33	40	43	71	81
Madhes	46	69	66	83	69	50	59	59	42	97	70	55	40	74	102	92	82	65	64	54	45	46	40	43
Myanmar	38	36	34	31	30	28	29	31	24	27	31	36	41	45	36	41	50	38	32	42	65	89	117	153
Nepal	7	2	9	4	1	0	1	6	9	60	54	47	—	66	76	95	107	110	107	119	126	123	123	123
Sri Lanka	43	43	49	44	41	38	42	40	37	39	40	36	39	39	35	32	30	36	38	39	45	40	47	47
Thailand	99	105	101	134	139	153	101	99	95	83	86	80	85	88	84	79	68	51	27	49	56	81	80	87
Timor-Leste	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	355
SEAR	80	85	98	111	111	113	119	125	134	137	133	133	99	94	93	99	102	89	96	92	90	94	96	
Total	50	53	63	69	72	75	79	81	88	90	93	87	71	68	67	73	77	70	67	71	69	70	76	

Country data for the Western Pacific and South East Asia Regions: new smear-positive cases, 1993–2003

	Number of cases													Rate (per 100 000 population)												
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003				
American Samoa	1	4	—	—	0	6	2	2	2	1	2	2	2	2	0	11	4	5	3	3	2	3				
Australia	557	—	—	—	—	226	203	251	228	210	113	3	3	3	—	0	1	2	1	1	1	1				
Brunei Darussalam	68	—	—	—	—	0	—	84	95	112	121	24	24	24	—	0	—	31	25	28	32	34				
Cambodia	84,898	11,058	11,101	12,065	12,686	13,865	15,744	14,822	14,361	17,258	18,923	7	9	9	102	104	111	123	113	107	125	134				
China	104,729	134,488	203,670	203,670	236,021	202,817	201,775	204,765	204,591	194,972	267,414	7	9	11	17	19	16	16	16	16	15	21				
China, Hong Kong SAR	2,429	—	1,677	1,774	1,943	2,091	2,020	1,940	1,857	1,890	1,779	41	—	27	28	30	32	30	28	27	27	25				
China, Macao SAR	108	—	141	258	325	276	—	160	157	147	138	27	—	34	61	76	63	—	36	34	32	30				
Cook Islands	4	1	—	—	0	0	—	0	2	1	1	0	—	1	0	0	5	0	0	11	5	0				
Fiji	58	60	68	69	66	74	65	62	73	75	70	8	8	9	9	8	9	8	8	9	9	8				
French Polynesia	—	38	—	37	41	34	33	33	29	0	28	21	—	18	17	18	15	14	12	0	12	9				
Guam	—	40	—	—	—	—	—	43	47	31	0	—	28	—	—	—	—	—	28	30	19	0				
Japan	17,890	16,770	14,367	12,867	13,571	11,935	12,909	11,853	11,408	10,807	10,843	14	13	11	10	11	9	10	9	9	8	8				
Kiribati	99	184	—	144	50	52	59	54	64	82	99	131	240	10	182	62	64	71	64	75	95	113				
Lao PDR	—	—	478	886	1,234	1,494	1,719	1,526	1,563	1,829	1,882	—	—	10	18	25	30	33	29	29	33	33				
Malaysia	6,954	6,861	6,688	7,271	7,496	7,802	8,207	8,156	8,309	7,958	7,989	36	35	33	35	35	36	35	35	35	33	33				
Marshall Islands	12	—	—	12	11	11	17	11	15	18	20	26	—	—	25	—	22	34	22	29	34	38				
Micronesia	—	—	9	769	1,171	1,356	1,513	1,389	1,631	1,670	1,541	4	6	8	13	8	13	—	14	7	20	25				
Mongolia	86	145	455	769	1,171	1,356	1,513	1,389	1,631	1,670	1,541	4	6	19	32	48	55	61	56	65	65	59				
Nauru	—	2	—	—	—	—	2	4	2	2	1	—	19	—	—	—	—	17	33	16	16	8				
New Caledonia	16	28	21	26	24	26	22	20	19	21	14	9	15	11	13	12	13	10	9	9	6	6				
New Zealand	91	61	78	90	83	106	94	74	68	88	106	3	2	2	2	2	3	3	2	2	2	3				
Niue	0	0	0	1	0	0	1	0	0	1	0	0	0	0	47	0	0	49	0	0	51	0				
Northern Mariana Is	—	—	14	26	21	26	15	27	19	21	16	—	—	25	45	34	41	22	39	26	28	20				
Palau	8	11	9	4	7	—	20	—	—	9	5	49	66	52	39	39	—	106	—	—	45	24				
Papua New Guinea	—	—	1,652	652	1,195	2,107	1,914	2,267	1,122	926	3,231	—	—	35	14	24	41	41	43	22	17	57				
Philippines	92,279	87,401	94,768	86,695	80,163	69,476	73,373	67,056	59,341	65,148	72,670	141	131	139	124	112	95	99	89	77	83	91				
Rep. Korea	16,630	13,266	11,754	11,420	9,957	10,359	9,559	8,216	11,805	11,345	10,976	38	30	26	25	22	22	21	18	25	24	23				
Samoa	21	18	15	9	14	7	17	13	11	19	12	13	11	9	5	8	4	10	8	6	6	7				
Singapore	513	861	455	519	436	482	465	248	357	549	586	16	26	13	14	12	13	12	6	9	13	14				
Solomon Islands	155	114	109	90	113	140	93	109	118	108	138	44	31	29	23	28	34	22	25	26	23	29				
Tokelau	—	0	1	0	0	—	0	0	0	—	0	—	0	0	0	—	—	0	0	0	—	0				
Tonga	16	17	9	14	11	16	10	15	8	23	11	16	17	9	14	11	16	10	15	8	22	11				
Tuvalu	2	1	6	—	—	—	0	0	0	0	0	22	11	63	—	—	—	0	0	0	0	0				
Tuvalu	—	—	30	50	66	38	43	63	57	38	40	—	37	17	28	36	20	22	32	28	18	19				
Viet Nam	—	—	37,550	48,911	50,016	54,889	53,805	53,169	54,238	56,811	55,937	—	—	52	66	67	72	70	68	68	71	69				
Wallis & Futuna Is	—	—	3	3	1	—	—	—	1	1	7	—	—	21	21	7	—	—	—	7	7	48				
WPR	222,895	241,732	315,946	388,346	416,952	379,699	383,884	376,443	371,577	372,221	454,732	14	15	20	24	25	23	23	22	22	22	26				
Bangladesh	18,993	1,710	20,524	29,674	33,117	37,737	37,821	38,484	40,777	46,811	53,618	16	16	17	23	26	29	28	28	29	33	37				
Bhutan	—	352	367	308	284	270	315	347	359	364	360	—	20	20	17	15	14	16	17	17	17	16				
DPR Korea	—	—	—	—	3,980	403	5,073	16,440	14,429	18,576	17,392	—	—	—	—	18	2	23	74	64	82	77				
India	225,256	226,543	264,515	290,953	274,877	278,275	345,150	349,374	384,827	395,833	433,271	25	25	28	31	28	28	35	34	37	38	41				
Indonesia	62,966	49,647	31,768	11,790	19,492	32,280	49,172	52,338	53,965	76,230	92,566	33	26	16	6	10	16	24	25	25	35	42				
Maldives	126	125	114	106	95	88	88	65	59	60	68	53	51	46	41	36	32	31	22	20	19	21				
Myanmar	—	—	8,681	9,716	9,695	10,089	11,458	17,254	21,161	24,162	27,448	—	—	20	22	21	22	24	36	44	49	55				
Nepal	6,679	10,442	8,591	10,365	11,323	11,306	13,410	13,683	13,683	13,714	14,348	33	51	41	48	52	50	58	58	57	56	57				
Sri Lanka	3,335	3,405	3,049	2,958	3,506	3,761	3,911	4,314	4,316	4,297	4,321	19	19	17	16	16	21	21	23	23	23	23				
Thailand	—	20,260	20,273	16,997	13,214	7,962	14,934	17,754	28,363	25,593	28,459	—	35	35	29	22	13	25	29	46	41	45				
Timor-Leste	—	—	—	—	—	—	—	—	—	1,090	1,027	—	—	—	—	—	—	—	—	—	—	148				
SEAR	317,355	312,484	357,882	372,867	369,583	382,171	481,332	510,053	561,939	606,730	672,878	23	22	25	26	25	26	32	33	36	38	42				
Total	540,250	554,216	673,828	761,213	786,533	761,870	865,216	886,496	933,516	978,951	1,127,610	18	18	22	25	25	24	27	28	28	30	34				

Country data for tuberculosis drug resistance

	New cases					Previously treated cases	
	Year	No	INH	Any	MDR	No	MDR
WPR							
Australia	2001	770	5.6	9.9	1.6	–	–
Cambodia	2001	638	4.7	10.3	0	96	3.1
China							
Hong Kong	2001	3470	2.3	10.2	0.8	169	11.2
Henan	2001	1222	3.3	29.8	7.8	265	36.6
Hubei	1999	859	3.7	17.5	2.1	238	21.8
Liaoning	1999	818	5.4	42.1	10.4	86	24.4
Inner Mongolia	2003	806	5	35	7.3	–	–
Zhejiang	1998	802	2.7	14.8	4.5	140	35
Korea	1998	2370	4.9	10.6	2.2	283	7
Japan	1997	1374	2	10.3	0.9	264	19.7
Malaysia	1996	1001	1	4.2	0	16	0
Mongolia	1999	405	4.4	29.4	1	–	–
New Zealand	2001	272	4.4	11.4	0	22	0
Singapore	2001	823	1.6	5	0.5	126	8
Viet Nam	1996	640	6.7	32.5	2.3	–	–
SEAR							
India							
North Arcot	1999	282	12.8	23.7	2.8	–	–
Raichur District	1999	278	12.2	21.9	2.5	–	–
Wardha District	1999	197	10.7	19.8	0.5	–	–
Nepal	2001	755	1.6	11	1.3	171	20.5
Thailand	2001	1505	5.3	14.8	0.9	–	–
Myanmar	2003	733	–	30.2	4	172	20.3

Annex 1 Definitions²¹

1. Definitions of Tuberculosis Cases

A case of tuberculosis. A patient in whom tuberculosis has been bacteriologically confirmed, or diagnosed by a clinician. Any person given treatment for tuberculosis should be recorded.

All types: The sum of new smear-positive pulmonary, relapse, new smear-negative pulmonary and extrapulmonary cases.

New smear-positive pulmonary tuberculosis: A patient who has never received treatment for tuberculosis or has taken anti-tuberculosis drugs for less than 30 days and who has one of the following:

- two or more initial sputum smear examinations positive for acid fast bacilli (AFB); or
- one sputum examination positive for AFB plus radiographic abnormalities consistent with active pulmonary tuberculosis as determined by a clinician; or
- one sputum specimen positive for AFB and at least one sputum that is culture positive for AFB.

New smear-negative pulmonary tuberculosis: A case of pulmonary tuberculosis that does not meet the above definition for smear-positive tuberculosis:

Extrapulmonary tuberculosis: Tuberculosis of organs other than the lungs: e.g. pleura, lymph nodes, abdomen, genito-urinary tract, skin, joints, bones, meninges, etc. Diagnosis should be based on one culture-positive specimen, or histological or strong clinical evidence consistent with active extrapulmonary tuberculosis, followed by a decision by a clinician to treat with a full course of anti-tuberculosis chemotherapy. (A patient diagnosed with both pulmonary and extrapulmonary tuberculosis should be classified as a case of pulmonary tuberculosis.)

Retreatment cases: Patient previously treated for tuberculosis, undergoing treatment for a new episode of bacteriologically-positive (sputum smear or culture) tuberculosis.

Relapse: A patient previously treated for tuberculosis and declared cured or treatment completed, who is later diagnosed with bacteriologically-positive (culture smear) tuberculosis.

²¹ WHO, IUATLD, KNCV. Revised international definitions in tuberculosis control. Int J Tuberc Lung Dis 2001; 5: 213-215.

2. Definitions of Treatment Outcome

Cured: Initially smear-positive patient who was smear-negative in the last month of treatment, and on at least one previous occasion.

Completed treatment: A patient who has completed treatment but who does not meet the criteria to be classified as a cure or a failure.

Treatment success: The sum of patients who are cured and those who have completed treatment.

Died: A patient who dies for any reason during the course of treatment.

Failure: Smear-positive patient who remained smear-positive at five months or later during treatment.

Defaulted: A patient who has interrupted treatment for two consecutive months or more.

Transferred out: A patient who has been transferred to another recording and reporting unit and for whom the treatment outcome is not known.

Not evaluated: Patient who did not have the treatment outcome evaluated.

Note: In countries where culture is current practice, patients can be classified as cured or failure on the basis of culture results.

3. Indicators to Assess Treatment Outcome

Cure rate: Proportion of cured cases out of all cases registered in a certain period (in 2002 in this report).

Treatment success rates: The sum of the proportion of patients who were cured and patients who completed treatment out of all cases registered in a certain period. The global target is a 85% cure rate and a greater treatment success rate.

The cure rate and treatment success rate are expressed as a percentage of registered cases. The number of new cases registered for treatment in 2003 (reported in 2004) is compared to the number of cases notified as smear-positive in 2002 (reported in 2003). Differences may arise because NTPs do not compile data at the end of each calendar year, diagnoses may be incorrect, patients are lost between diagnosis and the start of treatment, or lost records. All registered cases should be evaluated. Data on the six standard, mutually exclusive outcomes of treatment are compiled. These figures are reported as percentages of all registered cases, so that the possible outcomes plus the fraction of cases not evaluated sum up to 100%. When a country states the number of patients registered for treatment, but gives no outcomes, no result is reported rather than zero treatment success. Although treatment outcomes are expressed as percentages, they are referred to as rates. The six possible outcomes plus the fraction of cases not evaluated sum up to 100%. If the number of registered cases is lower than the sum of the six outcomes or is missing, the denominator for treatment success will be the number evaluated or the number of smear-positive cases notified in the previous year, whichever is greater.

4. Case-detection Rate and DOTS Detection Rate

DOTS. The recommended strategy for tuberculosis control. It comprises:

- Government commitment to ensuring sustained, comprehensive tuberculosis control activities.
- Case detection by sputum smear microscopy among symptomatic patients self-reporting to health services.
- Standardized short-course chemotherapy using regimens of six to eight months, for at least all confirmed smear-positive cases. Good case management includes DOT during the intensive phase for all new sputum smear-positive cases, the continuation phase of rifampicin-containing regimens and the whole re-treatment regimen.
- A regular, uninterrupted drug supply of all essential anti-tuberculosis drugs.
- A standardized recording and reporting system that allows assessment of case-finding and treatment results for each patient and of the tuberculosis control programme performance overall.

Targets for tuberculosis control established by the World Health Assembly:

- To cure 85% of the sputum smear-positive tuberculosis cases detected.
- To detect 70% of the estimated new sputum smear-positive tuberculosis cases.

Case notifications represent only a fraction of the true number of cases in a country because the coverage by effective NTPs may be incomplete.

The estimated case detection rate is defined as:

$$\text{Case-detection rate (\%)} = \frac{\text{Annual new smear-positive notifications (country)}}{\text{Estimated annual new smear-positive incidence (country)}}$$

DOTS detection rate refers to case detection under DOTS:

$$\text{DOTS detection rate (\%)} = \frac{\text{Annual new smear-positive notifications under DOTS}}{\text{Estimated annual new smear-positive incidence (country)}}$$

The case-detection rate and DOTS detection rate are identical when a country has a 100% DOTS enrolment rate. Updated estimated incidence for 2003 used in this report was provided by WHO.

Population with access to DOTS: The country's population that lives in administrative areas where DOTS services are available..

DOTS enrolment rate (%): This indicates a proportion of cases enrolled in DOTS out of notified cases.

$$\text{DOTS enrolment rate (all types) (\%)} = \frac{\text{Annual notifications of all types under DOTS}}{\text{Total of annual notifications of all types}}$$

$$\text{DOTS enrolment rate (New S+) (\%)} = \frac{\text{Annual notification of new S+ under DOTS}}{\text{Total of annual notifications of new S+}}$$

Annex 2

Formulas for Estimating Tuberculosis Incidence, Prevalence and Deaths

Source: Corbett EL, Watt CJ, Walker N et al. The Growing Burden of Tuberculosis. Global Trends and Interactions With the HIV Epidemic. Arch Int Med 2003; 163(9): 1009-1021.

Formulas	Definitions
1. $I = T/d$ and $I_s = T_s/d_s$	N = Population I = Incidence of TB (No. of new Cases of TB per year)
2. $P = tI$ and $P_s = t_s I_s$	P = Prevalence of TB
3. $I_s/N = \lambda k$	T = TB case notifications (per year) D = Deaths from TB
4. $D = fI$ and $D_s = f_s I_s$	IRR = TB incidence rate ratio (TB incidence rate in Human Immunodeficiency [HIV]-Positive persons/TB incidence in HIV-Negative persons)
5. $I = I_a^* + I_a^- + I_n$ or $I = m_a^+ r_a^+ N_a^+ + m_a^- r_a^- N_a^- + m_a r_a N_a$	d = Proportion of cases notified (Case detection rate) t = Average duration of TB disease (Years) λ = Rate of infection with <i>Mycobacterium tuberculosis</i> (MTB) (Annual rate of infection per person per year) k = Ratio of incidence of smear-positive TB to rate of MTB Infection
6. $IRR = m_a^+ r_a^+ / m_a^- r_a^- = (I_a^+ / N_a^+) / (I_a^- / N_a^-)$	t = Proportion of TB patients who die from TB (Case fatality rate [CFR]) m = Prevalence of infection with MTB
7. $I_a^+ / I_a^- = IRR (N_a^+ / N_a^-) / [1 + (N_a^- / N_a^+) (IRR - 1)]$	r = Rate of progression to TB disease in MTB-infected individuals (per person per year) s = Sputum smear-positive TB (no subscript implies all forms) a = Adult (15-49 Years Old)
8. $I_a^* = I_a^+ - I_a^- N_a^+ / N_a^-$	n = Other age groups (<15 or >49 Years Old), assumed HIV-uninfected
9. $D_a^* = D_a^+ - f^- (I^+ - I_a^*)$	+ = HIV positive - = HIV negative * = Attributable to HIV infection

Annex 3

Statistical Methods

Rates of change per year in time series were assessed by estimating the slope of the log-transformed rates against time.

The statistical analysis was carried out using the R language²², freely downloadable from the internet²³.

²² Ross Ihaka and Robert Gentleman. R: A language for data analysis and graphics. *Journal of Computational and Graphical Statistics*, 5(3):299-314, 1996.

²³ <http://www.r-project.org>



World Health Organization
South-East Asia Region Western Pacific Region