

Targets for tuberculosis control: how confident can we be about the data?

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Abstract The targets of tuberculosis (TB) control programmes are to detect 70% of new sputum smear-positive cases of TB and to cure 85% of these. The Stop TB Partnership has set additional targets related to the Millennium Development Goals: to halve TB prevalence and mortality between 1990 and 2015. This paper assesses how confident we can be about the data on TB case detection, cure rates, prevalence and mortality. Countries were grouped into those with good, limited or poor information on the burden of TB (based on notification data, population surveys and vital registration systems). Of 211 countries with a total population of 6.4 billion and an estimated 8.9 million cases of TB, 27 countries with a total population of 2.2 billion and an estimated 1.8 million cases of TB had estimates based on good information (i.e. a good-quality surveillance system detecting > 70% of all cases, or a good-quality TB prevalence survey). Of the 22 countries with a high burden of TB and bearing 80% of the global burden, none had a good surveillance system in 1997. Vital registration systems were good in 81 countries with a total population of 2.7 billion. This paper suggests that globally and in the 22 countries with a high burden of TB there is considerable uncertainty about indicators to measure progress towards the Millennium Development Goals. Routine surveillance and vital registration systems need to be strengthened. We recommend that national TB prevalence surveys be performed in selected high-burden countries, in Africa in particular.

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Une traduction en français de ce résumé figure à la fin de l'article. Al final del artículo se facilita una traducción al español. الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.

Introduction

Tuberculosis (TB) is an important cause of illness and death globally, accounting for an estimated 8.8 million new cases and 1.6 million deaths each year.¹ *Mycobacterium tuberculosis*, the organism that causes TB, is found almost exclusively in humans, and is spread by patients with pulmonary tuberculosis, in particular those with sputum smears in which *M. tuberculosis* has been identified. The most important control strategy is the early identification and treatment of infectious cases of TB. It has been suggested that if 70% of new smear-positive cases were detected and 85% of these were cured, a substantial impact on the prevalence of TB, and thus on its transmission and future incidence, would be expected.²⁻⁴

Rates of case detection and cure, as well as prevalence and mortality, have been included as indicators for measuring progress towards achieving the Millennium Development Goals.⁵ It was expected that the targets of the Stop TB Partnership, i.e. to halve the prevalence and mortality of TB between 1990 and

2015, would be possible if the targets for case detection and cure were reached by 2005, based on the model described by Dye et al.³ This model fitted fairly well with data from the Netherlands. However, whether important parameters such as risk of disease after infection (which may depend on factors such as the immune status of the host, nutritional status and smoking) can be extrapolated from the Netherlands to other settings is uncertain. Consequently, we do not know whether achieving the targets of case detection and cure will have the expected impact on TB incidence.

Whether or not countries are achieving the targets for case detection and cure is often uncertain. The case detection rate, which has notifications in the numerator and estimated TB incidence in the denominator, is difficult to estimate. The reported cure rate is generally based on routine surveillance data, but may require validation because the success of TB control programmes may be overestimated by their managers at national or lower levels. Estimates of TB incidence, prevalence and mortality by country are made annually by the

World Health Organization, making the best use of information available.⁶ However, WHO acknowledges that the accuracy of these estimates is uncertain because assumptions are required to obtain the estimates from the available data and the data themselves contain uncertainty.⁷

The aim of this paper is to describe how confident we can be about the available data on TB case detection, cure rates, prevalence and mortality. It gives special attention to the 22 countries with a heavy burden of TB and in which approximately 80% of the global burden of TB is found.

Methods

Case detection rates

WHO's estimates of case detection rate by country are reported annually for new smear-positive cases and for all forms of TB. Since the Stop TB strategy⁸ emphasizes the detection and treatment of all forms of TB, we focus on the case detection rate of all forms of TB in this analysis. To assess the quality of these estimates, we used the initial publication

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of the global burden of tuberculosis, which is the foundation for the current WHO estimates.⁶ Countries were divided into three groups according to the basis for these estimates: expert opinion, tuberculin survey(s) and TB prevalence surveys.

Since the initial publication,¹ re-estimates of the prevalence and incidence of TB have been made for 39 countries. We received information about the method of re-estimation and the background documents from the WHO Stop TB Department. Information used for the re-estimation consisted of expert knowledge, recently performed tuberculin or TB prevalence surveys, or vital registration data. For these 39 countries, we used this updated information to assess data quality.

Two epidemiologists assessed the TB prevalence surveys in publications used by Dye et al.⁶ for estimating TB prevalence and incidence, and the surveys used for the re-estimates; the surveys were categorized as eligible or not eligible for estimation of the national prevalence of TB. A survey was considered to be eligible if: it was conducted not more than 15 years before the year of estimation; probability sampling was used, leading to a nationally representative sample; sputum examination was performed either for all cases or for those with chest X-ray abnormalities; and cases were bacteriologically confirmed. If the available information was inadequate to judge eligibility, eligibility was recorded as unknown.

Next, countries were categorized into three groups. The first group was countries for which good information on the burden of TB was available, in the form of a good national TB prevalence survey or a good surveillance system, as judged by expert opinion,⁶ and capturing at least 70% of cases with all forms of TB.¹ The second group comprised countries for which limited information on the burden of TB was available; this included countries with a TB prevalence survey classified as not eligible, with data from a tuberculin survey or vital registration systems available or surveillance systems considered to be good, but capturing less than 70% of cases with all forms of TB. The third group included countries for which information on the burden of TB was poor, the surveillance system was not considered to be good by experts⁶ and no additional information from population surveys or vital registration systems was available.

Cure rates

Cure rates tend to be accepted as reported by TB control programmes. We conducted a literature search in PubMed using the search terms “tuberculosis” and “cure rate” to identify articles that assessed the quality of reported cure rates.

Rates of mortality from TB

A recent review of death registration systems worldwide⁹ was used to classify countries into three groups with respect to completeness of cause-of-death registration: (1) good – cause of death registration completeness > 70% and ill-defined codes < 20%; (2) limited – cause of death registration completeness 50–70%; or completeness > 70% and ≤ 20% ill-defined codes; and (3) poor – death registration completeness < 50%, or no information submitted to WHO by December 2003.⁹ Completeness refers to the percentage of deaths registered; ill-defined causes of death are specified by ICD code in the original reference.⁹ If information about completeness was not available, estimated coverage (total number of deaths reported from the vital registration system for a country in a given year divided by the total number of deaths estimated by WHO for that year for the national population) was used.

Annual reported data on mortality statistics by cause of death (ICD-9 and ICD-10) as obtained from civil registration systems were downloaded from the WHO web site.¹⁰ Using this database, we calculated the number of deaths attributable to tuberculosis per country per year. The total number of deaths from TB in 2004 or the most recent reported year was compared with the estimated number of deaths from TB in 2004 as reported in the WHO 2006 report¹ for countries with a good death registration system.

Results

Case detection rates and estimates of TB prevalence

For 13 countries, the results of a TB prevalence survey were used to estimate the incidence and prevalence of TB in 2004. For Macau, a Special Administrative Region of China, and Mongolia, the results of the TB prevalence survey in China¹¹ were used; and for Palau the results of the survey in the Philippines

were used.¹² Of the ten surveys, the four performed in the WHO Western Pacific Region were assessed as eligible for estimation of the national prevalence of TB (Table 1). The survey in the WHO Eastern Mediterranean Region and the surveys in the WHO South-East Asia Region were considered to be not eligible, or information provided in the document that described the survey was inadequate to judge eligibility.

Of 211 countries with a total population of 6.4 billion and an estimated 8.9 million cases of all forms of TB, 27 countries with a total population of 2.2 billion and an estimated 1.8 million cases of all forms of TB had TB estimates that were based on good information (Table 2). Of these 27 countries with good information, a TB prevalence survey of good quality had been conducted in 4 countries with a population of 1.5 billion and an estimated 1.7 million cases of all forms of TB. In 154 countries with a total population of 2.0 billion and an estimated 3.1 million cases of all forms of TB, TB estimates were based on poor information, i.e. a surveillance system not considered to be good and without additional information from population surveys or vital registration systems (Table 2). The proportion of the population for which information on TB was of poor quality was largest in Africa and Europe.

Of the 22 countries with a high burden of TB, with a total population of 4.0 billion and an estimated 7.1 million cases of all forms of TB, none had a surveillance system considered to be good in 1997. The case detection rate for all forms of TB was estimated to be more than 70% in four countries (Brazil, Myanmar, the Russian Federation and South Africa). Overall, three countries with a high burden of TB (Cambodia, China and the Philippines), with a total population of 1.4 billion and an estimated 1.6 million cases of all forms of TB, had TB estimates based on good information (Table 3, available at: <http://www.who.int/bulletin>). In these three countries, this was based on a TB prevalence survey.

Cure rates

We did not identify any formal evaluations of cure rates. Therefore, this review was unable to evaluate the quality of data on cure rates.

Table 1. Assessment of the quality of surveys used to estimate the prevalence and incidence of all forms of tuberculosis in the WHO 2006 report¹

| WHO region/ country | Information used for quality assessment | | | | Overall result of quality assessment ^a | Reference |
|--------------------------------|--|---|---|--|--|-----------|
| | Survey conducted ≤ 15 years before the year of estimation (year of survey) | Probability sampling used, leading to a nationally representative sample | Sputum examination performed either in all cases, or in those with radiological abnormalities | Cases bacterio- logically confirmed | | |
| Eastern Mediterranean | | | | | | |
| Pakistan | Yes (1987–1988) | ? | No | Yes | Not eligible | 22 |
| South-East Asia | | | | | | |
| Bangladesh | Yes (1987–1988) | Yes | No | Yes | Not eligible | 23 |
| Indonesia | Yes (2004) | Yes | No | Yes | Not eligible | 24 |
| Nepal | No (1978) | ? | No | Yes | Not eligible | 25 |
| Thailand | Yes (1991) | ? | ? | ? | Unknown | 26 |
| Western Pacific | | | | | | |
| Brunei Darussalam ^b | – | – | – | – | Unknown | |
| Cambodia | Yes (2002) | Yes | Yes | Yes | Eligible | 17 |
| China | Yes (2000) | Yes | Yes | Yes | Eligible | 11 |
| Philippines | Yes (1997) | Yes | Yes | Yes | Eligible | 12 |
| Republic of Korea | Yes (1995) | Yes | Yes | Yes | Eligible | 16 |

?, information not provided in the background document.

^a The survey was considered eligible if: (a) the survey was conducted no more than 15 years before the year of estimation; (b) probability sampling was used leading to a nationally representative sample; (c) sputum examination was performed either in all cases or in those with chest X-ray abnormalities; and (d) cases were bacteriologically confirmed. If information was inadequate to judge eligibility, eligibility was recorded as “unknown”.

^b Background document not available.

Estimates of mortality attributable to TB

Vital registration systems were considered to be good in 81 countries with a total population of 2.7 billion (Table 4). Most of the population of the WHO European and South-East Asia Regions and the Region of the Americas was covered by good vital registration systems. However, this proportion was low (< 20%) in the African, Eastern Mediterranean and Western Pacific Regions (Table 4). Of the 22 countries with a high burden of TB, only three (India, Philippines and the Russian Federation) with a total population of 1.3 billion were considered to have good vital registration systems.

Seventy-seven of the 81 countries with a good vital registration system reported data on mortality statistics using ICD-9 or ICD-10 to WHO. Mortality statistics were not available from the Cook Islands, India, Oman and Tonga. The estimated mortality corresponds well with the reported data ($R = 0.89$; Fig. 1).

Discussion

This paper has shown that globally, and in the 22 countries with a high burden

of TB, there is uncertainty about the disease's incidence, prevalence, mortality, case detection rates and perhaps cure rates. While WHO makes the best use of the available information, more data are needed to reduce the uncertainty in these estimates. A large proportion of the global population is not covered by high-quality surveillance systems that capture more than 70% of TB cases. Independent confirmation of cure rates is not usually obtained. National TB prevalence surveys of sufficient quality have only been conducted in a few countries. And finally, vital registration systems have poor coverage in parts of the world with a high burden of TB, including the WHO African, Eastern Mediterranean and Western Pacific Regions. The problem of uncertainty is largest in Africa: Africa has the world's highest burden of TB and experiences the most serious impact from the HIV epidemic; however, independent information on the burden of TB is limited and vital registration systems are poor. Therefore the need for TB prevalence surveys is of highest priority in Africa.

The quality of a notification system has two important aspects: consistency

and completeness. Consistency can be, and is, checked fairly easily. Indicators include the proportion of years and subunits (e.g. districts or provinces) for which data are available, and year-to-year variation. However, the completeness or coverage of case detection remains uncertain in the absence of data sources independent from TB notifications. Such independent data sources may include laboratory and hospital discharge information to be used for capture–recapture analysis,^{13–15} or, where appropriate, population surveys.^{11,12,16,17} It would be particularly helpful to assess case detection from independent data sources in two instances: high-burden countries with inadequate surveillance systems, and countries that are thought to have a case detection rate of 70% or more, to certify that that target has indeed been met. In countries with inadequate surveillance systems, such assessments may need to be repeated every ten years or so, until it is shown that trends in notification rates provide reliable estimates of trends in incidence in the country concerned.

Prevalence surveys provide essential information on the burden of TB

Table 2. Estimated incidence of all forms of tuberculosis according to quality of information, by WHO region

| WHO region | Quality of information ^a | No. of countries | Population in 2004 (millions) | Incidence | |
|-----------------------|-------------------------------------|------------------|-------------------------------|-----------------------|-----------------------------|
| | | | | No. of cases (× 1000) | Rate per 100 000 population |
| African | Good | 0 | 0 | 0 | 0 |
| | Limited | 2 | 80 | 357 | 448 |
| | Poor | 44 | 642 | 2 216 | 345 |
| Americas | Good | 5 | 358 | 20 | 6 |
| | Limited | 4 | 165 | 97 | 59 |
| | Poor | 35 | 357 | 246 | 69 |
| Eastern Mediterranean | Good | 1 | 31 | 34 | 110 |
| | Limited | 8 | 279 | 516 | 185 |
| | Poor | 13 | 220 | 95 | 43 |
| European | Good | 13 | 171 | 28 | 16 |
| | Limited | 6 | 67 | 9 | 13 |
| | Poor | 33 | 643 | 408 | 63 |
| South-East Asia | Good | 1 | 0.3 | 0.2 | 49 |
| | Limited | 7 | 1 589 | 2 910 | 183 |
| | Poor | 3 | 44 | 57 | 130 |
| Western Pacific | Good | 7 | 1 603 | 1 717 | 107 |
| | Limited | 3 | 89 | 156 | 175 |
| | Poor | 26 | 48 | 53 | 110 |
| Global | Good | 27 | 2 163 | 1 799 | 83 |
| | Limited | 30 | 2 269 | 4 044 | 178 |
| | Poor | 154 | 1 955 | 3 075 | 157 |
| | Total | 211 | 6 387 | 8 918 | 140 |

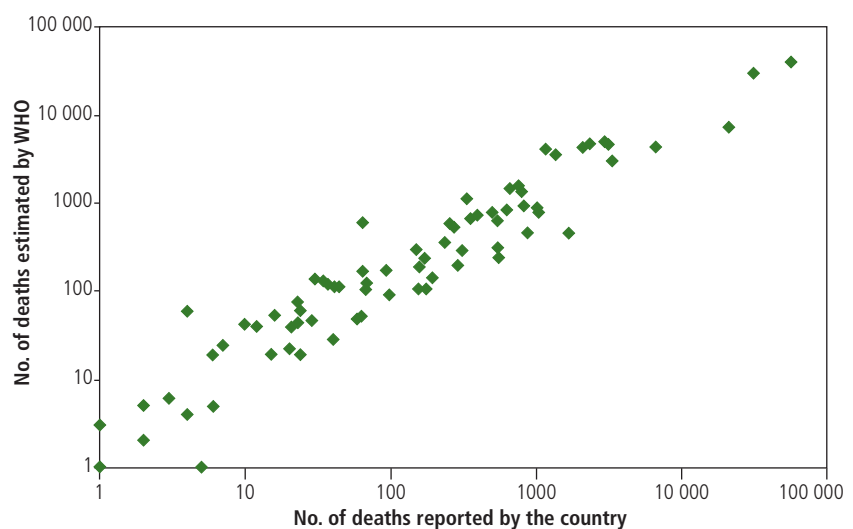
^a Good = good national TB prevalence of disease survey or a good surveillance system according to expert opinion⁶ and capturing at least 70% of all cases – as in most industrialized countries¹; Limited = neither good nor poor information; Poor = surveillance system not considered good by experts⁶ and no additional information available from population surveys or vital registration systems.

when the data provided by surveillance systems are of insufficient consistency or completeness. In this review, a large proportion of identified surveys could not be used to derive national estimates owing to limitations in sampling or data collection. This suggests the need to establish standard guidelines, and, where appropriate, to have access to technical assistance. The WHO Regional Office for the Western Pacific and partners are now preparing guidelines for the planning, conduct and analysis of TB prevalence surveys in order to increase their utility and comparability.

Repeated surveys of the prevalence of TB disease or infection can provide valuable trend estimates if rigorous methods are used that have a constant sensitivity (e.g. chest-X-ray for identification of suspects). We showed that few countries had performed at least one survey on the prevalence of disease or infection that was of sufficient quality. This suggests that surveys should

Fig. 1. Comparison of number of deaths from tuberculosis estimated by WHO and number of deaths from tuberculosis reported by countries with a good death registration system

Regression line is $2.5 + 7.9x$, $R = 0.89$



Sources: WHO estimates of mortality from tuberculosis were obtained from the WHO 2006 Report.¹ The numbers of deaths from tuberculosis reported by country were obtained from the WHO database.¹⁰ Analysis and interpretations were performed by the authors.

Table 4. Quality of death registration systems covering countries and population in 2004, by WHO region

| WHO region | Quality of death registration system ^a | | | Total |
|----------------------------------|---|--------------|------------|-------------|
| | Good | Intermediate | Poor | |
| African | | | | |
| Number of countries (%) | 2 (4) | 2 (4) | 42 (91) | 46 (100) |
| Population 2004, in millions (%) | 1 (0.2) | 80 (11) | 641 (89) | 722 (100) |
| Americas | | | | |
| Number of countries | 24 (55) | 7 (16) | 13 (30) | 44 (100) |
| Population 2004, in millions (%) | 567 (64) | 275 (31) | 38 (4) | 880 (100) |
| Eastern Mediterranean | | | | |
| Number of countries | 2 (9) | 7 (32) | 13 (59) | 22 (100) |
| Population 2004, in millions (%) | 5 (1) | 177 (33) | 348 (66) | 530 (100) |
| European | | | | |
| Number of countries | 41 (79) | 9 (17) | 2 (4) | 52 (100) |
| Population 2004, in millions (%) | 735 (83) | 146 (17) | 0.1 (0.0) | 881 (100) |
| South-East Asia | | | | |
| Number of countries | 1 (9) | 3 (27) | 7 (64) | 11 (100) |
| Population 2004, in millions (%) | 1 087 (67) | 85 (5) | 461 (28) | 1 633 (100) |
| Western Pacific | | | | |
| Number of countries | 11 (31) | 8 (22) | 17 (47) | 36 (100) |
| Population 2004, in millions (%) | 313 (18) | 1 309 (75) | 117 (7) | 1 740 (100) |
| Global | | | | |
| Number of countries | 81 (38) | 36 (17) | 94 (40) | 211 (100) |
| Population 2004, in millions (%) | 2 710 (42) | 2 071 (32) | 1 606 (25) | 6 387 (100) |

Source: Mathers et al.⁹

^a Good = cause of death registration completeness > 70% and ill-defined codes < 20%; Intermediate = cause of death registration completeness 50–70%; or completeness > 70% and ≥ 20% ill-defined codes; Poor = death registration completeness < 50% or no information submitted to WHO by December 2003.

be performed urgently, in particular in Africa, and be repeated by 2015 to assess progress towards achieving the Millennium Development Goals and Stop TB Partnership targets.

While well-conducted surveys of disease prevalence can be used to estimate national prevalence, estimating incidence requires additional assumptions and involves uncertainties. For this reason, it has been argued that detection rate may be a more appropriate indicator than the proportion of patients detected.¹⁸

We used data about the quality of notification systems as judged by expert opinion in 1997.⁶ Since notification systems have probably improved since this time, we attempted to update the quality assessment of the notification systems by defining uniform criteria that can be used to judge the quality of surveillance systems using the information available in the annual country reports. It appeared that this was not possible. Thus a new round of expert consultation (as was done in 1997)⁶ or collection of information that can be used to assess the quality of the notification system would

be required to re-assess the quality of the surveillance system.

No formal evaluations of the cure rate were identified. Informal assessments are often part of technical assistance visits and programme reviews. We believe certification that the cure rate is 85% or more in countries claiming this success would be extremely informative, since managers of TB control programmes may be tempted to overestimate treatment success. A standard protocol would need to be developed for this certification.

Data on TB mortality would in principle be best obtained from routine vital registration systems. Unfortunately, these systems are least developed in the countries with the highest TB rates, so further development of vital registration systems is clearly the way forward. In some countries, sample vital registrations may be set up in representative areas of the country as an intermediate step. In the short term in many countries, mortality attributable to TB may need to be estimated with the use of simple models. Such models require information on the burden of TB and

the rate of case detection or proportion of cases detected. As suggested above, the latter information may be obtained at least in part from prevalence surveys in high-burden countries.

The impact of HIV on TB estimates is important and has been taken into account by Corbett et al., who used parameter estimates from literature review and HIV estimates provided by the Joint United Nations Programme on HIV/AIDS (UNAIDS).¹⁹ These methods are included in the annual WHO TB burden estimates. The estimates of TB in countries with a high burden of HIV are less certain than those in other countries, since there is additional uncertainty about the HIV estimates and about the exact impact of HIV on TB incidence, mortality and case detection. HIV has had the biggest impact in Africa, reinforcing the conclusion that uncertainty about the burden of TB is greatest in Africa.

One of the parameters used to estimate the incidence of TB in the presence of HIV is the relative risk of developing TB in HIV-infected individuals who are co-infected with *M. tuberculosis*. In the

global estimates it is assumed that HIV-infected individuals are six times more likely to develop TB than are individuals who are not infected with HIV.¹⁹ While this is a reasonable overall assumption, it is also clear that the rate ratio varies between settings and depends on the stage of the HIV epidemic, and that the impact of HIV depends on the degree of clustering of TB and HIV in specific risk groups. Further information on this is likely to become available in the near

future with the uptake of diagnostic counselling and testing in Africa,^{20,21} and from TB prevalence surveys in which TB patients and a sample of controls are offered testing for HIV.

We conclude that routine surveillance and vital registration systems need strengthening in most countries with a high burden of TB in order to assess progress towards the Millennium Development Goals. In the short term, we recommend the wider use of national

TB prevalence surveys to provide information on the burden of TB, especially in Africa. ■

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Résumé

Objectifs de la lutte antituberculeuse : quelle confiance pouvons-nous accorder aux données ?

Les programmes nationaux de lutte antituberculeuse ont pour objectifs de détecter 70 % des nouveaux cas de tuberculose (TB) à frottis positif et de guérir 80 % des cas détectés. Dans le cadre de la réalisation des objectifs du Millénaire pour le développement, le Partenariat Halte à la tuberculose a défini un objectif supplémentaire : diviser par deux, entre 1990 et 2015, la prévalence de la tuberculose et la mortalité due à cette maladie. Le présent article évalue le degré de fiabilité des données concernant la détection des cas de TB, les taux de guérison, la prévalence de la TB et la mortalité due à cette maladie. Les pays ont été répartis en trois catégories selon que l'on disposait de données satisfaisantes, limitées ou insatisfaisantes sur la charge de TB qu'ils supportent (d'après les données de notification, les enquêtes en population et les systèmes d'enregistrement des données d'état-civil). Parmi 211 pays représentant une population totale de 6,4 milliard d'habitants et un nombre total de cas de TB estimé à 8,9 millions, 27 (regroupant au total 2,2 milliard d'habitants et un nombre de

cas de TB estimé à 1,8 million) disposaient d'estimations reposant sur des données satisfaisantes (c'est-à-dire fournies par un bon système de surveillance, détectant plus de 70 % des cas, ou par une enquête sur la prévalence de la TB de bonne qualité). Parmi les 22 pays supportant une forte charge de TB et totalisant à eux seuls 80 % de la charge mondiale de tuberculose, aucun ne pouvait compter en 1997 sur un bon système de surveillance. Les systèmes d'enregistrement des données d'état-civil étaient satisfaisants dans 81 pays regroupant au total 2,7 milliards d'habitants. L'article fait observer qu'à l'échelle mondiale et dans les 22 pays fortement touchés par la TB, les indicateurs servant à mesurer les progrès dans la réalisation des objectifs du Millénaire pour le développement sont entachés d'une grande incertitude. La surveillance de routine et les systèmes d'enregistrement des données d'état-civil doivent être renforcés. Nous recommandons de procéder à des enquêtes sur la prévalence nationale de la TB dans un certain nombre de pays fortement touchés par la tuberculose, notamment en Afrique.

Resumen

Metas de control de la tuberculosis: ¿qué fiabilidad tienen los datos?

Las metas de los programas de control de la tuberculosis consisten en detectar un 70% de los nuevos casos bacilíferos y curar el 85% de esos casos. La Alianza Alto a la Tuberculosis ha establecido nuevas metas relacionadas con los Objetivos de Desarrollo del Milenio: reducir a la mitad la prevalencia de tuberculosis y la mortalidad por esa causa entre 1990 y 2015. En este artículo se evalúa la fiabilidad de los datos sobre la detección de casos de tuberculosis y las tasas de curación, la prevalencia y la mortalidad correspondientes. Se clasificó a los países en función de la calidad de su información -buena, escasa o mala- sobre la carga de tuberculosis (calibrada a partir de los datos de notificación, las encuestas de población y los sistemas de registro civil). De 211 países con una población total de 6400 millones de personas y una cifra estimada de 8,9 millones de casos de tuberculosis, 27 países con una población total de 2200 millones de habitantes y unos 1,8 millones de casos estimados disponían de estimaciones basadas en una buena

información (es decir, un sistema de vigilancia de buena calidad que detectaba más del 70% de todos los casos, o una encuesta de buena calidad sobre la prevalencia de la tuberculosis). De los 22 países con una alta carga de tuberculosis, que suponen el 80% de la carga mundial, ninguno tenía un buen sistema de vigilancia en 1997. Los sistemas de registro civil eran satisfactorios en 81 países que totalizaban una población de 2700 millones de personas. En el presente artículo se sugiere que tanto a nivel mundial como en los 22 países que presentan una alta carga de tuberculosis existe una incertidumbre considerable sobre los indicadores empleados para medir los progresos hacia los Objetivos de Desarrollo del Milenio. Es preciso reforzar la vigilancia sistemática y los sistemas de registro civil. Recomendamos que se lleven a cabo encuestas nacionales sobre la prevalencia de la tuberculosis en algunos de los países con alta carga de la enfermedad, en África en particular.

ملخص

أهداف مكافحة السل: إلى أي مدى يمكن لنا الوثوق بالمعطيات؟

جيدة في 27 بلداً يعيش فيها 2.2 مليون نسمة وفيها 1.8 مليون حالة سل، وذلك يعني أن لديها نظام ترصد عالي الجودة يكشف أكثر من 70 بالمائة من مجمل الحالات، أو أن لديها مسوحات عالية الجودة لانتشار السل. ولم يكن بين 22 بلداً من البلدان التي تتحمل عبئاً مرتفعاً للسل يبلغ 80 بالمائة من العبء العالمي، لم يكن بينها أي بلد لديه نظام ترصد جيد في عام 1997. وقد كانت نُظُم تسجيل الأحوال المدنية جيدة في 81 بلداً يعيش فيها 2.7 بليون نسمة. وتقتصر هذه الورقة أن هناك ارتباطاً حول المؤشرات التي تقيس التقدم المحرز نحو المرامي الإنمائية للألفية في 22 بلداً من البلدان التي ترحح تحت عبء ثقيل من السل. وينبغي تقوية النظم الروتينية لتسجيل الأحوال المدنية وللترصّد. ونوصي بإجراء مسوحات وطنية لمعدلات انتشار السل في بلدان منتقاة تنوع تحت عبء ثقيل من السل ولاسيما في أفريقيا.

تتمثل أهداف برامج مكافحة السل بكشف 70 بالمائة من الحالات الإيجابية للاختبارات البلغم وشفاء 85% منها. وقد وضعت شراكة دحر السل أهدافاً أخرى متعلقة بالمرامي الإنمائية للألفية وهي: الوصول بمعدلات انتشار ووفيات السل إلى نصف ما كانت عليه عام 1990، وذلك بحلول عام 2015. وتقيّم هذه الورقة المدى الذي يمكن لنا الوثوق به بالمعطيات الخاصة بكشف السل؛ وبمعدلات الشفاء، والانتشار والوفيات. وقد قُسمت البلدان إلى مجموعات هي مجموعة ذات معلومة جيدة، ومجموعة ذات معلومات محدودة، ومجموعة ذات معلومات سيئة؛ وذلك وفقاً لما لديها من معلومات حول عبء السل (ويرتكز التقسيم على الإبلاغ بالمعطيات، والمسوحات السكانية ونظم التسجيل للأحوال المدنية) ومن بين 211 بلداً يعيش فيها 6.4 بليون نسمة، وفيها 8.9 مليون حالة سل، كان هناك تقديرات مرتكزة على معطيات

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Table 3. Information available on tuberculosis in 22 countries with a high burden of disease

| Country | Available information | | | | | Overall quality of available information ^f | Population in 2004 (millions) | Incidence of TB in 2004 | |
|----------------------------------|---|---|---|--------------------------------|--|---|-------------------------------|-------------------------|-----------------------------|
| | Quality of surveillance system in 1997 ^a | % of all TB patients captured by surveillance system ^b | Assessment of TB prevalence survey ^c | Tuberculin survey ^d | Quality of vital registration ^e | | | No of cases (× 1000) | Rate per 100 000 population |
| Afghanistan | Low | 19 | – | Yes | Poor | Limited | 29 | 95 | 333 |
| Bangladesh | Low | 31 | Not eligible | – | Poor | Limited | 139 | 319 | 229 |
| Brazil | Intermediate | 79 | – | – | Intermediate | Poor | 184 | 110 | 60 |
| Cambodia | Intermediate | 44 | Eligible | – | Poor | Good | 14 | 70 | 510 |
| China | Intermediate | 60 | Eligible | – | Intermediate | Good | 1 308 | 1 325 | 101 |
| Democratic Republic of the Congo | Low | 46 | – | – | Poor | Poor | 56 | 204 | 366 |
| Ethiopia | Low | 46 | – | – | Poor | Poor | 76 | 267 | 353 |
| India | Intermediate | 62 | – | Yes | Good | Limited | 1 087 | 1 824 | 168 |
| Indonesia | Low | 39 | Not eligible | – | Poor | Limited | 220 | 539 | 245 |
| Kenya | Low | 49 | – | – | Poor | Poor | 33 | 207 | 619 |
| Mozambique | Low | 35 | – | – | Poor | Poor | 19 | 89 | 460 |
| Myanmar | Low | 113 | – | Yes | Poor | Limited | 50 | 85 | 171 |
| Nigeria | Low | 15 | – | – | Poor | Poor | 129 | 374 | 290 |
| Pakistan | Low | 36 | Unknown | – | Poor | Limited | 155 | 281 | 181 |
| Philippines | Intermediate | 55 | Eligible | – | Good | Good | 82 | 239 | 293 |
| Russian Federation | Intermediate | 73 | – | – | Good | Poor | 144 | 166 | 115 |
| South Africa | Low | 78 | – | – | Intermediate | Limited | 47 | 339 | 718 |
| Thailand | Intermediate | 61 | Unknown | – | Intermediate | Limited | 64 | 91 | 142 |
| Uganda | Low | 39 | – | – | Poor | Poor | 28 | 112 | 402 |
| United Republic of Tanzania | Intermediate | 48 | – | – | Poor | Poor | 38 | 131 | 347 |
| Viet Nam | Intermediate | 67 | – | Yes | Poor | Limited | 83 | 147 | 176 |
| Zimbabwe | Intermediate | 64 | – | – | Poor | Poor | 13 | 87 | 674 |
| Total | | | | | | | 3 993 | 7 102 | 178 |

TB, tuberculosis; –, no data on prevalence of disease or infection used for estimating TB incidence and prevalence.

^a According to expert opinion.⁶

^b Case detection rate of 2004 for all forms of TB.¹

^c A prevalence of disease survey was considered eligible if: (1) the survey was conducted no more than 15 years before the year of estimation; (2) probability sampling was used leading to a nationally representative sample; (3) sputum examination was performed either in all cases or in cases with chest X-ray abnormalities; and (4) cases were bacteriologically confirmed. If information was inadequate to judge eligibility, eligibility was recorded as "unknown".

^d Information from tuberculin surveys was used by Dye et al.⁶ to estimate incidence and prevalence of TB. The tuberculin surveys in India were performed between 2000 and 2003. In Viet Nam, they were performed between 1988 and 1990. For Afghanistan, the reference document was not available. For Myanmar, the reference document did not state the year of the survey.

^e Based on a recent review of death registration systems worldwide by Mathers et al.¹¹: Good = cause of death registration completeness > 70% and ill-defined codes < 20%; Intermediate = cause of death registration completeness 50–70%, or completeness > 70% and ≥ 20% ill-defined codes; Poor = death registration completeness < 50% or no information submitted to WHO by December 2003.

^f Good = good national TB prevalence-of-disease survey or a good surveillance system according to expert opinion⁶ and capturing at least 70% of all TB cases (as in most industrialized countries);¹ Limited = neither good nor poor information; Poor = surveillance system not considered good by experts⁶ and no additional information available from population surveys or vital registration systems.