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TUBERCULOSIS IN THE AMERICAS

Tuberculosis, a curable and preventable disease, remains a major public health threat in the Region, with an estimated 400,000 new cases each year. Without proper treatment each case is at risk of death. An estimated 3%-5% of all new cases in the Region are attributable to coinfection with the human immunodeficiency virus (HIV). Less than two-thirds of all new cases are reported, and most that go unreported will receive inadequate treatment or no treatment. To confront what the World Health Organization has declared a "global health emergency," the World Health Assembly adopted two targets for tuberculosis control for the year 2000 which will diminish morbidity, mortality, and transmission of the disease: cure of 85% of all detected pulmonary smear-positive (infectious) cases and detection of 70% of new smear-positive cases. The global strategy for control of the disease is through the provision of directly-observed treatment, short-course (DOTS) to at least all infectious patients. It is among the most cost-effective health interventions available and is included in the World Bank's proposed "essential package of health services" for application in primary health care. In this Region, there have been some important advances in control of the disease. Nevertheless, the majority of countries still must significantly improve the quality and coverage of their programs to control this reemergent disease.

This report provides a brief overview of the tuberculosis situation in the Region, and strengths and weaknesses in its control. The Directing Council is requested to consider how the global strategy for tuberculosis control may be applied most effectively in the Americas and how national programs may be strengthened.

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EXECUTIVE SUMMARY

Tuberculosis, a curable and preventable disease, remains a major public health threat in the Region, with an estimated 400,000 cases each year. Without proper treatment, each case is at risk of death. Some 60,000 to 75,000 persons die each year, with the majority in their most productive adult years. An estimated 3%-5% of all new cases in the Region are attributable to coinfection with the human immunodeficiency virus (HIV). Fewer than two-thirds of all new cases are reported, and most that go unreported will receive inadequate treatment or no treatment. As a result of poor treatment, some patients may go on to develop and spread drug-resistant tuberculosis strains.

To confront what the World Health Organization has declared a "global health emergency," the World Health Assembly has adopted two targets for tuberculosis control for the year 2000 which will diminish morbidity, mortality, and transmission of the disease: cure of 85% of all detected pulmonary smear-positive (infectious) cases and detection of 70% of new smear-positive cases.

The global strategy for control of the disease is based on the provision of directly-observed treatment, short-course (DOTS). It is among the most cost-effective health interventions available and is included in the World Bank's proposed "essential package of health services." The five elements of the global control strategy are: government commitment to a tuberculosis program; case detection through predominantly passive case-finding; standardized and directly-observed short-course chemotherapy for all pulmonary smear-positive cases; regular drug supply; and a program monitoring and evaluation system.

Applying the framework above, some countries detect more than 70% of new smear-positive cases, and a few have surpassed the cure rate target. However, too few countries are achieving such results.

The majority of countries still must significantly improve the quality and coverage of their programs to control this reemergent disease in order to reach the year 2000 control targets. The seriousness of the tuberculosis situation must be recognized and resources must be dedicated to the essential functions of control programs. It has proven highly effective and efficient to ensure full application of the control strategy, first in demonstration areas and then gradually expanded to national coverage.

PAHO/WHO, Ministries of Health, nongovernmental organizations, and bilateral and multilateral agencies must all collaborate in building and/or revitalizing sustainable control programs based on the DOTS strategy to ensure rapid progress in tuberculosis case detection and effective treatment.

1. Introduction: Targets for the Control of a Global Public Health Threat

Tuberculosis is a lethal infectious disease caused by the air-borne transmission of the *Mycobacterium tuberculosis* (*M. tuberculosis*). No individual is free from the threat of infection. WHO estimates that one-third of the world's population has been infected by *M. tuberculosis*. Only one in ten immuno-competent persons will develop disease once infected but, having developed active disease, more than one-half of those ill will die within five years in the absence of treatment. While roughly 90% of cases involve principally pulmonary disease, tuberculosis can affect most other organs of the body. In addition, a person ill with active pulmonary disease is likely to infect 10 to 12 others in the course of one year.

Globally, more people are dying of tuberculosis today than at any other time in history. Approximately 30 million persons are expected to die this decade alone, with 8 million or more new cases expected each year. Tuberculosis is the greatest cause of preventable adult mortality from a single etiological agent, and causes more deaths than any other infectious agent. Deaths due to tuberculosis are believed to leave more children orphaned than any other infectious disease *(1)*. It also kills an estimated 170,000 children each year. Tuberculosis acts as an obstacle to women's development, as it is a greater killer of girls and women worldwide than all maternal causes *(2)*.

Tuberculosis is an even greater threat for immuno-compromised persons, such as those with HIV infection, or persons with chronic diseases such as diabetes. Studies suggest that persons co-infected with tuberculosis and HIV infection have a 5%-10% annual risk of developing active tuberculosis disease. It is already the major opportunistic infection that can be spread through the air, and it is the most frequent cause of death worldwide of HIV-infected individuals.

Inadequate and improper treatment for tuberculosis and unregulated access to anti-tuberculosis drugs have been shown in numerous countries to lead to the selection and spread of drug-resistant strains, which can make tuberculosis far more difficult and costly to treat and cure.

Because of rising case rates and increased understanding of the scope and severity of the tuberculosis epidemic, the World Health Organization took the unprecedented step in 1993 of declaring the disease a "global health emergency." It called on all nations to redouble efforts to achieve the global tuberculosis control targets for the year 2000 set by the World Health Assembly in 1991 (Resolution WHA44.8). In order to reduce tuberculosis morbidity, mortality, and transmission, two targets were set:

- cure of 85% of the pulmonary smear-positive cases detected;
- detection of 70% of new smear-positive (incident) cases.

In tuberculosis control, early case-finding and effective treatment is the best approach to disease prevention because sources of infection are eliminated and the chain of disease transmission is broken.[1] Foremost among the steps toward effective tuberculosis control is improved application of directly-observed therapy, short-course (DOTS). According to the World Bank, this strategy is among the most cost-effective of all health interventions available today.

2. The Tuberculosis Situation in the Americas

2.1 *Case Reporting*

WHO and PAHO received reports of 242,309 notified tuberculosis cases from 32 countries and six territories in the Region in 1994 *(3)*.[2] Cases notified in the Region represent approximately 7% of the global total of 3.3 million cases reported to WHO. Based on countries providing age- and sex-specific data, a majority of reported cases are among persons 25-54 years of age. Roughly 60% of notified cases are men and 40% are women.

From 1980 to 1994, the number of cases reported to PAHO/WHO has fluctuated generally between 230,000 and 250,000 (Figure 1). The absence of a clear trend at the regional level is likely due to various factors: incomplete program coverage, great variability in the completeness and accuracy of reports for a substantial proportion of countries, and a slowing in the decline in true incidence. Table 1 presents reported incidence rates for 1994 by country. It is suspected that close to a third of new cases in the Region are not reported, and some of these cases may never be diagnosed in the public or private sectors, leading to significant illness, death, and further transmission.

2.2 *Estimated Incidence, Mortality, and HIV-Associated Disease*

An estimated 60,000 to 75,000 persons died due to tuberculosis in the Region in 1995. Over 400,000 new cases occurred that year, with more than half of them in Brazil, Mexico, and Peru. Figure 2 provides a map with estimated incidence rates by country in Latin America and the Caribbean. (Note that the estimated rates are different from the reported rates given in Table 1.) Nine countries are estimated to confront severe tuberculosis incidence rates (85/100,000 or more). These are Bolivia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Paraguay, and Peru. Some of these countries and territories have reported and/or estimated rates on a par with the highest-rate countries in Africa and Asia.

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[1] BCG vaccination prevents severe, but generally non-infectious, forms of tuberculosis in children, but is not a significant weapon in preventing disease transmission.

[2] Barbados, Haiti, and six territories have not provided 1994 reports.

Argentina, Bahamas, Belize, Brazil, Chile, Colombia, French Guiana, Guyana, Mexico, Nicaragua, Panama, Suriname, and Venezuela are estimated to still face serious tuberculosis incidence rates of between 25-85/100,000. The following countries and territories have incidence rates estimated at under 25/100,000: Anguilla, Antigua and Barbuda, Barbados, Bermuda, British Virgin Islands, Canada, Cayman Islands, Costa Rica, Cuba, Dominica, Grenada, Guadaloupe, Jamaica, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos, United States of America, Uruguay, and U.S. Virgin Islands.

In a 1994 review of the HIV/AIDS and tuberculosis epidemics in Latin America and the Caribbean, PAHO experts estimated that more than 330,000 persons were dually infected with *M. tuberculosis* and the human immunodeficiency virus *(4)*. Based on current WHO estimates of country-specific HIV infection levels in the Region, *M. tuberculosis*. infection levels, and estimated probability of developing active disease, roughly 3%-5% of new cases occurring in the Region are now attributable to HIV co-infection. This is in keeping with results of available studies of HIV prevalence rates among tuberculosis patients in various countries in the Region *(5, 6)*.

In the city of Buenos Aires, Argentina, deaths attributable to tuberculosis rose by 76% from 1989 to 1992 (from 45 to 79 deaths), with the majority of deaths in young adults; from 1988 to 1992, the number of tuberculosis patients found to be HIV-positive increased from 4 to 177 (3% to 21% of all cases) *(7)*. In Brazil, WHO experts and their national counterparts participating in a national program review in 1994 predicted that, if current trends continue in each year of the coming decade, the HIV pandemic would account for "excess" cases equivalent to 10% of the tuberculosis case load *(8)*.

2.3 *Future Prospects*

Given past trends in countries with good reporting systems, it is expected that, in aggregate, tuberculosis case rates in the Region will likely continue to decline over the next decade, albeit at a much slower rate than was achieved during the previous two decades *(9)*. The number of cases reported will continue to increase, primarily due to population growth and the aging of the population. However, since the mid-1980s, a number of other important factors, in addition to the HIV pandemic and population growth, have been creating conditions conducive to disease reemergence in some countries of the Region. These include: (a) growth of marginalized populations; (b) neglect of public health infrastructure and neglect of tuberculosis control specifically; (c) existence of practices which can lead to spread of incurable drug-resistant strains, including widespread self-administered treatment; and (d) travel and migration. Therefore, in some countries case rates may increase. Further investigation of the

existence, nature, and causes of tuberculosis reemergence is needed. Nevertheless, improved application of the framework for tuberculosis control outlined below will help limit and/or eliminate the impact of these factors on tuberculosis control.

3. Tuberculosis Control Program Strengths and Weaknesses

The sections below comment on the strengths and weaknesses of tuberculosis control programs in five key areas,[3] and offer recommendations for priority interventions.

3.1 *Program Organization and Resources*

A majority of countries in the Region have long-established national tuberculosis control programs, often initiated as vertical programs 50 years ago when mass screening campaigns were initiated and hospital care was the norm. With the expansion of public health services in the 1970s and early 1980s and the adoption of ambulatory six- to twelve-month chemotherapy, specialized hospitals closed or were converted, and standardized diagnosis and treatment were adopted for application in primary health care services. Today, there are generally few program staff at central level, and very few programs have staff exclusively responsible for tuberculosis control at provincial or district levels. In the smaller nations of the Caribbean with low tuberculosis case rates, tuberculosis control programs per se do not exist. As a consequence, treatment norms and indicators of the effectiveness of control efforts often are not available.

Throughout the Region, ministries of health provide most of the resources provided for program operation, including drug supplies. The long history of tuberculosis control programs, however, may also represent a liability for programs. Some have seen inflation-adjusted budgets shrink in the last two decades, and competing public health priorities consume increased shares of public health resources. Many programs have limited capacity to mobilize new resources and too few staff to perform essential surveillance, training, and monitoring functions.

Among the developing countries that are near to or surpassing the year 2000 control targets are Chile, Cuba, and Uruguay, which have strong national control programs operating within high-coverage health systems and have dedicated sufficient resources for strong central units, enforcement of standardized norms, and increased targeting of efforts to serve high-risk populations as overall incidence falls.

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[3] These areas correspond to the five elements of WHO's global framework for tuberculosis control *(10)*.

More recently, Nicaragua and Peru have developed successful control programs based on the DOTS strategy. Nicaragua demonstrated the successful use of external resources to establish a sound and cost-effective control program *(11)* that is now sustained almost exclusively with national resources. Following a serious drug supply shortage in the late 1980s and a breakdown of control activities in Peru, strong program leadership and high-level political and community commitment made possible the full reorganization of the program *(12)*. Both countries have cure rates approaching the global year 2000 control target and have surpassed the case finding target *(13, 14)*.

At least 13 countries have recently revised their program norms. The challenge now in most countries is to ensure that revised norms are properly and fully implemented at all levels of the health system. It has proven highly effective and efficient first to ensure full application of the control strategy and to achieve the cure and case-detection targets in demonstration areas, and then to gradually expand to national coverage. Even with limited funds, the selected areas (often representing 10%-25% of the population) can be carefully monitored, demonstrate the appropriateness of the straightforward tools and the overall effectiveness of the strategy, and serve as a training ground for staff from the rest of the country. Because this approach generally relies on application at the district/municipal level, it also functions to strengthen local capacity compatible with decentralization objectives.

With PAHO technical cooperation, Bolivia, Brazil, Ecuador, Guatemala, and Mexico are now implementing DOTS demonstration areas, addressing case detection and laboratory capacity, treatment, drug supply, and program monitoring and evaluation, and have plans for their gradual national expansion. In the United States of America, control programs in cities experiencing a serious resurgence of case rates in the late 1980s, such as New York City, successfully pursued a DOTS strategy with the same basic elements.

3.2 *Case Detection and Laboratory Capacity*

Tuberculosis case detection and diagnosis depends on the identification of persons with symptoms (principally, cough and expectoration for more than three weeks) and their examination using low-cost tools. Due to great expansion of health service infrastructure in the 1970s, most countries benefit from reasonable access to services for medical examination and laboratories with smear microscopy. Most infectious tuberculosis cases can be detected by this means.

It is discouraging, however, that many countries still obtain, on average, roughly one sputum smear exam for diagnosis, rather than the recommended three, thereby failing to detect 25% or more of the infectious cases presenting for diagnosis. Patients are also missed due to failure of staff to even request exams. Many of the patients missed may reappear much later when their illness is quite severe. Other operational

problems, such as short service hours and/or broken microscopes, and limited access to laboratory culture, reduce diagnostic effectiveness. Infrequent health education to encourage persons to seek help when symptoms arise also contributes to low case detection. Furthermore, fewer than 10 control programs in the Region are conducting regular quality control of services performing smear microscopy.

3.3 *Treatment*

Tuberculosis treatment requires at least six months of therapy. It is well documented that, without supervision of pill-taking, patients tend to abandon treatment well before completion, or to take medication sporadically. Therefore, DOTS was initiated and has now proved cost-effective in very low-income countries. Unlike other Regions, it is a great advantage that a majority of control programs in the Americas adopted the norm of directly-observed treatment a decade or more ago. Most of the countries now vigorously applying that norm rely on service-based administration of therapy. However, many countries have large rural populations often living in areas far from health facilities. Therefore, some programs, such as in Bolivia and Guatemala, are training local volunteers or community-based auxiliaries to provide therapy and are making formal linkages with local-based nongovernmental organizations. In Nicaragua, an effective regimen is used that requires supervision only in the first two months.

Despite these advances, most countries still face serious quality deficiencies in the provision of directly-observed therapy. Often patients receive some or all of their drugs for self-administration in the home due to the perceived difficulty in attempting DOTS and to the absence of local strategies and training to make it possible. As a result, a majority of countries currently cure less than 70% of the cases registered for treatment. Some of those who are not cured develop chronic drug-resistant disease. A decline in incidence and disease transmission is unlikely to occur with these results. Therefore, it is imperative that more countries pursue complete application of DOTS norms and practices and, through the use of initial demonstration areas, confirm that DOTS is feasible and effective.

3.4 *Drug Supply*

Without a regular and secure supply of anti-tuberculosis drugs, tuberculosis control programs can break down, and patients can abandon treatment and/or develop drug resistance. Resources are required to purchase the yearly drug needs as well as a reserve stock, and to ensure timely delivery and supply monitoring. In the Region, the vast majority of control programs benefit from national government procurement of needed drugs, rather than depending on external sources. However, few countries have adequate reserve stocks, and late fund authorization and/or delivery means that national shortages are not uncommon. Local shortages also result from poor distribution systems in some areas.

Lastly, in many countries, rifampicin and other anti-tuberculosis drugs are available for sale in pharmacies without prescriptions. International institutions, ministries of health, pharmaceutical companies, and medical and pharmacy associations will have to collectively investigate how to better encourage rational use and/or control of anti-tuberculosis drugs. Without such actions, the number of multi-drug-resistant patients may rise. Their care is already prohibitively costly for most countries in the Region.

3.5 *Program Monitoring and Evaluation*

Effective tuberculosis control depends on the ongoing surveillance of the disease and its dynamics through case reporting, as well as program monitoring and evaluation. Most important is the analysis of treatment results for cohorts of registered patients. A strength of control programs in the Region is the existence of regular case-reporting norms, albeit with differences in case definitions. A majority of countries produce annual case notification statistics, and those with active programs also produce analyses based on process, output, and outcome indicators. Most Latin American countries now have also adopted the use of treatment registries recommended by WHO and PAHO. However, the coverage and quality of data are still problems in many programs, and local analysis may be inadequate. Sometimes too much data is collected, and it is collected too frequently to ensure accuracy. A critical step, therefore, for many programs is to quickly simplify and standardize their reporting systems.

More than a dozen programs in the Region now perform cohort analysis of treatment outcomes for pulmonary smear-positive patients, although some have serious deficiencies. The cohorts analyzed may not include all cases notified, and outcome definitions do not always correspond to international standards. Table 2 provides data available from 12 countries for cases diagnosed in 1994.[4] Improving standardized cohort analysis will be essential in evaluating the overall effectiveness of control programs. All countries will need to adopt this method to measure progress towards targets and respond to operational problems discovered in the analyses.

Another critical element of tuberculosis control monitoring systems must now be drug-resistance surveillance. In 1995, WHO and international partners formed an international working group to conduct nationally representative sample surveys of anti-tuberculosis drug resistance levels. In 1996, 10 countries in the Americas have conducted, or are conducting, surveys based on a standardized protocol: Argentina, Bolivia, Canada, Chile, Dominican Republic, Mexico, Nicaragua, Paraguay, Peru, and

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[4] Some other countries, including Cuba and the United States, perform regular evaluation of treatment by cohorts, but results for 1994 cases were not available at the time of this report.

United States of America. The surveys in Argentina and the United States have recently been completed *(15, 16)*. They provide evidence of increased initial multi-drug resistance in the 1990s.

4. Proposed Short-term Objectives

In order to achieve the global year 2000 cure rate and case-finding targets set by the World Health Assembly, the following objectives will need to be pursued immediately by control programs and those assisting them:

- improve implementation of effective DOTS strategies, first in demonstration areas and, when proven effective there, nationally;

- improve use of standardized evaluation methods for case-finding (including laboratory quality control) and treatment, to measure the progress of districts/areas, regions, and national programs towards the global control targets;

- support the above objectives by mobilizing and sustaining resources for adequate drug supply, personnel supervision, training, and program evaluation.

5. The Role of PAHO/WHO

5.1 *Activities*

To pursue the strategy and objectives proposed above to effectively control tuberculosis in the Region, the PAHO/WHO Secretariat will need to redouble its efforts in the following areas:

- Providing information, training, and management tools and scientific information to all countries;

- Providing technical cooperation for creation and/or expansion of DOTS demonstration areas, with a focus on high-incidence countries;

- Fostering creation of national technical advisory groups and interagency groups;

- Advocating at regional and subregional levels for efficient investment in tuberculosis control;

- Holding regional and subregional meetings to stimulate intercountry problem-solving and -sharing lessons from successes;

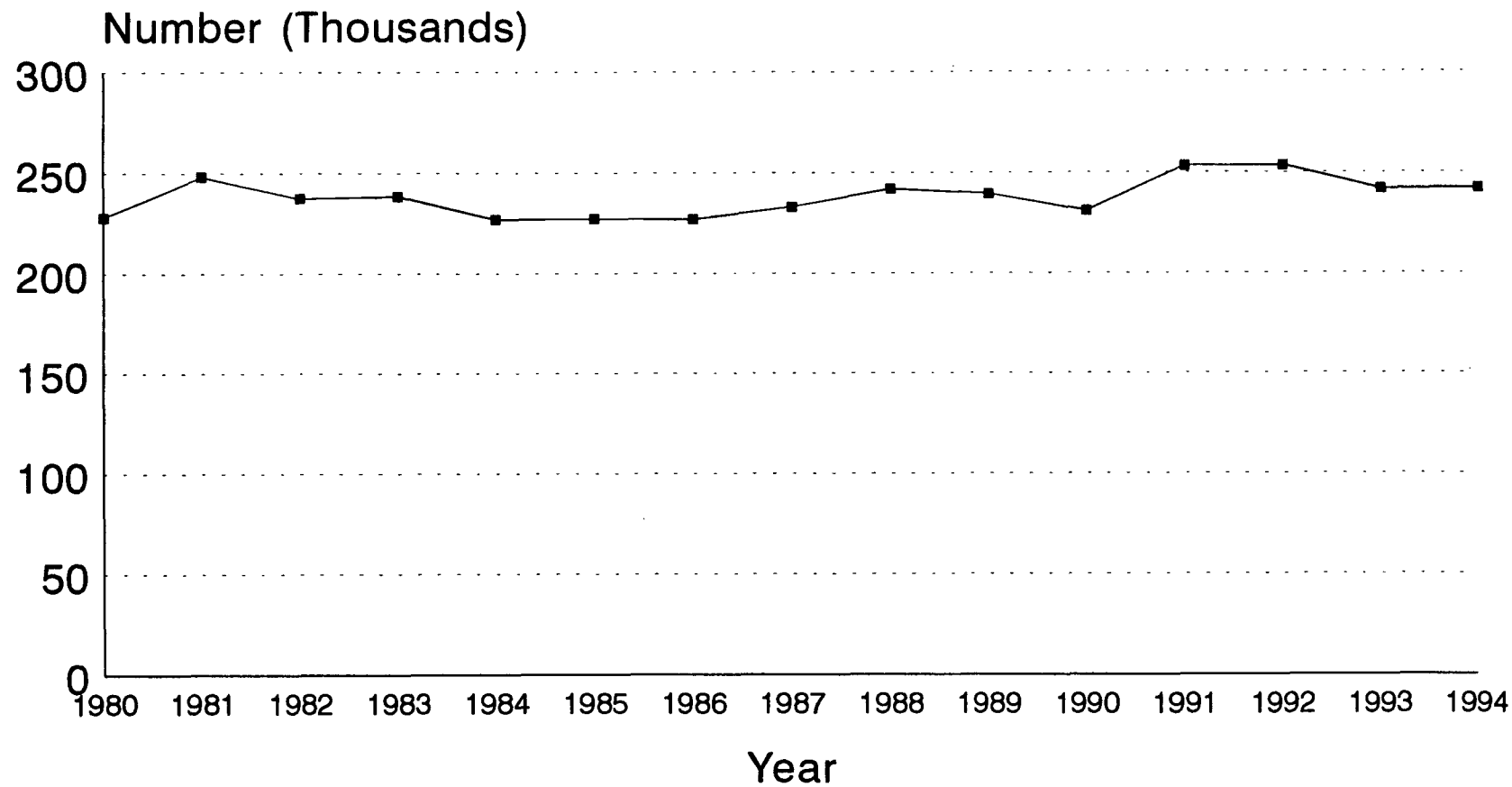
- Supporting intercountry visits, course participation, and operational research.

5.2 *Budget*

In 1996, an estimated total of US$ 3.84 million was made available for investment in tuberculosis control in the Region by PAHO/WHO. At the country level, approximately $320,000 was budgeted by the PAHO/WHO Representations for tuberculosis control activities and estimated staff time. At the regional level, approximately $519,000 was budgeted in 1996 for tuberculosis control activities and staff, including resources provided by the regular budget of PAHO's Communicable Disease Program and by extrabudgetary resources of the Global Tuberculosis Programme of WHO. PAHO received the following amounts directly from extrabudgetary sources: approximately $2.5 million for the National Tuberculosis Control Program in Bolivia; $395,000 for a tuberculosis control project in Haiti; $94,000 for tuberculosis control activities at the US-Mexico border; and $10,000 for a version in Spanish of the WHO annual report on the tuberculosis epidemic.

In order to better serve the needs of national tuberculosis control programs, the Secretariat will need to seek additional support over the next two years for a phased increase in technical cooperation with and between countries, for training, for evaluation and for operational research activities.

Figure 1: Reported Tuberculosis Cases
Region of the Americas, 1980-1994



Source: Ministry of Health reports provided to PAHO and WHO
Note: in 1993 and 1994, no reports received from Rio de Janeiro state, Brazil
No reports received from Haiti in 1990, 1992-1994

TABLE 1
REPORTED TUBERCULOSIS CASES, 1994

Country	Cases (All forms)	Rates per 100,000	SM+PULM Cases	Rate per 100,000
Argentina	13,683	40.0	5,696	16.7
Bahamas	78	48,4	41	na
Belize	59	28,1	36	17.1
Bolivia	9,431	130.3	6,905	95.4
Brazil	75,759	47.6	39,167	24.6
Canada	2,074	7.4	na	na
Chile	4,138	29.5	1,951	13.9
Colombia	8,901	25.8	6,532	18.9
Costa Rica	325	9.7	230	6.9
Cuba	1,681	15.3	914	8.3
Dominica	12	16.9	8	11.3
Dominican Republic	4,337	55.8	3,177	40.9
Ecuador	9,685	86.3	6,674	59.5
El Salvador	3,901	69.2	2,144	38.0
French Guiana	28	25.2	na	na
Grenada	3	3.3	3	3.3
Guadeloupe	41	10.0	na	na
Guatemala	2,676	25.9	1,994	19.3
Guyana	266	32.2	61	7.4
Honduras	4,291	78.1	2,385	41.1
Jamaica	109	4.5	61	2.5
Martinique	54	14.4	na	na
Mexico	16,353	17.8	9,726	10.6
Nicaragua	2,750	64.3	1,615	37.8
Panama	827	32.0	748	28.9
Paraguay	1,850	38.3	873	18.1
Peru	48,601	208.3	33,925	145.4
Puerto Rico	274	7.5	na	na
Saint Kitts and Nevis	2	4.9	2	4.9
Saint Lucia	24	17.0	na	na
Saint Vincent	0	0.0	0	0.0
Suriname	53	12.7	na	na
Trinidad and Tobago	129	10.0	55	4.3
United States of America	24,361	9.4	14,346	5.5
Uruguay	666	21.0	381	12.0
Venezuela	4,877	22.8	2,738	12.8
Virgin Islands (UK)	0	0.0	na	na
Virgin Islands (USA)	10	9.6	na	na
Total	242,309		142,388	

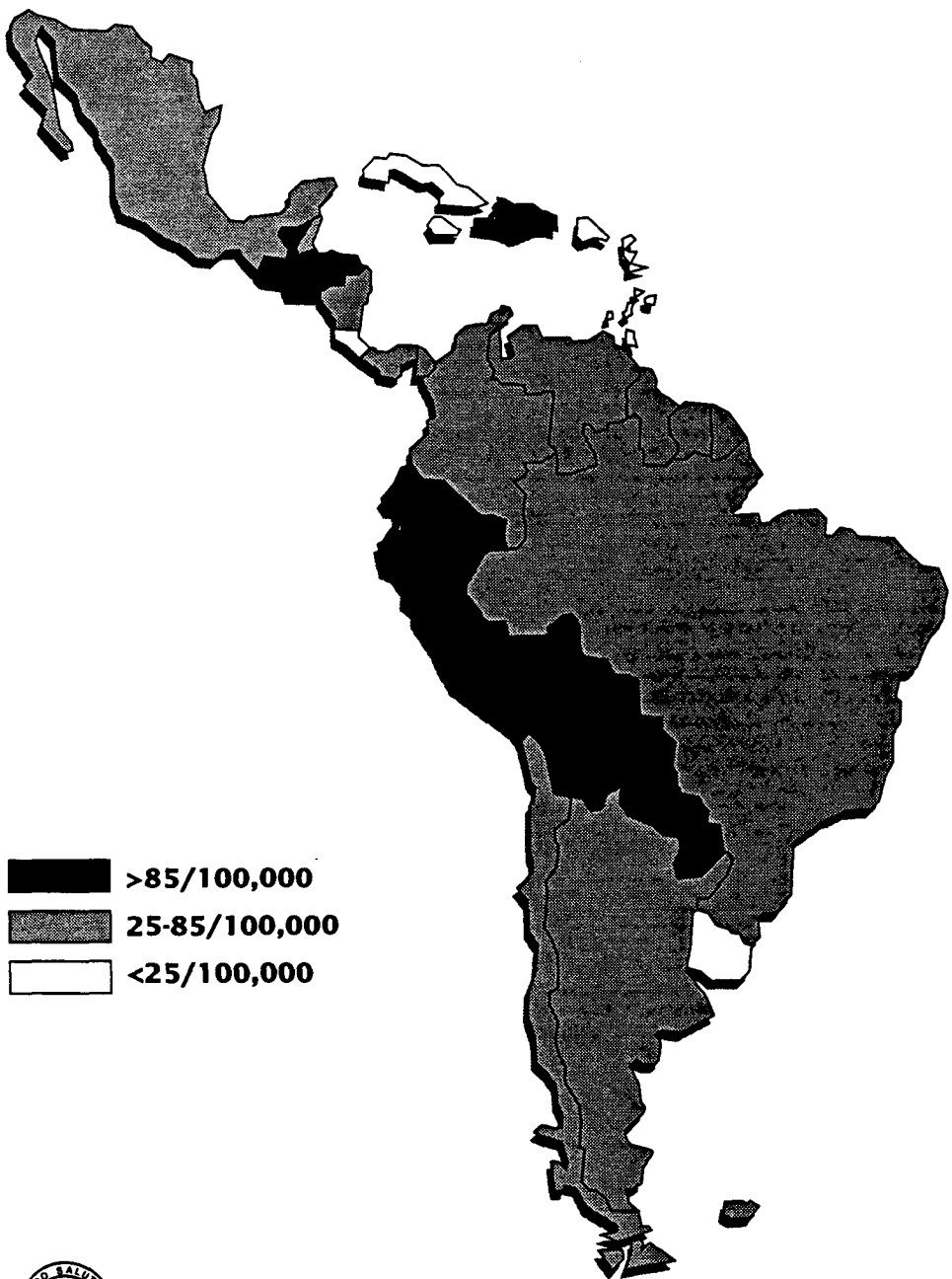
Sources: Reports from Ministries of Health received by PAHO and WHO
Data for Puerto Rico and U.S. Virgin Islands received from US Centers for Disease Control and Prevention;
Population estimates used for rate: United Nations/CELADE.

1994 reports not received from: Anguilla, Antigua and Barbuda, Barbados, Bermuda, Haiti, Cayman Islands, Montserrat, Netherlands Antilles, Turks and Caicos.

SM + PULM: smear-positive pulmonary cases; na: not available.

Figure 2

Estimated Tuberculosis Incidence, 1995
Latin America and the Caribbean



Pan American Health Organization

TABLE 2
RESULTS OF TREATMENT OF SMEAR-POSITIVE PULMONARY (SM+) TUBERCULOSIS CASES NOTIFIED AND ANALYZED IN SELECTED COUNTRIES, 1994

RESULTS	ARG	BOL	BRA*	CHI	GUA	HON
% CURED •	-	52.9	-	-	67.9	-
% COMPLETED	62.8	21.2	77.8	82.6	17.5	75.1
% ABANDONED	21.5	13.9	15.4	9.2	6.1	7.9
% FAILED	1.5	0.1	1.7	1.4	1.4	0.9
% DIED	5.7	3.8	2.9	5.6	3.6	9.3
% TRANSFERRED	5.9	7.2	2.2	6.4	3.4	6.9
SM+ NOTIFIED	5,696	6,905	**38,410	1,951	1,994	2,417
ANALYZED	♦917	6,124	***	o1,081	1,721	995
% SM+ ANALYZED	16	89	~25	55	86	41

- • Completed treatment with confirmation of smear negativity at completion
- ♦ Partial analysis of cases notified in 4th quarter
- * Self-administered short-course therapy with fixed drug combinations
- ** 15 years or older
- *** The last month of each quarter's notified cases is analyzed
- o Represents cases notified in first semester of year (2nd semester analysis in preparation)

RESULTS	MEX	NIC	PAR	PER	URU	VEN
% CURED •	-	65	14.5	75.0	47.2	-
% COMPLETED	75	16	55.0	11.1	37.3	80.5
% ABANDONED	11	7	25.6	7.0	3.7	9.1
% FAILED	4	3	0.0	2.1	0.5	1.1
% DIED	5	5	2.9	3.1	10.2	4.3
% TRANSFERRED	4	5	2.2	1.7	1.1	5.0
SM+ NOTIFIED	♦9,974	1,615	873	34,515	381	°2,738
ANALYZED	♦♦6,683	1,590	585	**27,050	373	°°2,184
% SM+ ANALYZED	67	98	67	***78	98	80

- • Completed treatment with confirmation of smear negativity at completion
- ♦ Excludes those notified by institutions other than Secretary of Health
- ♦♦ Those receiving supervised therapy by Secretary of Health
- ** Excludes cases treated by Social Security Institute
- *** 95% of MOH cases analyzed
- o Smear or culture positive
- oo Over 15 years old

Source: Reports received from Ministries of Health

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