

Tuberculosis in the Americas

Regional Report 2013

Epidemiology, Control and Financing



**Pan American
Health
Organization**



REGIONAL OFFICE FOR THE

**World Health
Organization**

Americas

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Abbreviations

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
CDR	Case detection rate
CPT	Co-trimoxazole preventive therapy
DOT	Directly observed treatment
DOTS	The basic package that underpins the Stop TB Strategy
DRS	Drug resistance surveillance or survey
DST	Drug susceptibility testing
EQA	External quality assurance
GDP	Gross Domestic Product
GLC	Green Light Committee
GNI	Gross national income
HIV	Human immunodeficiency virus
IPT	Isoniazid preventive therapy
MDG	Millennium Development Goal
MDR-TB	Multidrug-resistant tuberculosis
NTP	National tuberculosis control program or equivalent
PAHO	Pan American Health Organization
PTB	Pulmonary TB
TB	Tuberculosis
UNAIDS	Joint United Nations Program on HIV/AIDS
WHO	World Health Organization
XDR-TB	Extensively drug-resistant TB

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Executive Summary

The purpose of this report is to provide a comprehensive, regular update on the current tuberculosis (TB) situation in the Americas region in terms of estimated incidence, prevalence, mortality and a number of other indicators useful in evaluating TB control efforts. The contents of the report are based on TB surveillance and control data that are routinely collected by the World Health Organization on an annual basis. The principal findings are summarized below.

In 2012, approximately 276,000 incident cases of TB are estimated to have occurred in the region. Despite population growth, this is thought to be a reduction of about 7,000 cases from the previous year. The estimated rate per 100,000 population is estimated at 29, a slight reduction from that of 2011. Incidence reductions were estimated across all sub-regions of the Americas. The majority of cases (67%) are estimated to have occurred in the South American region, largely driven by the continued high burden in Brazil and Peru which together accounted for 43% of the total estimated number of incident cases for the year. Other countries with estimated incidence of more than 20,000 cases are Mexico and Haiti. In terms of rates, Haiti has the highest estimated incidence rate in the region at 213 per 100,000. Although Brazil reported the highest number of cases, its incidence rate is estimated at 46 per 100,000, reflecting its large population size. The general trend in the region is toward a decrease or plateau in TB incidence.

Estimated prevalence in the region in 2012 was about 389,000. About two-thirds (66%) of this is thought to have occurred in South America. Approximately 19,000 TB deaths were estimated among the HIV-negative TB patient population. This represents a TB mortality rate of about 2 per 100,000 population.

Among pulmonary TB (PTB) cases, approximately 7,000 of these were estimated to have multi-drug resistant TB (MDR-TB). This represents about 2% of new pulmonary cases and 14% of re-treatment pulmonary cases. Peru and Brazil alone accounted for more than half of all estimated MDR-TB in the region.

About 32,000 incident TB cases were thought to be HIV-positive in 2012. This represents about 12% of estimated incidence. Just over 50% of the total regional estimated burden is in Brazil. However, the prevalence of HIV among TB cases is highest in Haiti at 42%.

Of the estimated 276,000 incident TB cases, about 233,000 were detected and notified, which represents a case detection rate of 79% for the region. Of notified cases, 90% were new and 10% re-treatment. Across the region as a whole, 83% of notifications were pulmonary TB and 16% extra-pulmonary disease. Of the PTB, 71% were reported to be smear-positive. About 64% of all notifications were male, leading to a 1.8 male to female ratio across all age groups. Of notified cases, about 5% (9,700) were under 15 years of age. About 20% of these were smear-positive disease.

Treatment success targets have yet to be achieved in the Americas. However, overall 78% of the 2011 treatment cohort was successfully treated. Treatment success rates among re-treatment cases and MDR-TB patients were 51% and 59%, respectively. The highest overall treatment success rates were seen in Mexico & Central America (87%) and the Caribbean (84%).

Of the approximately 7,000 MDR-TB cases estimated to have occurred in 2012, only about 3,000 were detected and notified in the Americas. Peru and Brazil accounted for 64% of notified cases. The estimated MDR-TB case detection rate was highest in North America (>100%) and lowest in the Caribbean (24%). Of the notified MDR-TB cases, 92% were placed on second-line drug therapy. In 2012, 98 extensively drug-resistant (XDR) TB cases were reported in the Americas, representing a 26% increase over that which was reported the previous year.

Among TB cases notified in the Americas in 2012, 57% were tested for HIV. Of those tested, 16% were found to be HIV-positive. The proportion tested has been steadily increasing over time, while the proportion of those testing positive has been consistent over the last six years. Although reporting is incomplete, 64% of HIV-positive TB patients for whom data are available were placed on co-trimoxazole preventive therapy (CPT) and 77% on antiretroviral therapy (ART). Approximately 4,500 HIV-positive individuals were screened for TB across the region. However, nearly 19,000 were placed on isoniazid preventive therapy (IPT).

A total of 23 countries reported on laboratory capacity and external quality assurance (EQA) of laboratories in 2012. Of the 23 reporting data, 17 have reached the target of at least one laboratory per 100,000 population doing smear microscopy. For culture services, 14 countries reported having achieved the target of at least one laboratory per million inhabitants. And for drug susceptibility testing (DST), 9 countries have at least one laboratory per 5 million population.

The region has made good progress toward achieving the global TB control targets. Incidence is estimated to have been declining steadily across the region. Regional prevalence is estimated to have been 61% lower in 2012 relative to 1990, and mortality 68%. The only sub-region not to have achieved the prevalence and mortality decline targets was the Caribbean. The case detection and treatment success targets have not yet been achieved either in the region as a whole or in the sub-regions.

Introduction

This report was produced and published by the Regional Tuberculosis Program of the Pan-American Health Organization (PAHO). Its purpose is to provide a comprehensive overview of the current epidemiology of tuberculosis (TB) in the Americas, as well as reporting on efforts towards TB control in the region.

All analyses presented in this report are based on data submitted by the countries of the Americas to PAHO and the World Health Organization (WHO) during the 2013 data collection activities for the Global TB Report. Data are presented for the Americas as a whole, five sub-regions and 36 countries. The sub-regions are characterized in **Table 1**. Some data from territories reporting TB data to the WHO are also included.

TABLE 1. Region of the Americas, country and sub-regional divisions with population data, 2012

Sub-region/country	Population
North America	352,343,244
Canada	34,837,978
United States	317,505,266
Caribbean	40,787,214
Antigua and Barbuda	89,069
Bahamas	371,960
Barbados	283,221
Cuba	11,270,957
Dominica	71,684
Dominican Republic	10,276,621
Grenada	105,483
Haiti	10,173,775
Jamaica	2,768,941
Puerto Rico	3,694,237
Saint Kitts and Nevis	53,584
Saint Lucia	180,870
Saint Vincent and the Grenadines	109,373
Trinidad and Tobago	1,337,439
Mexico & Central America	165,086,917
Belize	324,060
Costa Rica	4,805,295
El Salvador	6,297,394
Guatemala	15,082,831
Honduras	7,935,846
Mexico	120,847,477
Nicaragua	5,991,733
Panama	3,802,281
South America (Andean)	133,635,558
Bolivia	10,496,285
Colombia	47,704,427
Ecuador	15,492,264
Peru	29,987,800
Venezuela	29,954,782
South America (other)	268,620,284
Argentina	41,086,927
Brazil	198,656,019
Chile	17,464,814
Guyana	795,369
Paraguay	6,687,361
Suriname	534,541
Uruguay	3,395,253
The Americas	960,473,217

CHAPTER 1

The Regional Burden of Tuberculosis

The burden of TB in the Americas is measured in terms of estimated incidence, prevalence and mortality. Incidence is defined as the total new and relapse cases occurring during the year, while prevalence is the average number of cases that exist at any point in time during the year. As such, prevalent cases include those that were diagnosed in earlier years but have not yet finished treatment. Mortality is represented by all the deaths due to tuberculosis during the year. In theory, this should include only those deaths that are due to tuberculosis, not those who died with TB, but due to a different underlying cause. However, due to variations in reporting methods and estimate assumptions, this is challenging to measure accurately. Estimates of incidence, prevalence and mortality include diagnosed and undiagnosed cases, with notified cases forming a subset of the total estimates.

In terms of trends over time, every effort is made to use existing data to estimate year-over-year changes in the burden of TB. However, as changes to surveillance systems occur, reporting practices may worsen or improve and estimation methodology may change over time, trends should be viewed with caution.

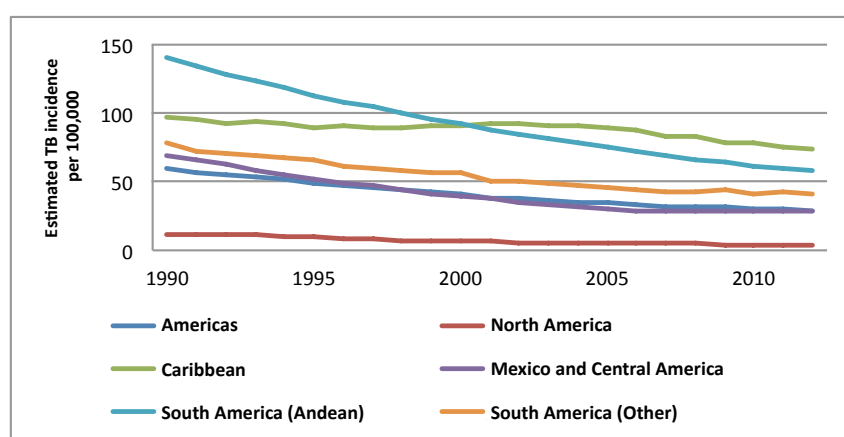
1.1 Incidence

In the year 2012, an estimated 276,235 (uncertainty range 231,151 – 327,510) incident cases of TB occurred in the Americas. As a rate, this is expressed as 29 per 100,000 population, with an uncertainty range of 24 to 34 per 100,000. This represents a 3.6% decline relative to the previous year's estimated incidence rate.

Sub-regional incidence rates are highest in the Caribbean region (74 per 100,000) and lowest in North America (4 per 100,000). However, the largest number of cases is found in the South America (other) region due to the particularly large burden in Brazil. The highest incidence rate in the Americas is thought to be in Haiti (213 per 100,000). The lowest calculated incidence rates are in a handful of small Caribbean nations, the United States, and Canada where incidence is estimated at less than 5 per 100,000 population.

Incidence as a whole in the region is thought to have been in decline since 1990, though the magnitude of the decline has been less dramatic recently. However, incidence and its trend over time vary considerably by country and sub-region (Figure 1).

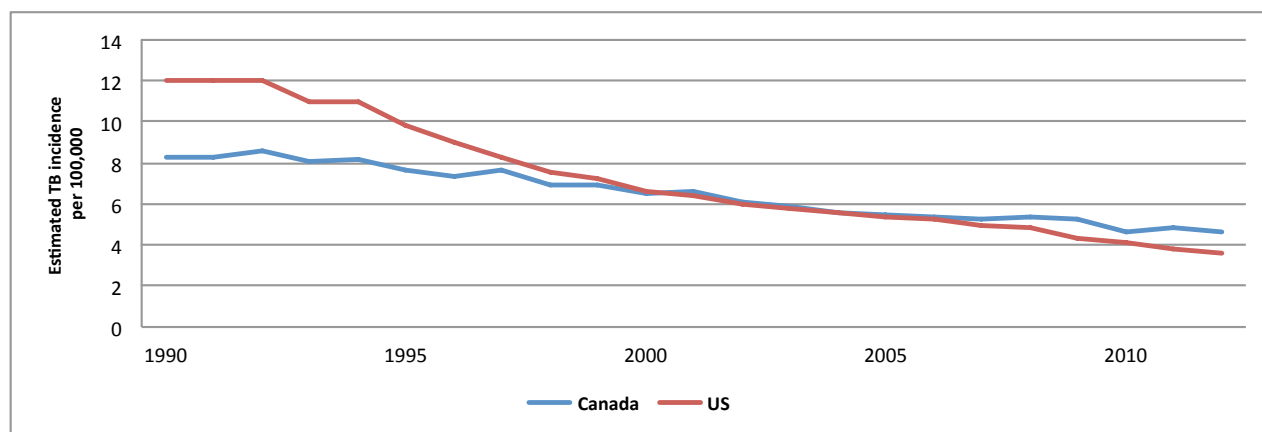
FIGURE 1. Estimated TB incidence per 100,000 by sub-region, 1990 – 2012



1.1.1 North America

There were an estimated 12,600 (uncertainty range 11,400 – 14,800) incident TB cases in North America in 2012, with about 11,000 in the United States and 1,600 in Canada. This translates into an incidence rate of 3.6 per 100,000 for North America and the US and 4.6 for Canada (**Figure 2**). In the US and Canada, reported cases are thought to be a fairly accurate reflection of the underlying incidence. These two countries contributed approximately 5% of the total regional incidence.

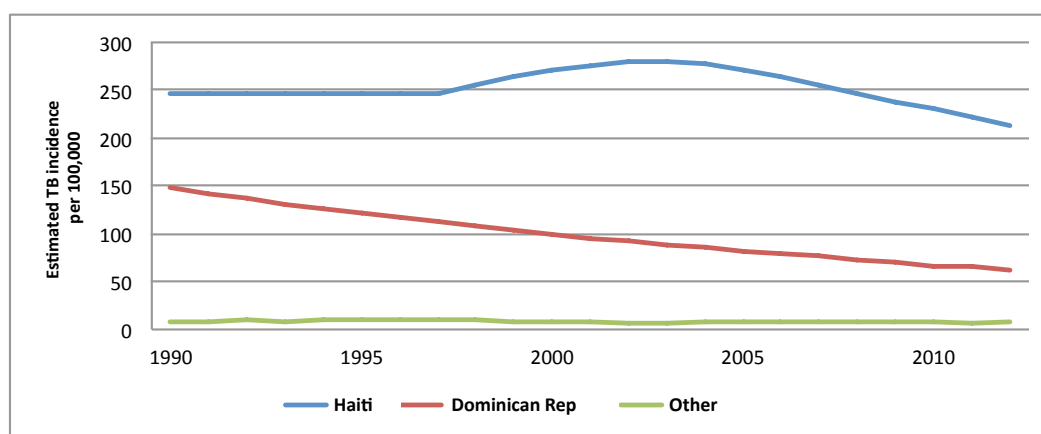
FIGURE 2. Estimated incidence per 100,000 in North America, 1990-2012



1.1.2 Caribbean

Approximately 31,000 (uncertainty range 24,714 – 35,665) new cases of TB are estimated to have occurred in the Caribbean in 2012, most of which were in Haiti (22,000 or 73%). However, the uncertainty range around the estimates for Haiti is wide at 18,000 – 26,000. The next highest burden in this sub-region is thought to be in the Dominican Republic (point estimate 6,400; uncertainty range 5,300 -7,600; 21% of sub-regional total). The third highest burden is in Cuba, but the total incidence is much lower (point estimate 1000; uncertainty range 840 – 1,300) than Haiti and the Dominican Republic. The estimated incidence rates for Haiti, the Dominican Republic and Cuba are 213 (uncertainty range 176 – 254), 62 (uncertainty range 51 – 74) and 9 (uncertainty range 7.4 – 11) per 100,000, respectively. The estimated incidence rate in Haiti is the highest in the entire Americas. Incidence in Haiti was thought to be increasing until around 2003 after which data suggest that it is declining. Limited data exist from the 1990's, so the incidence was estimated to have been flat until 1998 (**Figure 3**).

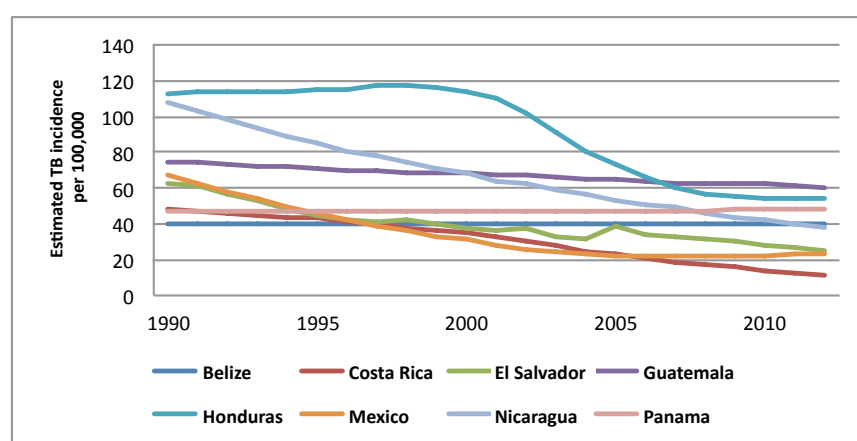
FIGURE 3. Estimated incidence per 100,000 in the Caribbean, 1990-2012



1.1.3 Mexico and Central America

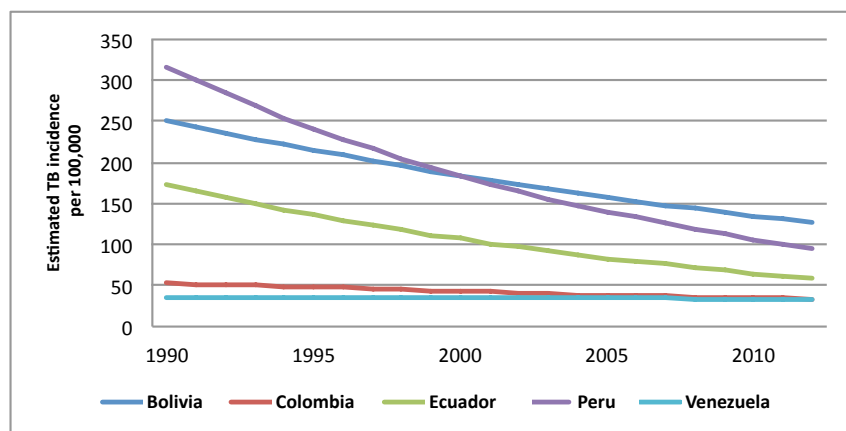
The total estimated burden in Mexico and Central America for 2012 is 46,740 (uncertainty range 38,850 – 56,340). The highest burden in this sub-region is thought to exist in Mexico, with an estimated 27,000 (uncertainty range 23,000 – 32,000) new cases in 2012, which is 58% of the sub-regional total. The next highest burden is thought to be in Guatemala where the estimate is 9,100 (uncertainty range 7,500 – 11,000) incident cases for the year. However, the incidence rate is much higher in Guatemala (60 vs. 23 per 100,000 in Mexico). The remaining incidence numbers and rates are 4,300 (uncertainty range 2,800 – 6,100) and 54 (uncertainty range 35 – 77) per 100,000 for Honduras; 2,300 (uncertainty range 2,000 – 2,700) and 38 (uncertainty range 33 – 44) per 100,000 for Nicaragua, 1,800 (uncertainty range 1,600 – 2,000) and 48 (uncertainty range 42 – 54) per 100,000 for Panama; 1,600 (uncertainty range 1,400 – 1,800) and 25 (uncertainty range 22 – 29) per 100,000 for El Salvador; 510 (uncertainty range 440 – 580) and 11 (uncertainty range 9.3 – 12) per 100,000 for Costa Rica; and 130 (uncertainty range 110 – 160) and 40 (uncertainty range 33 – 48) per 100,000 for Belize (Figure 4).

FIGURE 4. Estimated incidence per 100,000 in Mexico & Central America, 1990-2012



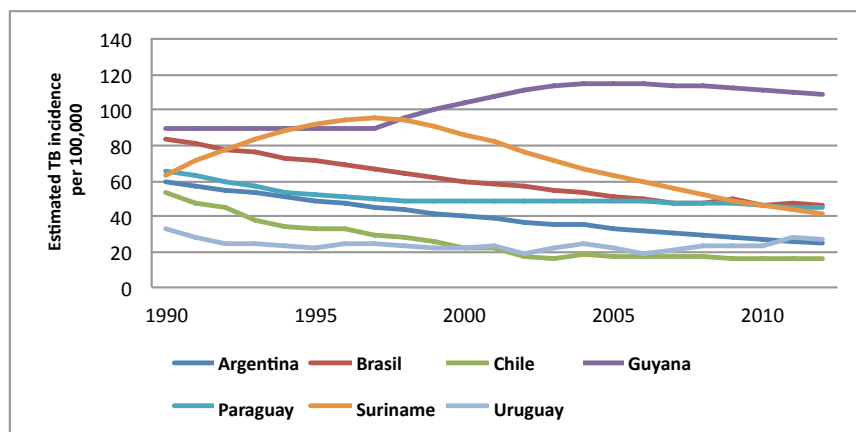
1.1.4 South America (Andean)

Of the 77,000 (range 64,700 – 90,000) estimated new cases in the Andean region of South America, 29,000 (38%) are thought to have occurred in Peru. In order of descending number of incident cases, the remaining countries are as follows: Colombia (point estimate 16,000; uncertainty range 13,000 – 19,000), Bolivia (point estimate 13,000; uncertainty range 11,000 – 16,000), Venezuela (point estimate 9,900; uncertainty range 8,200 – 12,000) and Ecuador (point estimate 9,100; uncertainty range 7,500 – 11,000). However, in terms of disease density or the incidence rate, the highest density of TB occurred in Bolivia with an estimated rate of 127 (uncertainty range 105 – 151) per 100,000, followed by Peru (point estimate 95; uncertainty range 83 – 108), Ecuador (point estimate 59; uncertainty range 48 – 70), Colombia and Venezuela (point estimates 33; uncertainty range 27 – 29) (Figure 5).

FIGURE 5. Estimated incidence per 100,000 in Andean South America, 1990-2012

1.1.5 South America (other)

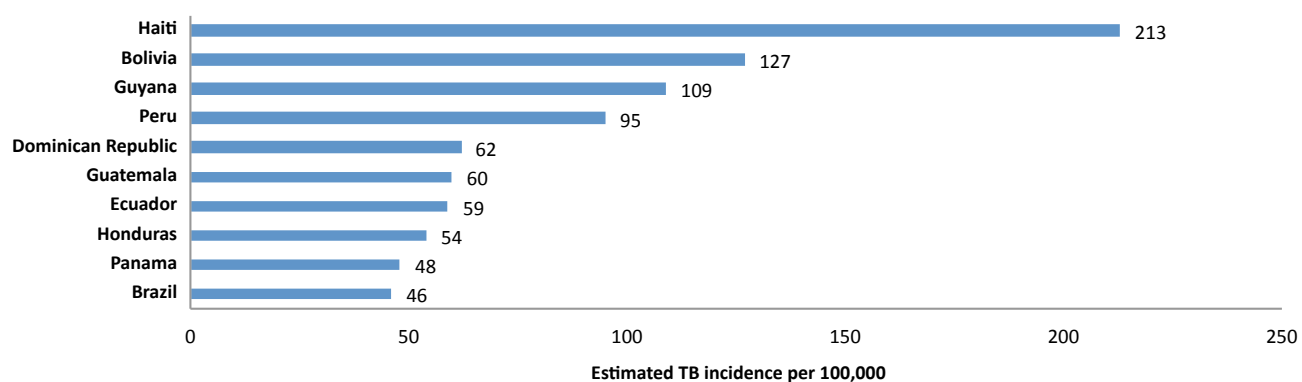
In the remaining South American countries, Brazil maintains its place as the highest burden country both in the sub-region and the Americas region as a whole. With an estimated incidence of 92,000 (uncertainty range 76,000 – 110,000), Brazil accounts for over 80% of the estimated burden in this South American sub-region and 33% of that of the entire Americas.

FIGURE 6. Estimated incidence per 100,000 in South America (other), 1990-2012

The following table and figure indicate the top 10 countries in the Americas in terms of the number and rate of incident cases in 2012 (**Table 2**). Note the 10-fold difference in the number of new cases in the highest ranked country (Brazil) and the number 10 ranked country (Guatemala). Also note that, although Brazil has the highest number of cases, its disease density (incidence rate) is significantly lower than many other countries in the region due to its large population size (**Figure 7**).

TABLE 2. Top 10 countries by estimated number of incident cases, 2012

Rank	País	Nuevos casos de TB (rango de incertidumbre)	%	% acumulado
1	Brasil	92.000 (76.000 - 111.000)	33%	33%
2	Perú	29.000 (25.000 - 32.000)	10%	44%
3	México	27.000 (23.000 - 32.000)	10%	54%
4	Haití	22.000 (18.000 - 26.000)	8,0%	62%
5	Colombia	16.000 (13.000 - 19.000)	5,8%	67%
6	Bolivia	13.000 (11.000 - 16.000)	4,7%	72%
7	Estados Unidos	11.000 (10.000 - 13.000)	4,0%	76%
8	Argentina	10.000 (8.600 - 12.000)	3,6%	80%
9	Venezuela	9.900 (8.200 - 12.000)	3,6%	83%
10	Ecuador	9.100 (7.500 - 11.000)	3,3%	87%
10	Guatemala	9.100 (7.500 - 11.000)	3,3%	90%

FIGURE 7. Top 10 countries by estimated TB incidence rate per 100,000, 2012

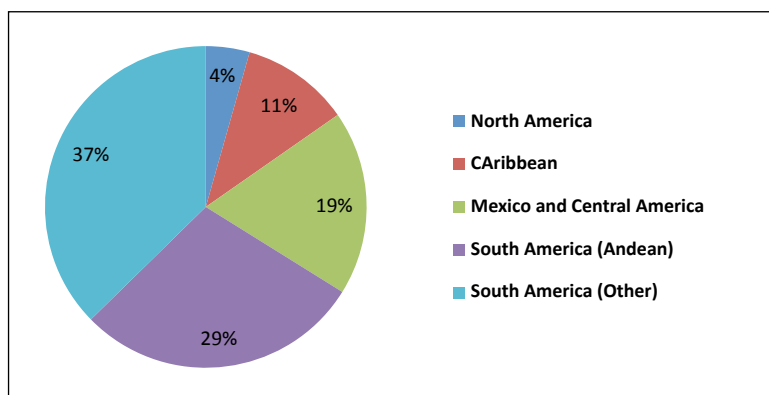
1.2 Prevalence

Prevalence is a function of both incidence and disease duration. Disease duration is a function of diagnostic delay, treatment duration and outcome. Where cases are not identified rapidly after developing active disease and their illness lingers, prevalence will be higher.

The estimated number of prevalent TB cases in the region in 2012 was 388,933, which translates to a rate of 40 per 100,000 population. However, because it is very challenging to estimate average disease duration at the national level, there is considerable uncertainty around estimates of prevalence. As such the uncertainty range of the regional esti-

mate is 171,264 – 687,203 or 18 – 72 per 100,000 population. The sub-regional prevalence rates ranged from 5 to 104 per 100,000 population.

FIGURE 8. Proportion of total prevalence in the Americas by sub-region, 2012

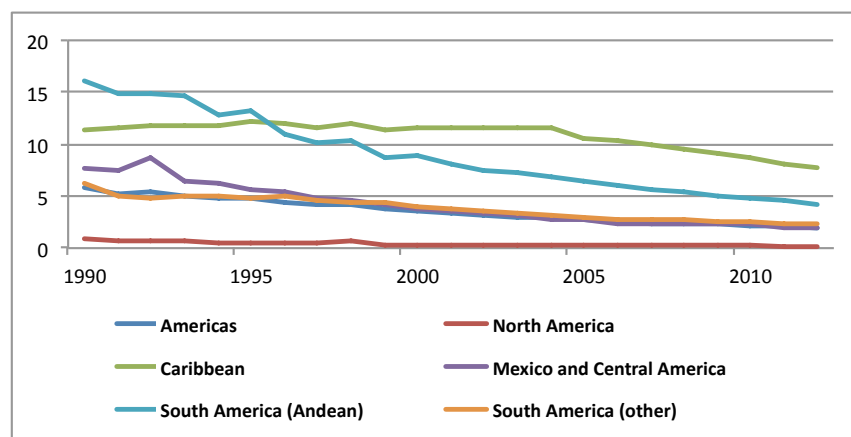


1.3 Mortality

In 2012, an estimated 18,553 (uncertainty range 13,959 – 24,869) deaths occurred among HIV-negative TB cases in the Americas region. This represents a mortality rate of 1.9 (uncertainty range 1.5 – 2.6) per 100,000 population. Data suggest that TB mortality has been declining in the region and sub-regions over the past 20 years. The highest rates of TB mortality in the region are estimated to be in the Caribbean, and the lowest mortality in North America. The rates are 7.7 (uncertainty range 3.6 – 14) and 0.14 (uncertainty range 0.13 – 0.16) per 100,000, respectively (**Figure 9**).

TB deaths among HIV-positive individuals are not well-known as HIV status is not known for many patients. The estimates of mortality amongst HIV-negative cases are made based on assumptions of the proportion of TB patients with HIV. However, treatment outcomes data are only known for a sub-set of the TB/HIV cohort.

FIGURE 9. Estimated TB mortality (HIV-negative) per 100,000 in the Americas and its sub-regions, 1990-2012



1.4 MDR-TB

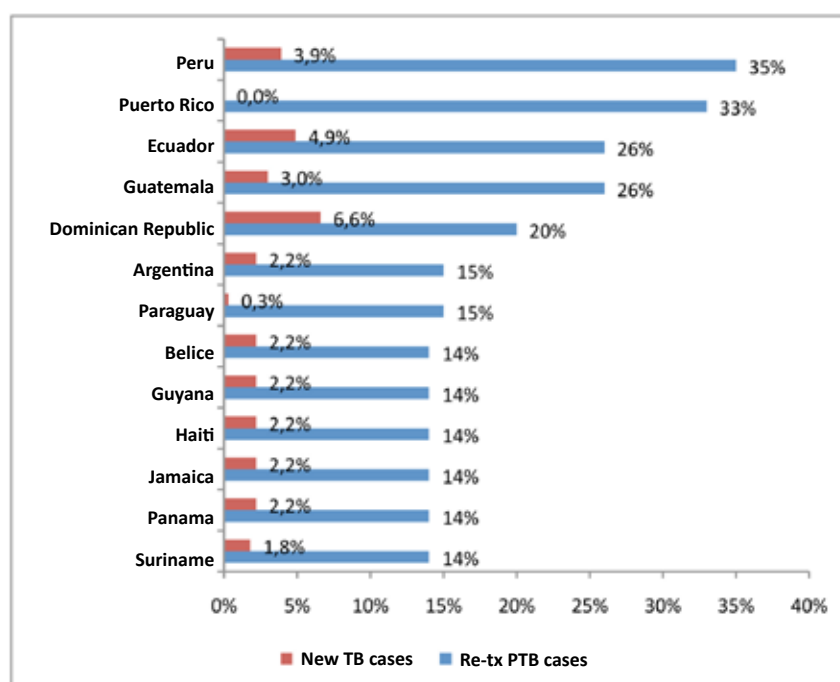
There were an estimated 6,962 (uncertainty range 5,311 – 9,108) multi-drug resistant (MDR) TB cases among notified pulmonary TB (PTB) cases in 2012 in the Americas (**Table 3**). Peru and Brazil accounted for more than half of all estimated MDR-TB cases in the region.

TABLE 3. Top 10 countries by estimated MDR-TB cases and proportion of notified PTB cases that are MDR-TB, 2012

Rank	Country	Estimated MDR-TB cases	%	Cumulative %
1	Peru	2,200	32%	32%
2	Brazil	1,700	24%	56%
3	Mexico	480	6.9%	63%
4	Haiti	390	5.6%	69%
5	Ecuador	380	5.5%	74%
6	Argentina	340	4.9%	79%
7	Dominican Republic	330	4.7%	84%
8	Colombia	310	4.5%	88%
9	Bolivia	150	2.2%	90%
10	Guatemala	140	2.0%	92%

MDR-TB cases represent about 2% of new pulmonary cases and 14% of re-treatment pulmonary cases. Across countries, the proportions are highly variable (**Figure 10**). The range for the proportion of new pulmonary TB cases that are MDR-TB is 0% to 7%. The range for the proportion of re-treatment PTB is 0% to 35%.

FIGURE 10. Proportion of notified PTB cases estimated to have MDR-TB, 2012*



*Countries reporting fewer than 50 cases excluded

1.5 TB/HIV

In 2012, there were an estimated 31,600 (uncertainty range 27,113 – 38,890) incident TB cases with HIV in the Americas. This represents 11% of total estimated incidence with variations between sub-regions (**Table 4**).

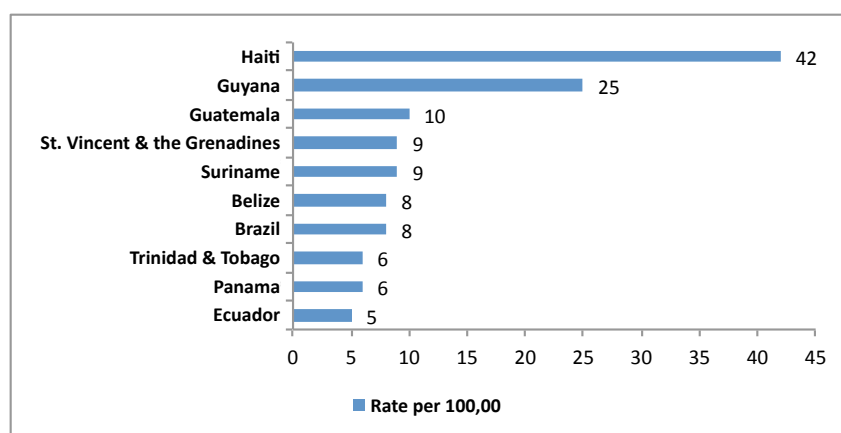
TABLE 4. Estimated incidence of HIV-positive TB cases by sub-region, 2012

Region	Incident HIV+ TB (uncertainty range)	% of incident TB
North America	1,210 (1,056 - 1,320)	10%
Caribbean	5,035 (4,095 - 5,989)	17%
Mexico & Central America	3,837 (4,405 - 6,084)	8%
South America (Andean)	4,560 (3,730 - 5,370)	6%
South America (other)	16,981 (13,827 - 20,127)	15%

The estimated number of incident HIV-positive TB cases is notably highest in Brazil, which represents just over 50% of the total regional estimated burden (**Table 5**). However, the incidence rate of all incident TB cases with HIV is highest in Haiti with 42 per 100,000 population. The estimated rate of HIV amongst incident TB cases were revised downwards for several countries this year, including revision to historical estimates (**Figure 11**).

TABLE 5. Top 10 countries by estimated numbers of HIV+ incident TB cases, 2012

Rank	Country	Incident HIV+ TB (uncertainty range)	% of regional total
1	Brazil	16,000 (13,000 - 19,000)	51%
2	Haiti	4,300 (3,500 - 5,100)	14%
3	Colombia	1,600 (1,300 - 1,900)	5%
4	Mexico	1,600 (1,400 - 1,800)	5%
5	Guatemala	1,500 (1,200 - 1,800)	5%
6	Venezuela	1,200 (940 - 1,400)	4%
7	United States	1,100 (960 - 1,200)	3%
8	Ecuador	840 (700 - 1,000)	3%
9	Dominican Republic	540 (440 - 640)	2%
10	Peru	490 (430 - 550)	2%

FIGURE 11. Top 10 countries by estimated rate of HIV among incident TB cases, 2012

The following tables summarize the estimated burden of TB in the Americas in 2012.

TABLE 6. Estimated burden of TB in the Americas region in absolute numbers, 2012

Region	Incidence		Prevalence	Mortality	MDR-TB
	All forms	HIV+	All forms	HIV-neg	Among PTB cases
North America	12,600	1,210	17,100	507	88
Caribbean	30,075	5,035	42,453	3,154	749
Mexico & Central America	46,740	3,837	72,170	3,237	818
South America (Andean)	77,000	4,560	112,000	5,610	3,140
South America (other)	109,820	16,981	145,210	6,045	2,167
Americas	276,226	31,623	388,933	18,553	6,962

TABLE 7. Estimated burden of TB in the Americas region in rates per 100,000, 2012

Region	Incidence		Prevalence	Mortality	MDR-TB
	All forms	HIV+	All forms	HIV-neg	Among PTB cases
North America	3.6	0.3	4.9	0.1	0.0
Caribbean	74	12	104	7.7	1.8
Mexico & Central America	28	2.3	44	2.0	0.5
South America (Andean)	58	3.4	84	4.2	2.3
South America (other)	41	6.3	54	2.3	0.8
Americas	29	3.3	40	1.9	0.7

CHAPTER 2

Tuberculosis Control

This chapter summarizes the existing notifications data and data on progress towards TB control in the Americas. It is divided into five sections: Case detection and case notifications; Treatment outcomes; MDR-TB diagnosis, detection and treatment; TB/HIV collaborative activities; and Laboratory strengthening.

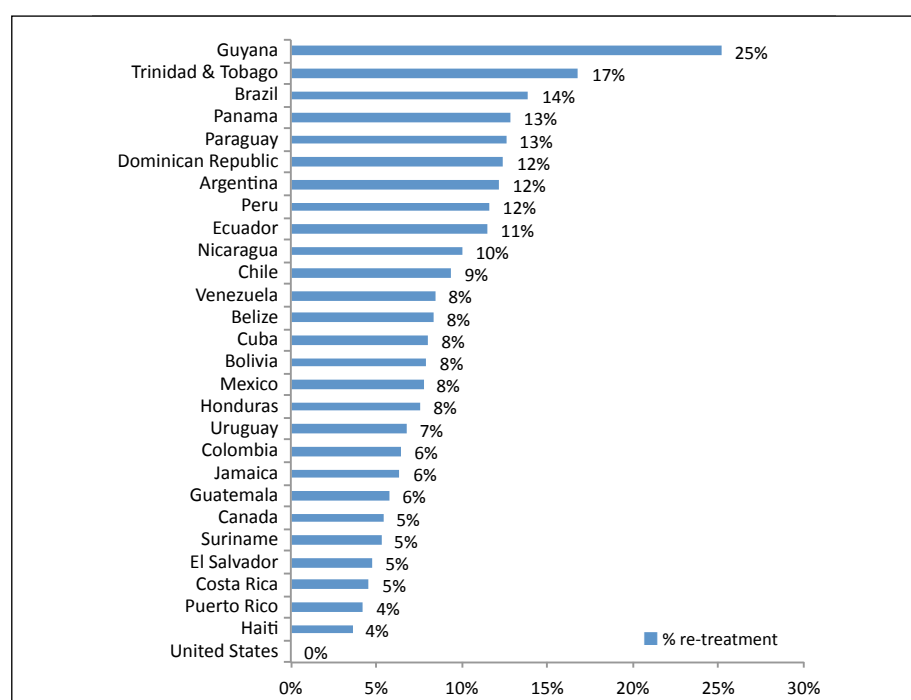
2.1 Case notifications and case detection

Case notifications are the fundamental piece of data used to evaluate the TB situation in any given setting. For this reason, WHO and PAHO place a heavy emphasis on the importance and value of accurate and complete case recording and reporting. At the same time, it is well-recognized that systems for recording and reporting can vary over time in terms of methodology and quality. For this reason, notifications may not provide a complete representation of the underlying TB epidemiology. A total of almost 219,000 new cases were notified by countries in the Americas. In this section, we describe notifications data in terms of site of disease, bacteriology, age and gender. Further to this, we present the WHO estimates of case detection rates, which are simply notifications divided by estimated incidence. However, it is important to note that there is a great deal of uncertainty around the estimates themselves and, as such, the same degree of uncertainty exists around the case detection rates.

2.1.1 Treatment history

In the region as a whole, 90% of all notifications were new cases, with 10% re-treatment cases. Of the re-treatment notifications, over 40% were classified as re-treatment following relapse. Guyana had the highest proportion of re-treatment cases, followed by Trinidad and Tobago and Brazil (Figure 12).

FIGURE 12. Proportion of all notified TB cases that are re-treatment cases, 2012*

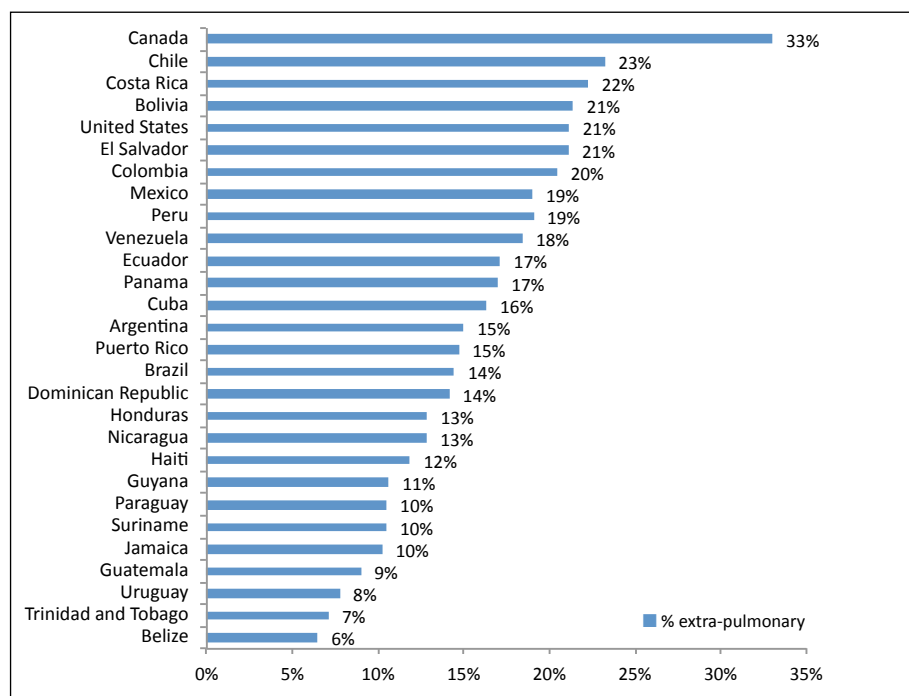


*Countries reporting fewer than 50 cases excluded

2.1.2 Site of disease

Across the Americas, 16% of notified new cases (excluding re-treatment) were extra-pulmonary (**Figure 13**). Of new cases, 83% were reported as pulmonary TB, and less than 1% of cases had no site of disease reported.

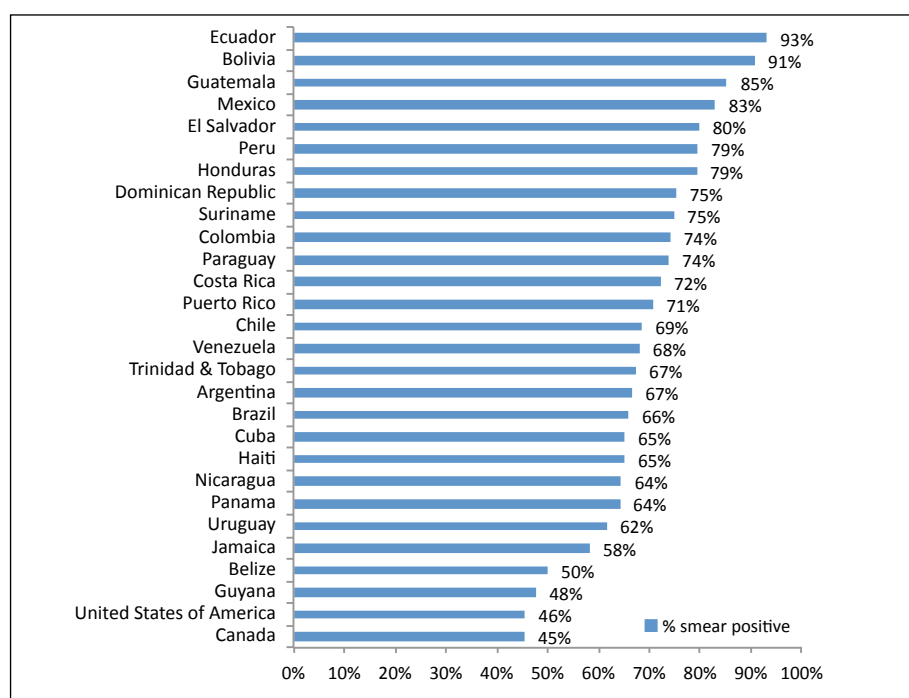
FIGURE 13. Proportion of notified new TB cases that were extra-pulmonary, 2012*



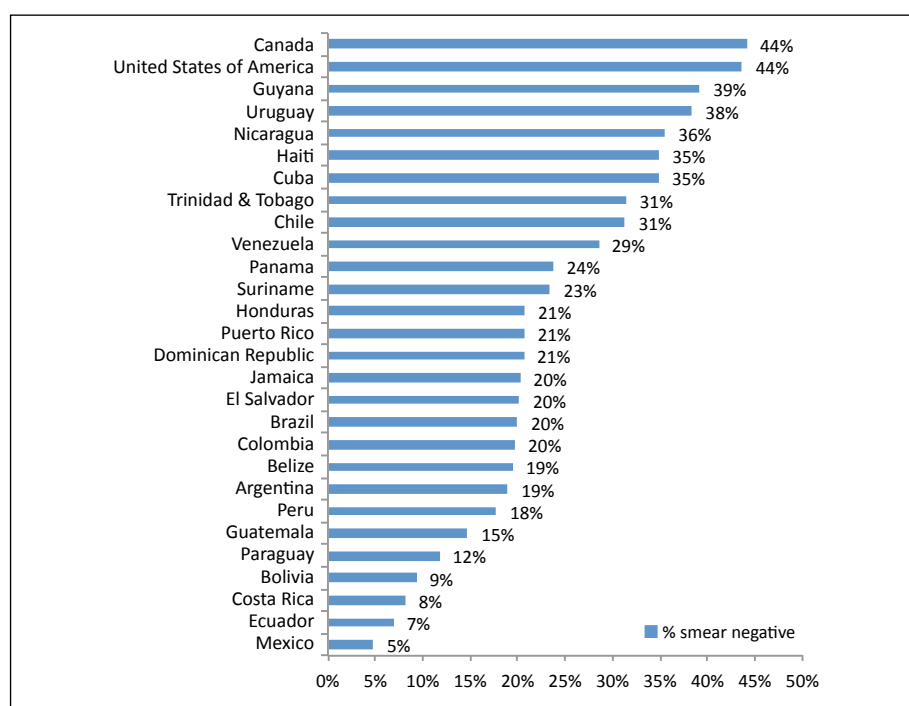
*Countries reporting fewer than 50 cases excluded

2.1.3 Bacteriology

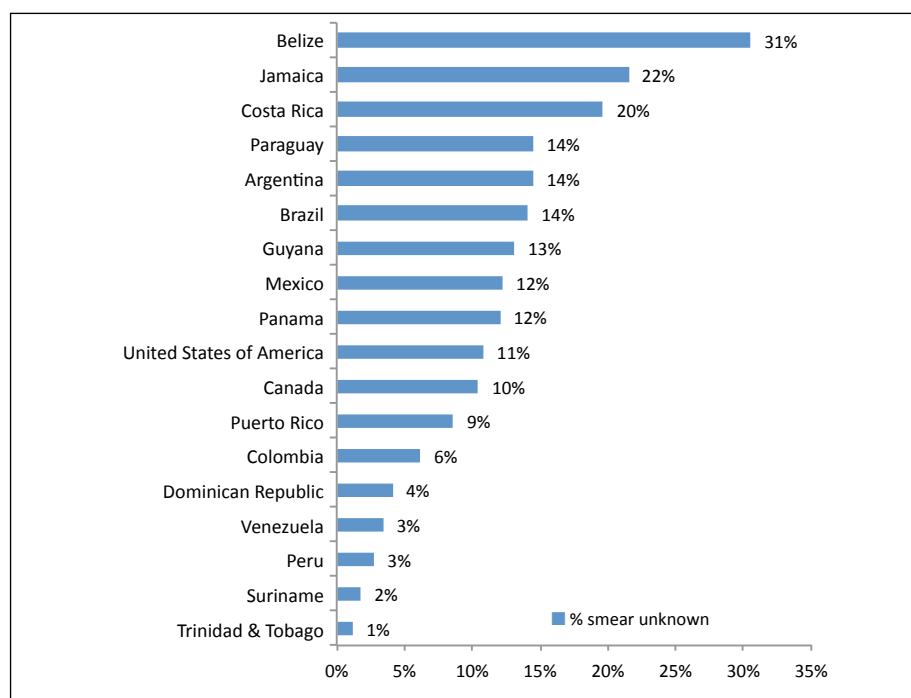
Amongst all PTB notifications in the Americas region, 71% were classified as smear-positive. Across sub-regions, this figure varied from 46% (North America) to 80% (Mexico & Central America and Andean South America). The range across countries was even greater (**Figure 14**). Canada and the United States reported the highest proportion of smear-negative patients at greater than 40% in each (**Figure 15**). This is likely due the routine use of culture testing in these countries. Belize had the highest proportion of cases with unknown smear status which may reflect weaknesses in laboratory infrastructure or recording and reporting practices (**Figure 16**).

FIGURE 14. Proportion of new PTB cases that were smear-positive, 2012*

*Countries reporting fewer than 50 cases excluded

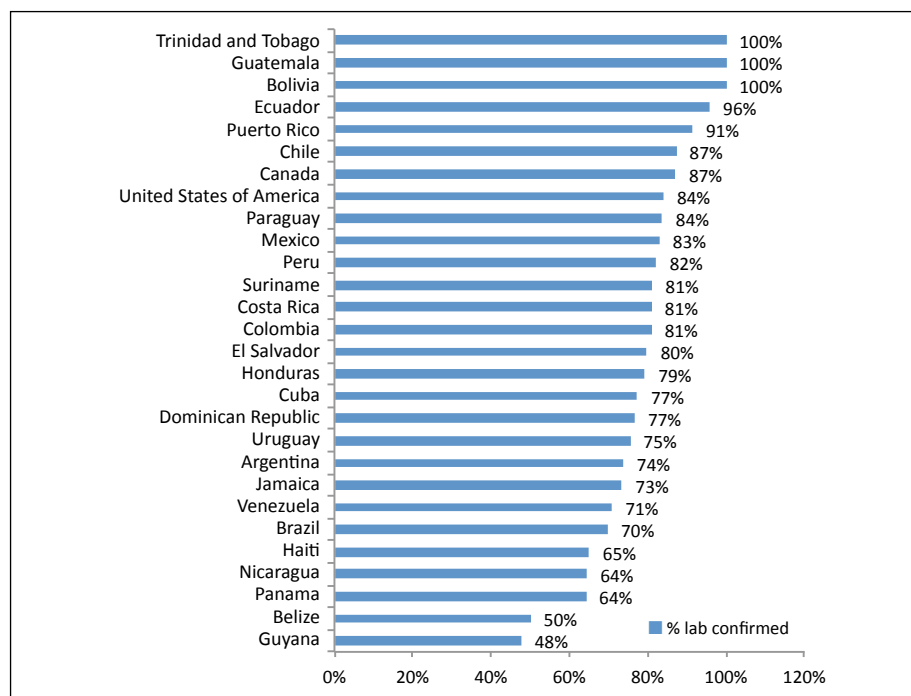
FIGURE 15. Proportion of new PTB cases that were smear-negative, 2012*

*Countries reporting fewer than 50 cases excluded

FIGURE 16. Proportion of new PTB cases with unknown smear status, 2012*

*Countries reporting fewer than 50 cases excluded

Of all new PTB cases in the Americas, 76% had laboratory-confirmed disease. The range among sub-regions was from 68% in the Caribbean to 84% in North America and Andean South America. The range across countries was even greater (**Figure 17** and **Table 8**).

FIGURE 17. Proportion of all new PTB cases with laboratory confirmation, 2012*

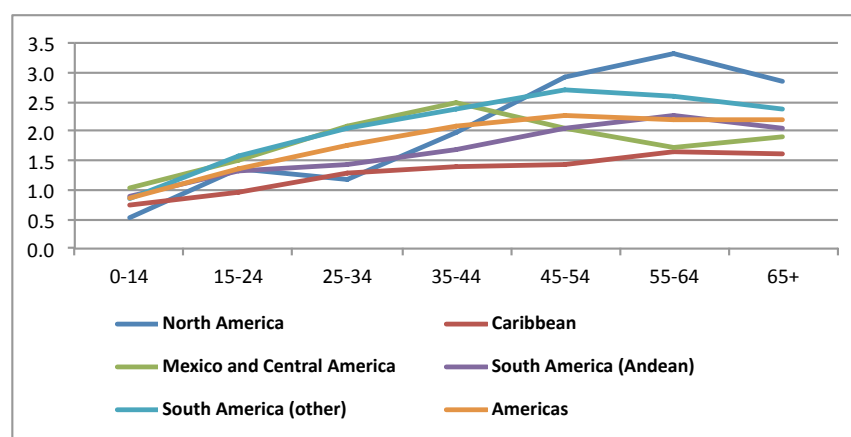
*Countries reporting fewer than 50 cases excluded

TABLE 8. Proportion of new PTB cases with lab confirmation and smear-positive by sub-region, 2012

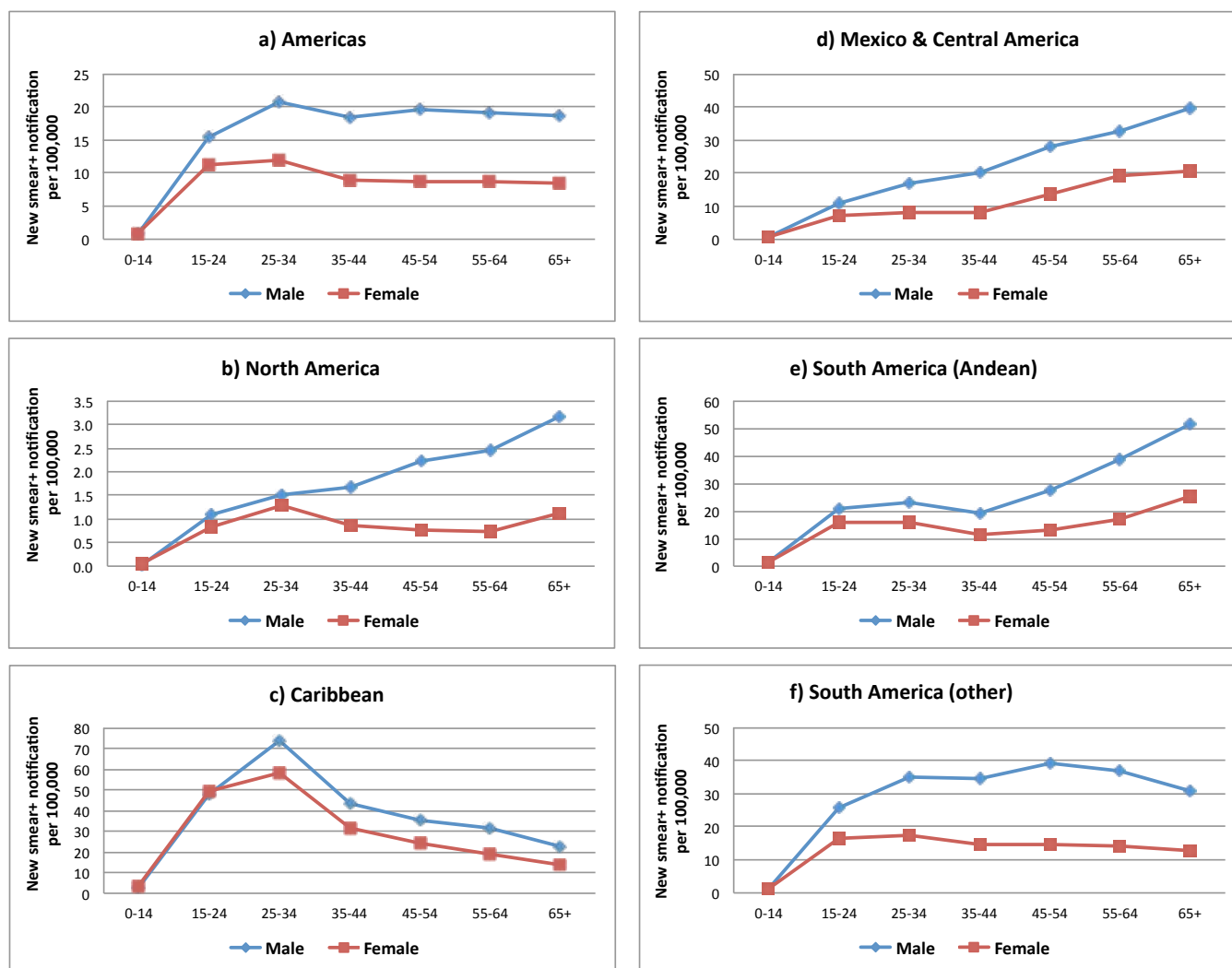
Sub-region	% lab-confirmed	% smear-positive
North America	84%	46%
Caribbean	68%	67%
Mexico & Central America	81%	80%
South America (Andean)	84%	80%
South America (other)	71%	66%
Americas	76%	71%

2.1.4 Notifications by age and gender

In the Americas, of the notifications for which gender data was available, 64% were male and 36% female. The notification rate by population in males was nearly double that of females (14 vs. 7.7 per 100,000), which led to a 1.8 male to female ratio. The male to female ratio by age appears fairly consistent when graphed across sub-regions (**Figure 18**). However, this masks the variation that exists at the country level where the range is from 0.7 (Argentina) to 4.7 (St. Lucia). Fourteen countries have an overall male to female ratio of at least 2.0, and three countries (Cuba, Guyana and Puerto Rico) have a ratio greater than 3.0.

FIGURE 18. Ratio of male to female TB notification rates by age and sub-region, 2012

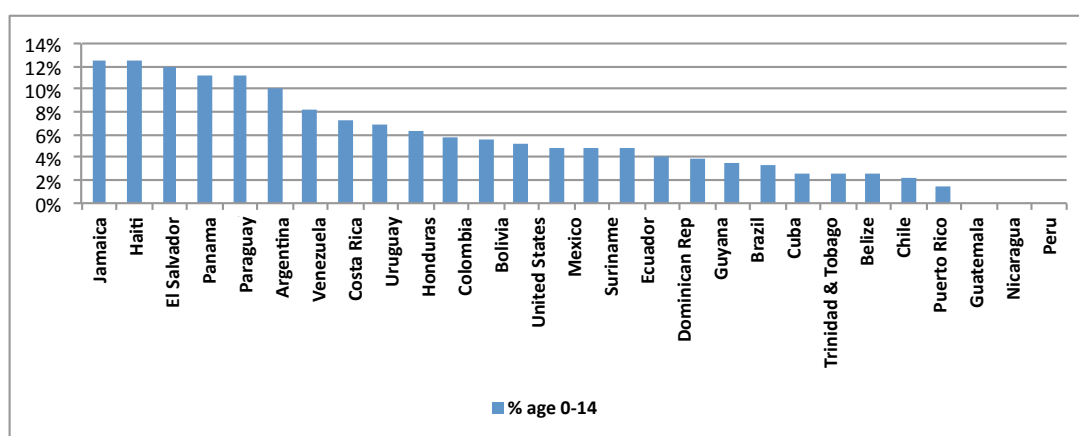
Across the sub-regions, smear-positive TB notification rates are most similar between males and females in the younger age groups, and diverge somewhat as individuals reach adulthood, with males having higher rates of disease (**Figures 19 A-F**). However, in the absence of complete or nearly complete case detection, it is difficult to disentangle the effects of gender-specific variations in TB risk factors versus variations in treatment-seeking behavior, recording and reporting of cases.

FIGURES 19 A – F. Smear-positive TB notification rates by age, sex and sub-region, 2012

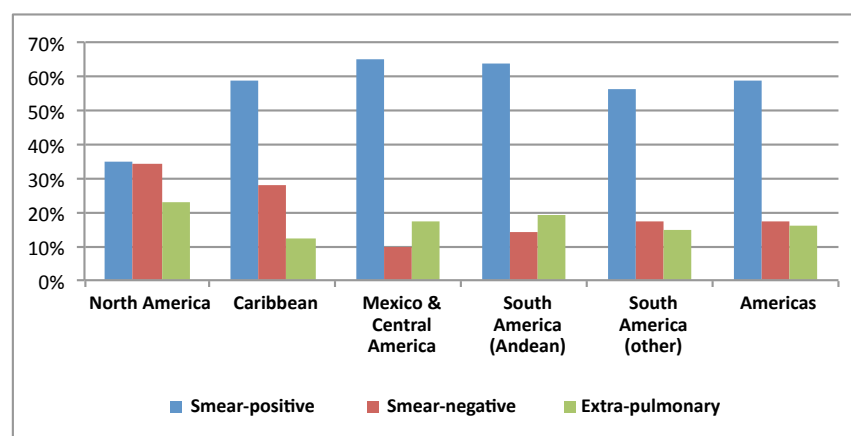
2.1.5 Childhood TB

In the region, there were approximately 9,700 notifications of new cases in the 0 – 14 age range, which represents about 5% of all new notifications. Of these, 20% were smear-positive, 57% smear-negative and 23% extra-pulmonary. The notification rates for children aged 0 – 14 ranged from 1.2 per 100,000 in North America to 31 per 100,000 in the Caribbean, with an average for the Americas region of 11 per 100,000. Again, it is important to note that these rates reflect what are likely to be significant variations in case-finding practices and recording and reporting in each country and region.

As expected, the largest proportion of childhood TB was reported as smear-negative or extra-pulmonary (**Figure 21**). However, the South America (Andean) sub-region reported approximately 30% of childhood TB cases as smear-positive.

FIGURE 20. Proportion of new notifications that were aged 0-14 by country, 2012*

*Countries reporting fewer than 50 cases excluded

FIGURE 21. Case status among notified TB cases aged 0 – 14, 2012

2.1.6 Territories

Ten territories are located within the Americas region. Their total population is approximately 611,000. In 2012, these islands reported 48 cases of TB with an average notification rate of 7.9 per 100,000. Curacao reported the highest number of cases, but Aruba had the highest incidence rate (**Table 9**).

TABLE 9. TB case notifications in territories and island nations located in the Americas, 2012

Territory	Population ('000s)	Notified TB cases	Rate per 100,000
Anguilla	14	0	0.0
Aruba	102	29	28
Bermuda	65	3	4.6
British Virgin Islands	28	0	0.0
Cayman Islands	58	6	10
Curacao	155	1	0.6
Montserrat	5	0	0.0
Saint Marteen	44	1	2.3
Turks and Caicos Islands	32	8	25
US Virgin Islands	106	0	0.0
Total	611	48	7.9

2.1.7 Case detection

The incidence figures presented in Chapter 1 represent the total number of incident cases thought to occur in 2012 in the region. However, many incident cases notified cases make up about 79% of this total, which represents the case detection rate (CDR). CDRs vary considerably at the country level due to a variety of factors (**Figure 22**). It is also important to note that, because the total incidence figures are estimates that, in some cases, are made based on an assumption of the cases missed by the surveillance system, these two figures can be circular and quite subjective. In general, it is believed that case detection has improved in the region overall in the last 10 years, and that the average for the region is currently 79% (**Table 10**).

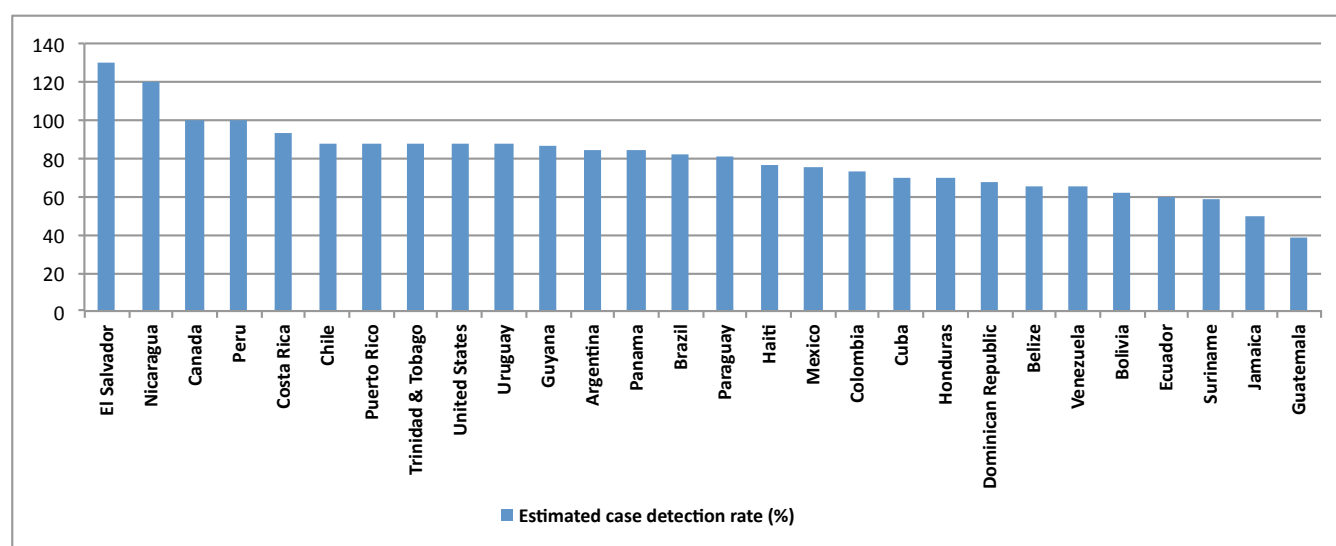
TABLE 10. Estimated case detection rate by sub-region, 2002-2012

Region	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
North America	87%	87%	87%	87%	86%	87%	86%	87%	87%	87%	89%
Caribbean	50%	57%	58%	60%	58%	59%	62%	17%	62%	65%	74%
Mexico & Central America	61%	61%	60%	68%	68%	68%	69%	68%	70%	70%	72%
South America (Andean)	71%	69%	72%	71%	74%	73%	76%	77%	77%	78%	79%
South America (other)	80%	81%	87%	83%	82%	82%	81%	77%	80%	80%	82%
AMERICAS	72%	72%	75%	75%	75%	75%	76%	70%	76%	77%	79%

Although there is a great deal of uncertainty surrounding these estimates, the overall trend is towards a narrowing of the gap between notified and estimated cases, which suggests that the efforts to improve case detection have been successful (**Figures 23 A – F**). However, point estimates for case detection are entirely driven by the estimated incidence, which is inherently uncertain, so case detection rates should be viewed with caution.

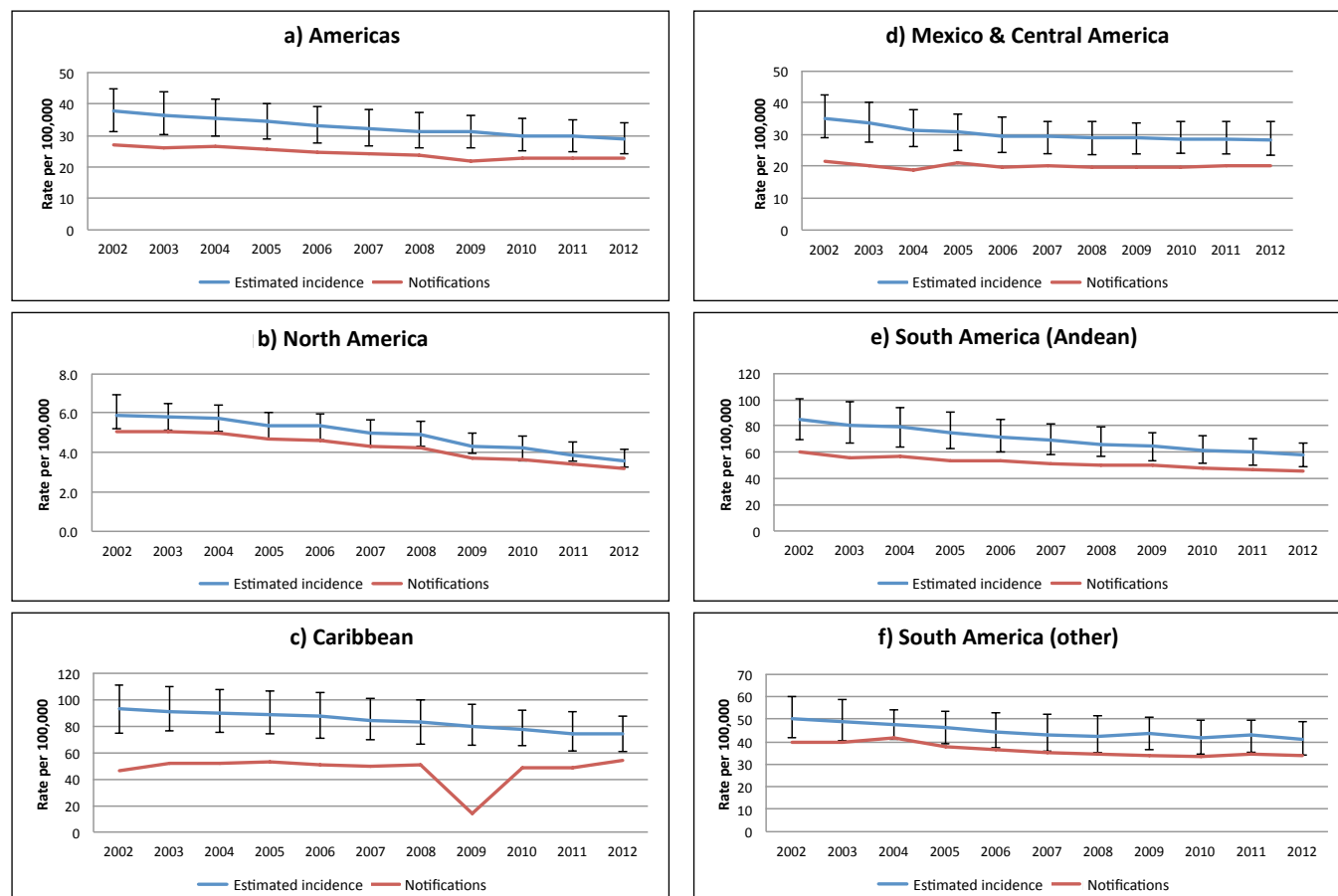
In countries where the estimated CDR is especially high, in particular those greater than 100%, this may represent a “mopping up” effect of enhanced case finding whereby prevalent cases are ultimately diagnosed, or it may indicate an under-estimation of the underlying TB incidence as the epidemiology can change due to underlying social and economic conditions and/or the epidemiology of co-morbid conditions.

FIGURE 22. Estimated case detection rate (all TB cases) in countries of the Americas, 2012*



*Countries reporting fewer than 50 cases excluded

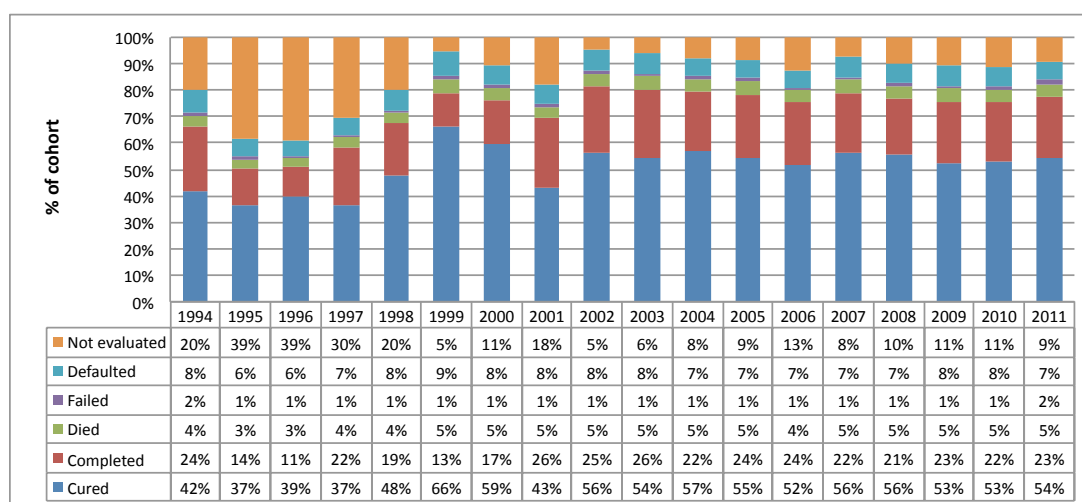
FIGURES 23 A - F. Reported vs. estimated incidence rates in the Americas, 2002 – 2012
(error bars represent uncertainty around estimated incidence)



2.2 Treatment Outcomes

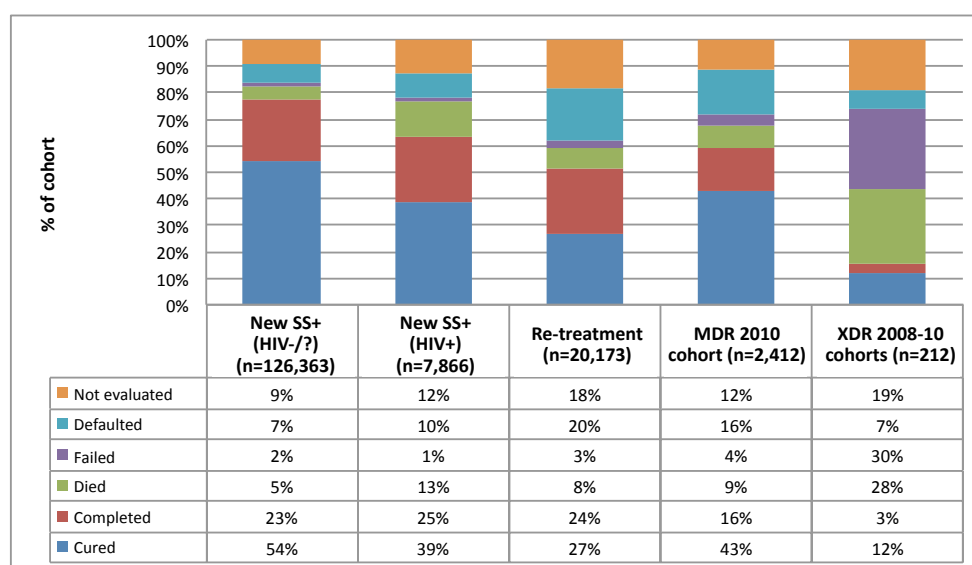
Similar to last year's cohort, the 2011 treatment cohort for the Americas consisted of approximately 126,400 incident cases of smear-positive TB. Of these, 78% were successfully treated (defined as completed treatment or cured). This is a slight improvement over the previous year's cohort, which had a 75% treatment success rate. The rates have been fairly consistent since 2002 (**Figure 24**).

FIGURE 24. Trends in new smear-positive treatment outcomes in the Americas, 1994 – 2011



As would be expected, treatment success rates were highest among HIV-negative or HIV status unknown cases (77%), though HIV-positive cases showed an improvement over the previous year (64% vs. 57% in the 2010 cohort). About 51% of re-treatment cases either completed treatment or were cured, a figure consistent with the 49% reported in the previous cohort. The cohort of MDR-TB patients fared better, with a treatment success rate of 59%, which is higher than the previous cohort's rate of 47%. However, only 15% of XDR-TB patients were successfully treated (combined 2008 – 2010 cohorts) (**Figure 25**).

FIGURE 25. Treatment outcomes across patient categories in the Americas, 2011 cohort

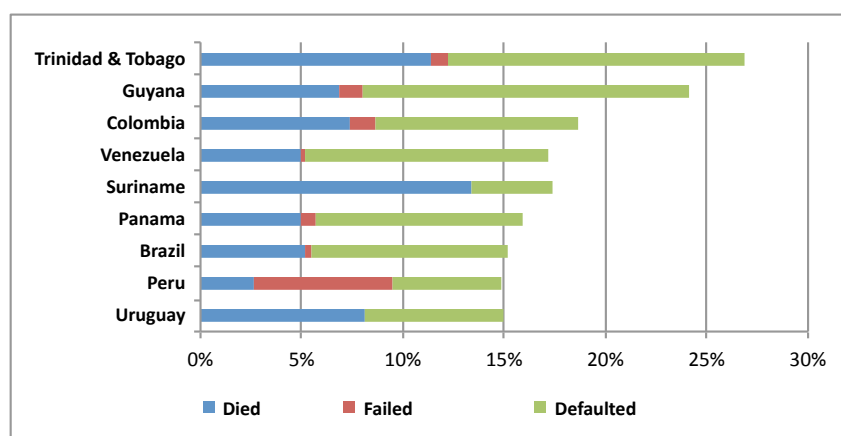


The figures above represent the averages for the entire region. Below are the sub-regional outcomes data. The highest treatment success rate was seen in Mexico and Central America at 87%, followed closely by the Caribbean at 84%. The South America (other) sub-region had the lowest treatment success rate at 72%, though North America reported a relatively high proportion of cases as not evaluated (**Table 11**).

TABLE 11. New smear-positive treatment outcomes in the Americas, 2011 cohort

Region	Cohort	Cured	Completed	Died	Failed	Defaulted	Not evaluated
North America	6,813	1%	75%	6%	0%	1%	17%
Caribbean	11,556	74%	10%	4%	1%	6%	5%
Mexico & Central America	20,469	75%	12%	5%	1%	5%	2%
South America (Andean)	35,934	72%	6%	4%	4%	7%	8%
South America (other)	51,591	36%	36%	5%	0%	9%	12%
Americas	126,363	54%	23%	5%	2%	7%	9%

Nine countries reported at least 15% of cases with unfavorable treatment outcomes (death, treatment failure or default). Of these, Trinidad and Tobago had the highest proportion of unfavorable outcomes, most of which were defaulted cases (**Figure 26**).

FIGURE 26. Unfavorable treatment outcomes in countries with $\geq 15\%$ unfavorable outcomes

2.3 MDR-TB: diagnosis, detection and treatment

The diagnosis, detection and treatment of MDR-TB are essential to the control of TB globally and in the Americas. To that end, drug-resistance surveys have been conducted in 15 countries in the Americas, though only eight of these were within the last 10 years: Argentina, Brazil (sub-national), Colombia, Costa Rica, Honduras, Mexico, Nicaragua and Paraguay. Ongoing national surveillance data have been reported from the Bahamas, Cuba, Peru, Puerto Rico, the United States and Uruguay.

In 2012, 2,967 MDR-TB cases were detected and notified in the Americas, more than 80% of which were in South America. Peru and Brazil alone accounted for 64% of all MDR notifications in the Americas. Overall 43% of the estimated MDR cases were notified during the year. Case detection was highest in South America (Andean) due to higher than expected reporting from Peru (1225 of 890), which suggests that the additional drug resistance surveys may be required in order to revise the MDR-TB estimates. The North American region reported approximately 100% of the estimated MDR cases for the year (**Table 12**).

Early detection and appropriate treatment of MDR-TB cases are crucial to controlling transmission of drug-resistant cases. Thirteen countries reported that $>95\%$ of confirmed MDR-TB cases were treated with second-line drugs: Argentina, Bahamas, Brazil, Cuba, Dominican Republic, El Salvador, Honduras, Mexico, Peru, Puerto Rico, United States, Uruguay and Venezuela.

TABLE 12. Detection and treatment of MDR-TB cases in the Americas, 2012

Country/Region	Estimated number of MDR-TB cases	MDR-TB cases detected	% detected of estimated	Confirmed MDR-TB cases treated with second-line drugs	% treated of detected
Peru	2,200	1,225	56%	1,225	100%
Brazil	1,700	684	40%	668	98%
Mexico	480	114	24%	114	100%
Haiti	390	81	21%	59	73%
Ecuador	380	223	59%	191	86%
Argentina	340	63	19%	63	100%
Dominican Republic	330	92	28%	100	109%
Colombia	310	105	34%	62	59%
Bolivia	150	117	78%	44	38%
Guatemala	140	69	49%	39	57%
Venezuela	100	21	21%	21	100%
United States	81	81	100%	80	99%
Honduras	71	6	8%	6	100%
Panama	56	11	20%	4	36%
Paraguay	55	7	13%	6	86%
Guyana	48	0	0%	0	-
Nicaragua	46	21	46%	9	43%
Chile	19	18	95%	8	44%
El Salvador	16	8	50%	8	100%
Cuba	11	8	73%	8	100%
Trinidad and Tobago	11	0	0%	0	-
Canada	7	9	122%	8	89%
Costa Rica	6	1	16%	0	0%
Suriname	3	0	0%	0	-
Jamaica	3	0	0%	0	-
Belize	3	0	0%	0	-
Uruguay	1	1	-	1	100%
Bahamas	1	1	83%	1	100%
Saint Vincent and the Grenadines	1	0	0%	0	-
Puerto Rico	1	1	-	1	100%
Saint Lucia	0	0	0%	0	-
Antigua and Barbuda	0	0	0%	0	-
Barbados	0	0	0%	0	-
Saint Kitts and Nevis	0	0	0%	0	-
Grenada	0	0	0%	0	-
Dominica	0	0	0%	0	-
North America	88	90	102%	88	98%
Caribbean	749	183	24%	169	92%
Mexico & Central America	818	230	28%	180	78%
South America (Andean)	3,140	1,691	54%	1,543	91%
South America (other)	2,167	773	36%	746	97%
Americas	6,962	2,967	43%	2,726	92%

In 2012, 11 countries reported 98 XDR-TB cases (Table 13). This represents a 26% increase in number over the 78 XDR-TB cases reported in 2011.

TABLE 13. XDR-TB cases reported in the Americas, 2012

Country	XDR cases notified
Peru	67
Brazil	16
Argentina	3
Cuba	2
Ecuador	2
Mexico	2
United States	2
Canada	1
Colombia	1
Dominican Republic	1
Venezuela	1

WHO has provided explicit policy guidance regarding drug susceptibility testing (DST) at the country level. In 2012, 21 countries reported that their national guidelines incorporated WHO's guidance regarding the use of conventional DST (solid or liquid methods). Fewer countries reported having incorporated guidance regarding liquid culture testing, line-probe assays or the Xpert MTB/RIF assay into their national TB guidelines (Table 14).

TABLE 14. Incorporation of drug susceptibility testing guidance into national guidelines, 2012
("–" indicates no data available)

Country	DST	Liquid Culture Testing	Line Probe Assay	Xpert MTB/RIF
Antigua and Barbuda	–	–	–	–
Argentina	Y	Y	N	N
Bahamas	–	–	–	–
Barbados	–	–	–	–
Belize	N	N	N	N
Bolivia	Y	Y	N	N
Brazil	Y	Y	Y	Y
Canada	–	–	–	–
Chile	Y	Y	Y	Y
Colombia	Y	N	Y	Y
Costa Rica	Y	Y	N	Y
Cuba	–	–	–	–
Dominica	–	–	–	–
Dominican Republic	Y	Y	N	N
Ecuador	Y	Y	–	Y
El Salvador	Y	Y	N	Y
Grenada	–	–	–	–
Guatemala	Y	Y	N	N
Guyana	Y	N	Y	N
Haiti	Y	Y	Y	Y
Honduras	Y	Y	N	N
Jamaica	N	N	N	N
Mexico	Y	Y	Y	Y
Nicaragua	Y	Y	–	N
Panama	Y	Y	Y	Y
Paraguay	Y	Y	N	N
Peru	Y	Y	Y	N
Puerto Rico	–	–	–	–
Saint Kitts and Nevis	–	–	–	–
Saint Lucia	–	–	–	–
Saint Vincent & the Grenadines	–	–	–	–
Suriname	N	Y	N	Y
Trinidad and Tobago	–	–	–	–
United States	–	–	–	–
Uruguay	Y	Y	Y	N
Venezuela	Y	Y	Y	N

Drug susceptibility testing (DST) is recommended for all TB cases in order to ensure selection of optimal treatment regimens. However, reported figures for DST performance are very mixed and, in some cases, difficult to interpret. For example, Brazil reported that 80% of new pulmonary TB cases subjected to DST had multi-drug resistant disease (**Table**

15). However, in the absence of qualitative data around how the 2% subset of new PTB patients were chosen for DST, it is difficult to assess how many MDR-TB cases may remain undiagnosed among the new PTB patient population.

TABLE 15. Proportion of new PTB and re-treatment cases subject to DST, 2012
 (“-” indicates no data available)

Country	% of new PTB given DST	% MDR	% of re-treatment cases given DST	% MDR
Argentina	-	-	-	-
Bolivia	22%	2%	94%	11%
Brazil	2%	80%	2%	62%
Canada	136%	1%	69%	2%
Chile	8%	10%	74%	3%
Colombia	33%	2%	51%	13%
Costa Rica	95%	0%	100%	5%
Cuba	61%	1%	85%	12%
Dominican Republic	3%	15%	35%	41%
Ecuador	13%	2%	125%	26%
El Salvador	20%	0%	74%	11%
Guatemala	1%	19%	37%	23%
Guyana	1%	0%	0%	0%
Haiti	-	-	14%	100%
Honduras	2%	0%	42%	6%
Jamaica	28%	0%	0%	0%
Mexico	0%	38%	9%	74%
Nicaragua	-	-	-	-
Panama	0%	100%	3%	100%
Paraguay	15%	0%	27%	7%
Peru	79%	4%	52%	35%
Puerto Rico	98%	0%	100%	33%
Suriname	-	-	-	-
Trinidad and Tobago	2%	0%	19%	0%
United States	103%	1%	-	-
Uruguay	88%	0%	76%	2%
Venezuela	13%	0%	26%	14%

2.4 TB/HIV collaborative activities

Due to the established link between TB and HIV infection, strengthening TB/HIV collaborative activities is an important aspect in improving case detection and outcomes for this population. Current guidance recommends that National Tuberculosis Programs (NTPs) take responsibility for HIV testing of TB patients and for providing co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) to TB patients co-infected with HIV. Where the NTP is unable to provide ART, patients should be referred to ART services. Conversely, it is recommended that national HIV/AIDS programs be responsible for intensified TB case finding among those living with HIV and for providing isoniazid preventive therapy (IPT) to HIV-positive individuals without active TB.

Among TB cases notified in the Americas in 2012, 57% were tested for HIV. Of those tested, 16% were found to be HIV-positive. The proportion tested has been steadily increasing over time, while the proportion of those testing positive has been consistent over the last six years (**Figure 27**). Testing rates were highest in North America, the Caribbean, and Mexico & Central America, all of which reported HIV-testing of more than 75% of notified TB cases. HIV-positivity rates were highest in the Caribbean and the South America (other) sub-region (**Figure 28**). These proportions varied considerably by country (**Table 16**).

FIGURE 27. Proportion of TB notifications HIV tested and proportion tested with positive result in the Americas, 2007-2012

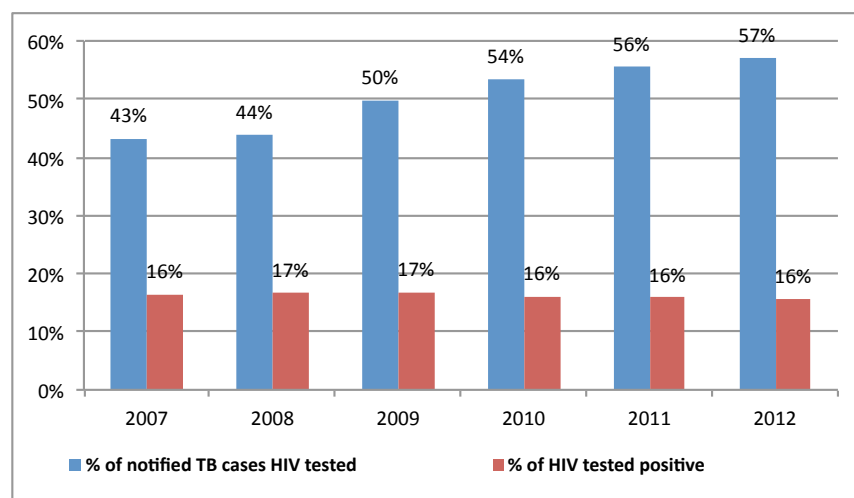
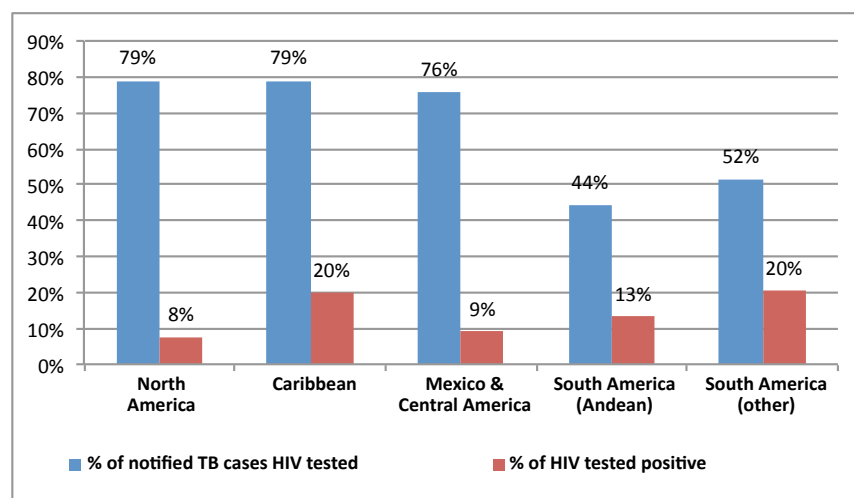


FIGURE 28. Proportion of TB notifications tested for HIV and proportion of those that tested positive by sub-region, 2012



Out of 36 countries in the region, 16 reported data on the proportion of HIV-positive TB cases who were administered CPT. The average among those countries was 64% with a range among the countries from 28 to 100%. More countries (26) reported on the proportion of HIV-positive TB cases who were given ART, and the provision of this service was in average 77% for those countries. The range at the country level was from 24 to 100%. This percentage should be higher as it is a crucial intervention for the treatment of coinfecting patients and for the prevention of deaths.

TABLE 16. HIV testing, test results and provision of TB/HIV services in the Americas, 2012
 (“-” indicates no data available)

Country	Notified TB cases	Tested for HIV	% of notified	HIV+	% of tested	% of TB/HIV cases on CPT	% of TB/HIV cases on ART
Antigua and Barbuda	4	4	100%	2	50%	50%	100%
Argentina	9,606	1,434	15%	685	48%	-	-
Bahamas	32	32	100%	8	25%	38%	63%
Barbados	4	4	100%	1	25%	0%	100%
Belize	84	68	81%	19	28%	ND	100%
Bolivia	8,484	5,049	60%	164	3%	ND	100%
Brazil	82,755	45,733	55%	9,049	20%	0%	100%
Canada	1,686	716	42%	57	8%	-	-
Chile	2,460	392	16%	140	36%	-	-
Colombia	11,829	7,791	66%	1,400	18%	-	34%
Costa Rica	480	453	94%	49	11%	-	-
Cuba	748	618	83%	54	9%	81%	94%
Dominica	8	6	75%	0	0%	-	-
Dominican Republic	4,440	2,721	61%	557	20%	69%	48%
Ecuador	5,771	4,974	86%	669	13%	-	-
El Salvador	2,063	2,036	99%	214	11%	66%	83%
Grenada	1	1	100%	0	0%	-	-
Guatemala	3,499	2,982	85%	293	10%	0%	95%
Guyana	969	914	94%	284	31%	71%	59%
Haiti	16,723	13,518	81%	2,705	20%	59%	46%
Honduras	3,046	2,312	76%	259	11%	52%	74%
Jamaica	94	65	69%	13	20%	-	-
Mexico	21,348	15,005	70%	1,233	8%	70%	24%
Nicaragua	2,934	2,117	72%	105	5%	78%	74%
Panama	1,675	1,600	96%	224	14%	89%	65%
Paraguay	2,623	1,906	73%	154	8%	60%	79%
Peru	31,705	5,836	18%	979	17%	-	87%
Puerto Rico	71	61	86%	11	18%	82%	36%
Saint Kitts and Nevis	2	2	100%	0	0%	ND	ND
Saint Lucia	11	11	100%	1	9%	100%	100%
Saint Vincent & the Grenadines	34	31	91%	9	29%	67%	67%
Suriname	133	121	91%	36	30%	-	69%
Trinidad and Tobago	321	311	97%	82	26%	28%	29%
United States	9,945	8,376	84%	625	7%	-	-
Uruguay	815	775	95%	134	17%	0%	24%
Venezuela	6,777	4,956	73%	581	12%	-	89%
Americas	233,180	132,931	57%	20,796	16%	64% *	77% *

* Average among those reporting

In terms of TB case finding and preventive measures among those living with HIV, 11 countries reported 2012 data to WHO. Of these, eight countries reported screening 4,485 HIV-positive individuals for TB. Most of these were in Haiti and Cuba. Only nine countries reported providing IPT to 18,710 HIV-positive persons, which is a small number. More than 80% of this was in Haiti (**Table 17**). This information is still incomplete reflecting limitations in HIV information systems.

TABLE 17. IPT and intensified TB case finding among HIV-positive patients in the Americas, 2012
 (“-” indicates no data available)

Country	People with HIV screened for TB	People with HIV given IPT
Antigua and Barbuda	125	1
Cuba	1,506	1,339
Grenada	8	0
Guyana	-	154
Haiti	2,105	15,283
Honduras	-	286
Nicaragua	103	230
Paraguay	412	-
Peru	-	1,416
Saint Lucia	168	1
Saint Vincent & the Grenadines	58	-
Total	4,485	18,710

2.5 Laboratory Strengthening

Strong laboratory capacity and performance are crucial to successful TB control programs across in the world. With this in mind, regional targets have been established for laboratory coverage with smear microscopy, culture and DST, with external quality assurance (EQA) activities to ensure high levels of performance are achieved and maintained. The target for smear microscopy is the availability of at least one laboratory per 50,000 to 100,000 population. For culture testing, the target is at least one laboratory per 1 million population. And the target for DST is to have at least one laboratory per 5 million population. Twenty-two countries provided at least partial data on progress towards achieving these targets.

Regarding smear microscopy, five countries reported having less than one laboratory providing smear microscopy per 100,000 population. These were Belize, Jamaica, Suriname, Uruguay and Venezuela. Twenty of the 23 countries reporting this data had at least partial EQA for smear microscopy. Twenty-three countries reported on the availability of culture, with 14 of these having met the established target. Data on EQA testing was not available for culture testing services. In terms of DST testing, 23 countries reported on the availability of this service. Of these, nine had met the target of at least one laboratory providing DST per 5 million population (**Table 18**). Furthermore, national TB reference laboratories have been established in 32 of 36 countries in the region. These are supported and followed by 4 Supranational laboratories.

TABLE 18. Laboratory capacity for smear microscopy, culture and DST in the Americas, 2012
 (“-” indicates no data available)

Country	Bacciloscropy		Culture		DST	
	# labs per 100,000 population	% labs with EQA	# labs per million population	% labs with EQA	# labs per 5 million population	% labs with EQA
Antigua and Barbuda	-	-	-	-	-	-
Argentina	1.7	96%	2.5	-	1.9	25%
Bahamas	-	-	-	-	-	-
Barbados	-	-	-	-	-	-
Belize	0.9	100%	0.0	-	0.0	-
Bolivia	5.1	81%	5.0	-	0.5	100%
Brazil	2.0	93%	1.1	-	0.9	100%
Canada	-	-	-	-	-	-
Chile	1.0	99%	2.2	-	0.3	100%
Colombia	5.6	100%	24.9	-	0.4	100%
Costa Rica	2.2	-	2.9	-	1.0	0%
Cuba	-	-	-	-	-	-
Dominica	-	-	-	-	-	-
Dominican Republic	2.0	100%	1.2	-	1.0	100%
Ecuador	2.3	92%	1.2	-	0.3	-
El Salvador	3.3	100%	1.7	-	0.8	100%
Grenada	-	-	-	-	-	-
Guatemala	1.9	99%	0.7	-	1.0	100%
Guyana	2.5	100%	1.3	-	6.3	100%
Haiti	2.5	0%	0.2	-	1.0	-
Honduras	2.1	99%	0.6	-	0.6	100%
Jamaica	0.1	100%	0.0	-	0.0	-
Mexico	1.0	90%	0.5	-	0.6	-
Nicaragua	3.2	98%	0.3	-	0.8	100%
Panama	1.4	93%	2.9	-	1.3	0%
Paraguay	1.8	95%	1.6	-	0.7	100%
Peru	4.8	96%	2.2	-	1.8	0%
Puerto Rico	-	-	-	-	-	-
Saint Kitts and Nevis	-	-	-	-	-	-
Saint Lucia	-	-	-	-	-	-
Saint Vincent and the Grenadines	-	-	-	-	-	-
Suriname	0.6	67%	1.9	-	0.0	-
Trinidad and Tobago	-	-	-	-	-	-
United States	-	-	-	-	-	-
Uruguay	0.0	0%	0.3	-	1.5	100%
Venezuela	0.8	85%	0.7	-	0.2	100%
Total	2.2	92%	3.1	-	0.9	76%

2.6 Training and Capacity Building

During 2013 PAHO's Regional TB Program conducted and co-sponsored several activities aimed at developing or strengthening capacity on TB control at Regional level and in countries. Some of these activities were conducted directly by PAHO and others in collaboration with partner organizations. They were financed with WHO and USAID funding.

Among specific training activities, the following courses and workshops were conducted during 2013:

- XXII International Course on TB Epidemiology and Control, co-sponsored with The Union - San Salvador, El Salvador – 4 to 12 March (22 participants from 8 countries).
- Workshop on Assessment and Managerial Improvement of a TB Control Program – San Salvador, El Salvador – 15 to 17 April (22 participants from El Salvador and Colombia)
- 1st Course for MDR-TB Experts in the Americas – Lima, Peru – 6 to 10 May (18 participants from 8 countries).
- X International Course on the Clinical and Operational Management of Drug Resistant Tuberculosis, co-sponsored with The Union – Santo Domingo, Dominican Republic – 3 to 7 June (20 participants from 9 countries).
- TB Infection Control Course: Environmental Control Measures for Engineers and Architects – San Salvador, El Salvador – 23 to 25 September (15 participants from El Salvador)
- Five one-week country workshops on TB drug quality control at national level – Managua, Nicaragua; Asunción, Paraguay; Guayaquil, Ecuador; Ciudad de Guatemala, Guatemala; and San Salvador, El Salvador – September (42 participants in total).

Among other activities conducted during the year that contributed to capacity building in the Region were:

- USAID AND PAHO supported Training Program in Tuberculosis – Washington DC, USA -10 month each for two residents from Colombia and Ecuador.
- Creation of the Regional Center of Excellence for the Operational Implementation of the Stop TB Strategy based in El Salvador. Two one-week rotations were conducted for new NTP managers from countries of the Region:
 - 23 to 31st May (8 participants from 7 countries)
 - 23 to 27 September (5 participants from 4 countries)
- One-week rotations of the head of the national TB laboratories of Chile and Colombia in the TB Supranational Laboratory of Argentina.

Some participants to these trainings, workshops and rotations have replicated and/or disseminated the content of these activities upon return to their countries, increasing the capacity building on TB control in the Region.

These capacity building activities are complemented by the technical assistance provided by the Regional TB Program to countries along the year during monitoring visits, in response to specific requests via e/mail or telephone and thru the dissemination of PAHO and WHO technical documents and guidelines.

CHAPTER 3

Progress towards global disease burden reduction targets

Several targets towards reduction in the burden of disease due to TB have been set at the international level, and these incorporate targets specific to each region, including the Americas. United Nations Millennium Development Goal (MDG) 6 specifically addresses HIV/AIDS, malaria and other diseases (including tuberculosis). WHO's Global Plan to Stop TB 2011-2015 established targets linked to the MDG (**Table 19**).

TABLE 19. International TB control targets

MDG 6 targets and indicators		Stop Tuberculosis targets
MDG 6: Combat HIV/AIDS, malaria and other diseases	Target 6c: To have halted and begun to reverse the incidence of malaria and other major diseases Indicator 6.9: Prevalence and death rates associated with tuberculosis Indicator 6.10: Proportion of tuberculosis cases detected and cured under DOTS	By 2015: The global burden of TB (prevalence and deaths) will be reduced by 50% relative to 1990 levels. Case detection rate (all cases) will be 90% and treatment success rate will be 90%
		By 2050: The global incidence of TB will be less than 1 case per million population per year.

3.1 Incidence

In the five-year period from 2008 to 2012, it is estimated that annual TB incidence in the Americas decreased by 9%. North America is thought to have experienced the most pronounced decline in terms of the percentage change, though the rates had been relatively low in this sub-region for many years. A more than 10% decline is estimated to have occurred in the Caribbean and the South American (Andean) region. Other sub-regions are also believed to have reduced incidence, but to a lesser degree (**Table 20**).

3.2 Prevalence

Estimates of prevalence suggest significant reductions relative to the 1990 rates across all sub-regions and in the majority of countries. The target of halving the prevalence rate has been achieved in each sub-region except the Caribbean where the estimated reduction to date is 42%. However, for the Americas as a whole, the target was achieved (**Table 20**).

3.3 Mortality

Among HIV-negative TB patients for whom data are available, the target of halving TB mortality relative to the 1990 rate has been achieved in the Americas region, with an estimated decrease of 68%. Each sub-region has also reached the targeted 50% mortality reduction, with the exception of the Caribbean. All but nine countries are thought to have reduced their TB mortality rates by at least 50% (**Table 20**).

3.4 Case detection

The 90% case detection rate target has been more elusive in the Americas region where no country or sub-region is thought to have achieved this goal (**Table 20**). Despite this, case detection efforts have improved. It is important to note that estimates of case detection rate are inherently problematic due to the uncertainty surrounding the underlying incidence denominator.

3.5 Treatment success

The target of successfully treating at least 90% of smear-positive TB cases has also not been achieved in the region as a whole or any of the sub-regions. Only three countries reached this target in their 2011 treatment cohorts, representing a small number of TB patients.

TABLE 20. Progress toward TB control targets ("—" indicates no data available)

Country	Incidence		Prevalence			Mortality				Case de-tection		Treatment success
	2008 incidence	2012 incidence	% change	Halve TB prevalence rate from 1990-2015		Halve TB mortality rate from 1990-2015		Detect 90% of TB cases	2011 TSR (%)	2012 CDR	2011 TSR (%)	
				1990 prevalence	2012 prevalence	% change	1990 mortality					2012 mortality
Antigua and Barbuda	1.3	3.9	200%	2.8	4.8	71%	3.9	1.4	-64%	87%	17%	
Argentina	30	25	-17%	102	36	-65%	4.2	1.3	-69%	84%	52%	
Bahamas	16	9.9	-38%	22	11	-50%	17	0.4	-98%	87%	70%	
Barbados	1.2	1.6	33%	2.6	1.8	-31%	0	0.7	-	87%	-	
Belize	40	40	0%	55	51	-7%	2.5	4.3	72%	65%	-	
Bolivia	144	127	-12%	419	215	-49%	40	21	-48%	62%	86%	
Brazil	47	46	-2%	140	59	-58%	7	2.5	-64%	82%	76%	
Canada	5.4	4.6	-15%	11	6.1	-45%	0.4	0.2	-55%	100%	62%	
Chile	17	16	-6%	76	21	-72%	5.8	1.2	-79%	87%	71%	
Colombia	36	33	-8%	85	48	-44%	5	1.6	-68%	73%	77%	
Costa Rica	17	11	-35%	118	12	-90%	2.5	0.8	-68%	93%	88%	
Cuba	9.1	9.3	2%	60	14	-77%	0.6	0.3	-43%	70%	88%	
Dominica	13	13	0%	-	25	-	ND	2.0	-	75%	100%	
Dominican Republic	73	62	-15%	339	98	-71%	14	4.4	-69%	67%	83%	
Ecuador	72	59	-18%	340	98	-71%	19	2.7	-86%	60%	78%	
El Salvador	32	25	-22%	95	34	-64%	4.8	1	-79%	130%	93%	
Grenada	4.2	4.1	-2%	11	6.8	-38%	0	1.0	-	23%	100%	
Guatemala	63	60	-5%	142	110	-23%	9.7	2.1	-78%	38%	86%	
Guyana	113	109	-4%	193	131	-32%	7.5	15	100%	86%	72%	
Haiti	246	213	-13%	376	296	-21%	36	25	-31%	76%	84%	
Honduras	57	54	-5%	178	82	-54%	6.4	2.9	-55%	70%	88%	
Jamaica	6.6	6.6	0%	9.5	9.5	0%	0.9	0.2	-75%	50%	47%	
Mexico	22	23	5%	145	33	-77%	7.8	1.8	-77%	75%	86%	
Nicaragua	46	38	-17%	183	55	-70%	11	3.1	-72%	120%	86%	
Panama	47	48	2%	77	64	-17%	8.1	4.9	-40%	84%	84%	
Paraguay	48	45	-6%	98	63	-36%	4.6	3	-35%	81%	78%	
Peru	119	95	-20%	554	121	-78%	34	5.1	-85%	100%	74%	
Puerto Rico	2.9	2.2	-24%	6.1	3	-51%	2	0.2	-89%	87%	73%	
Saint Kitts and Nevis	11	4.3	-61%	0.6	5.1	811%	0	2.5	-	87%	100%	
Saint Lucia	9.5	3.3	-65%	19	4.8	-75%	4	1.2	-70%	180%	57%	
Saint Vincent & the Grenadines	25	24	-4%	66	24	-64%	1	2.6	160%	110%	56%	
Suriname	52	41	-21%	129	58	-55%	6.7	2.6	-61%	58%	76%	
Trinidad and Tobago	24	24	0%	17	28	65%	2.6	2.1	-19%	87%	72%	

TABLE 20. Progress toward TB control targets (“-” indicates no data available) (continued)

Country	Incidence		Prevalence		Mortality		Case de- tection		Treatment success	
	Halt & reverse TB incidence by 2015		Halve TB prevalence rate from 1990-2015		Halve TB mortality rate from 1990- 2015		Detect 90% of TB cases		Successfully treat ≥90% of new smear+ TB cases	
	2008 incidence	2012 inci- dence	% change	2012 preva- lence	% change	1990 mortality	2012 mor- tality	% change	2012 CDR	2011 TSR (%)
United States	4.8	3.6	-25%	15	-69%	1	0.1	-86%	87%	78%
Uruguay	24	27	13%	48	-29%	2.7	1.5	-44%	87%	85%
Venezuela	33	33	0%	53	-2%	4.3	2.4	-44%	65%	80%
North America	4.9	3.6	-27%	15	-67%	1.0	0.1	-90%	89%	76%
Caribbean	83	74	-11%	179	-42%	11	7.7	-30%	74%	84%
Mexico & Central America	29	28	-3%	148	-70%	7.7	2.0	-74%	72%	87%
South America (Andean)	66	58	-12%	241	-65%	16	4.2	-74%	79%	78%
South America (other)	42	41	-2%	128	-58%	6.1	2.3	-62%	82%	72%
AMERICAS	32	29	-9%	104	-61%	6.0	1.9	-68%	79%	77%

CHAPTER 4

Financing for TB control

Adequate funding is essential for progress in TB prevention, care and control. Since 2002, WHO monitors funding for TB in all countries and findings have subsequently been published in global TB Reports. The global TB database¹ holds the financial data reported from 2002 up to 2013 for the 22 high-burden countries, and from 2006 for all other countries. It includes the NTP budget and the use of general health services up until 2013, and NTP expenditures until 2012. A comprehensive analysis of long-term trends in TB funding in low- and middle-income countries for the decade 2002–2011 was conducted by WHO in 2012. Results from these analyses were published in an article in the August 2013 issue of *The Lancet Global Health*.² Sixteen countries of the Region of the Americas were included in the analysis, 15³ priority countries and Argentina. Technical Appendix⁴ explained the methods used for data validation each year at WHO as well as details on the estimation of inpatient/outpatient costs and the imputation model used for missing values.

This year's financing report presents the funding trends 2006–2013 for TB control for the Region of the Americas for the same 15 priority countries, which together account for about 73% of the Region's TB cases. Although Peru is a priority country and their finances will impact any regional analysis it was not included because of the poor quality of financial data being reported by the NTP in the past years. Trends in total funding received until 2012 are first analysed in relation to the number of patients successfully treated in 2011 and the number of patients treated in 2012, which are the last year for which these data were reported by countries. Cost per patient successfully treated is estimated and analysed in relation to GDP per capita. Section 2 presents the committed funding from domestic sources and international sources for the Region since 2006 up to 2013; followed by the analysis of uses of the funding. Trends in funding gaps 2008–2013 are shown in Section 3.

4.1 Total funding received for treatment of drug-susceptible tuberculosis and numbers of patients

In the 15 low-income and middle-income countries included in the analyses, total funding received for treatment of drug-susceptible tuberculosis grew from US\$ 132 million in 2006 to US\$ 219 million in 2012 (**Figure 29**). The increases ranged from 1% in Guatemala, 51% in Dominican Republic, to 118% in Nicaragua. Increases in funding were also accompanied by increases in the number of patients successfully treated, from 123 thousand in 2006 to 133 thousand in 2011; around 1.1 million people were treated between 2006 and 2012.

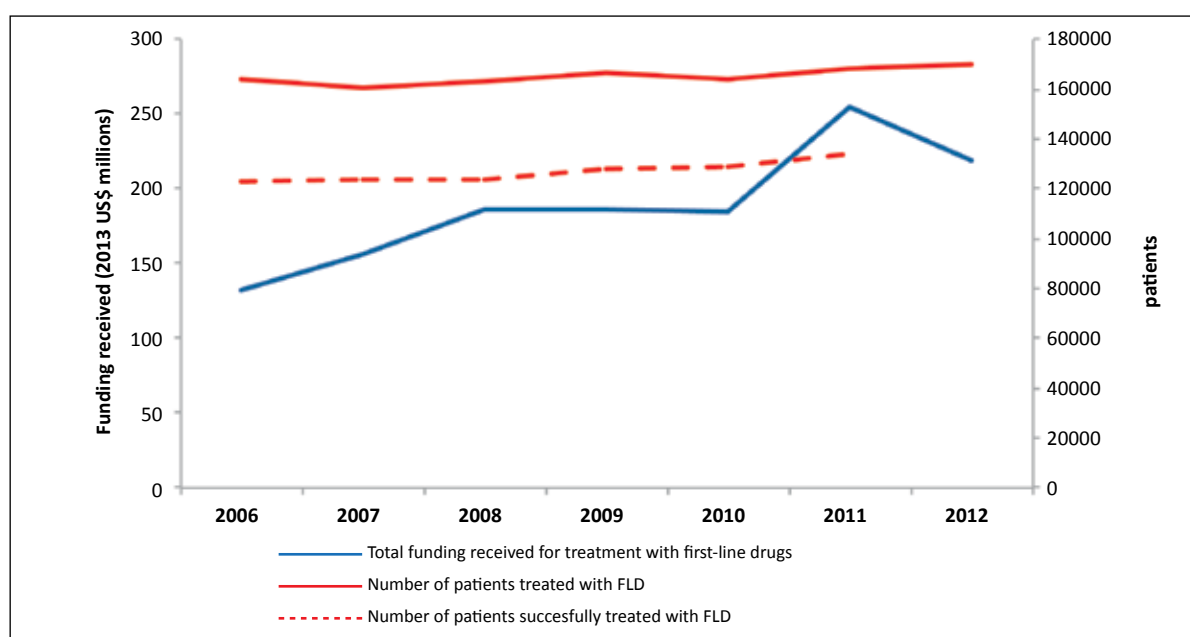
¹ www.who.int/tb/data

² Floyd K, Fitzpatrick C, Pantoja A and Raviglione M. Domestic and donor financing for tuberculosis care and control in low-income and middle-income countries: an analysis of trends, 2002–11, and requirements to meet 2015 Targets. *The Lancet Global Health*; 1: e105–15. It can be accessed at [http://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(13\)70032-9/fulltext#sec1](http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(13)70032-9/fulltext#sec1)

³ The 15 countries are: Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama and Paraguay.

⁴ It can be accessed at <http://download.thelancet.com/mmc/journals/langlo/PIIS2214109X13700329/mmc1.pdf?id=caaTtVN18ZdQw9Q0Wz-qu>

FIGURE 29. Total funding received for treatment of drug-susceptible TB and number of patients treated with first-line drugs, 15 selected countries, 2006-2013. Total funding received includes that for drug and non-drug costs channelled through the NTPs and for hospital care and outpatient visits.



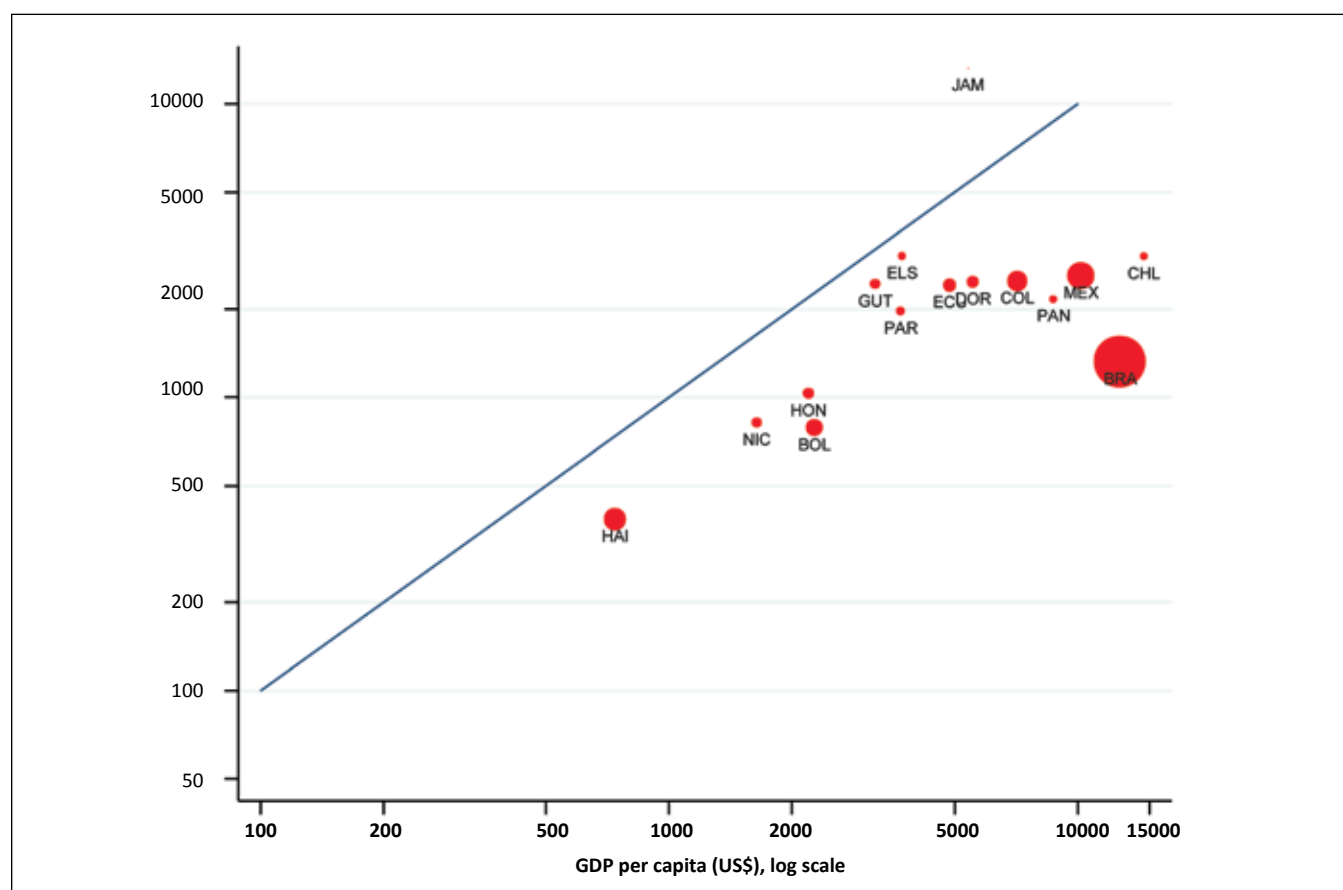
Total funding includes that for drug and non-drug costs channelled through the NTPs and for hospital care and outpatient visits

Cost per patient success fully treated was US\$ 385 for a low-income country like Haiti and between US\$ 780 – US\$ 3030 for the other countries in the analysis – which are middle income countries; Jamaica was the exception showing a high cost per patient successfully treated of above US\$ 10,000 (**Figure 30**). In all of the countries in the Region, with the exception of Jamaica, the cost per patient treated is less than GDP per capita⁵ (all values lie below the solid blue line in Figure 30); this means that treatment for tuberculosis seems to be cost-effective in each country⁶.

Although the cost per patient successfully treated tends to be higher in the higher-income countries, a further explanation for variation in costs appears to be the scale at which treatment is provided. Some of the countries with relatively low costs for their income level (for example Brazil) are countries where the total number of patients treated each year is comparatively high (as shown by the size of the circles in Figure 33). Brazil has the third highest income level in the Region after Chile and Mexico, but it also treated the largest number of patients in the Region, therefore its average cost per patient is similar to that of some low-middle income countries or strikingly even lower, for example in comparison with El Salvador. On the other hand, Jamaica reported only 51 patients successfully treated (low treatment success rate) but with a high cost of around US\$ 1 million per year, this high cost is explained mostly by the choice of care for TB patients, all are hospitalized for the initial part of treatment.

⁵ <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD>.

⁶ http://www.who.int/choice/costs/CER_thresholds/en/. GDP pc is used as the indicator to derive threshold values for cost-effectiveness of health interventions; if the cost per patient is less than GDP pc then probably the intervention is cost-effective. Our analysis does not intend to calculate cost-effectiveness ratios for tuberculosis treatment in these countries; but as a proxy we compare the cost per patient successfully treated (calculated as the funds received divided by the number of patients successfully treated, as reported by countries) with the GDP pc.

FIGURE 30. Cost per TB patient successfully treated with first-line drugs, 15 selected countries, 2011

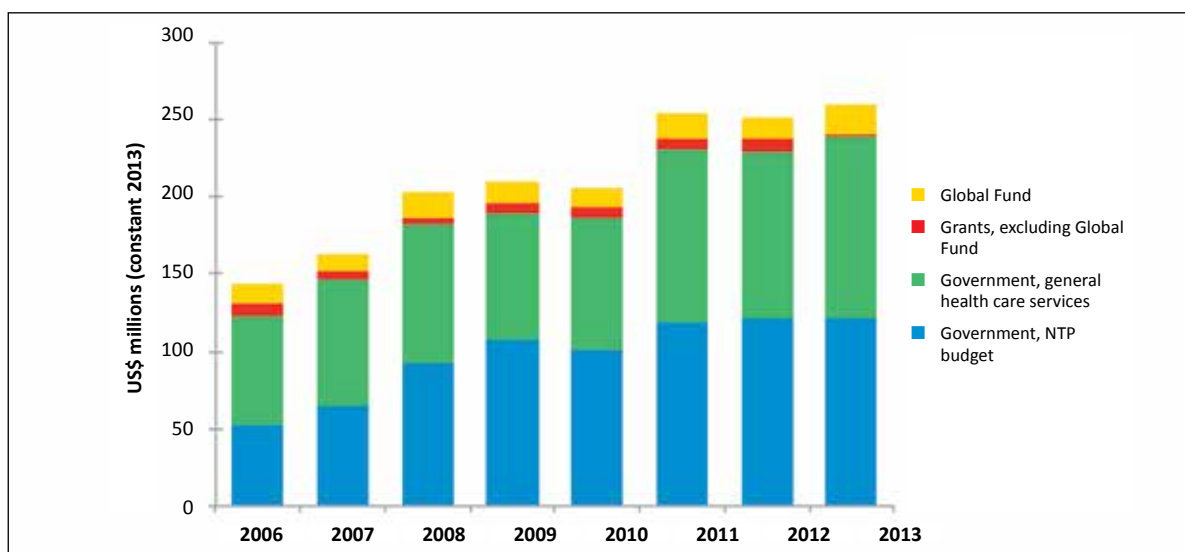
The three-digit letters for each country mean the following: BOL: Bolivia. BRA: Brazil. COL: Colombia. DOR: Dominican Republic. ECU: Ecuador. GUT: Guatemala. HON: Honduras. HAI: Haiti. JAM: Jamaica. MEX: Mexico. NIC: Nicaragua. PAN: Panama. PAR: Paraguay. ELS: El Salvador. Ecuador and Dominican Republic are very close to each other, Ecuador is the red circle on the left.

Notes:

1. The blue line marks where cost per patient treated equals GDP per capita.
2. Costs include first-line drugs, NTP staff, programme management and supervision, laboratory equipment and supplies, collaborative TB/HIV activities, PPM, PAL, ACSM, CBC, operational research, surveys, hospital stays and clinic visits.
3. Costs per patient successfully treated are case-weighted three-year mean, 2009–2011, to minimize distortions associated with non-annual expenses on items such as buildings, equipment and buffer stocks of drugs.

4.2 Total funding available from domestic and international sources for TB and its uses, 2006–2013

Domestic funding for Tuberculosis can be channelled in two ways: 1) directly via the National TB programmes, i.e. funds specifically for TB care and control from the Governments (including loans taken by the Government); and 2) through the use of general health services, this would be funds from domestic sources for inpatient and outpatient care for tuberculosis patients. In the Region of the Americas, committed domestic funding rose from US\$ 123 million in 2006 to US\$ 238 million in 2013 (**Figure 31**), both categories of domestic funding increased in all countries.

FIGURE 31. Domestic and external funding available for TB care and control, 15 selected countries, 2006-2013

Domestic funding channelled through the NTP rose from 43% (2006) to 51% (2013) of total government funding. Overall, as a share of total funding for TB, domestic funding increased from 86% in 2006 to 92% in 2013. For the period 2006 – 2012, domestic funding increased faster than GDP per capita, overall in the Region it increased in about 86%, whereas GDP per capita grew in average⁷ 79%⁸. Most of the increase in domestic funding, channeled through the NTP, was accounted for by Guatemala, Mexico and Dominican Republic. In 2013, NTPs reported budgets in the range of US\$ 1 million to US\$ 87 million (**Table 21**).

Donor funding in total remained stable at around US\$ 20 million per year (2006-2013). The Global Fund to fight AIDS, Tuberculosis and Malaria (The Global Fund) is the principal external source of funding for the Region, its contribution increased from US\$ 13 million (2006) to US\$ 19 million (2013), representing 90% of donor funding in 2013.

⁷ GDP per capita weighted by caseload for the regional average.

⁸ The increase in the GDP per capita reflects improvements in the national economy. In theory, it is expected that governments would increase their domestic funding to health when the national economy is improving. In the cases of our analysis, countries are increasing domestic financing in line with the improvements in the economies.

TABLE 21. NTP budget, available funding, costs of use of general health services and total costs for TB care and control, 15 selected countries, 2013, US\$ millions. DOTS includes the funding available for first-line drugs, NTP staff, programme management and supervision, and laboratories

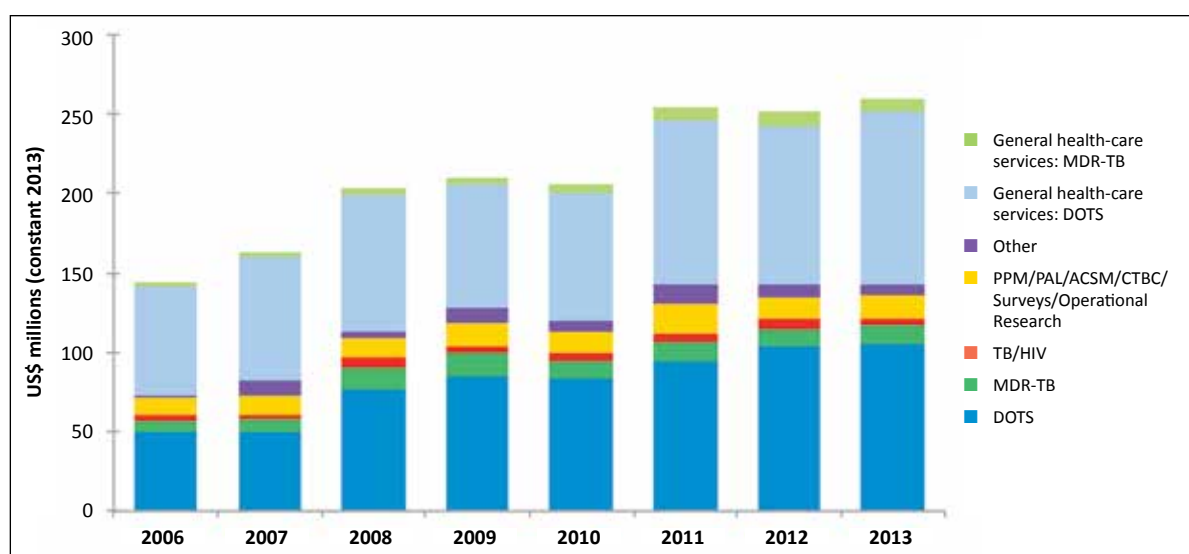
	NTP budget	Funding available			Gap	Cost of use of general health-care services ^d (estimation)	Total costs for TB care and control (b)	% of domestic funding in NTP budget	% of domestic funding in total funding available
		Government (including loans)	Grants (excluding Global Fund)	Global Fund					
Brazil	87	73	1.4	0	12	19	106	84	98
Mexico	20	20	0	0	0	35	54	100	100
Dominican Republic	15	8	0.2	3.7	3.8	4	19	49	75
Haiti	12	0	0.8	4.4	6.9	1	13	0	10
Colombia	11	7	0	2.4	2.2	24	35	59	93
Ecuador	7.3	6.5	0	0.8	0	7	14	89	94
El Salvador	7.0	3.9	0	1.4	1.7	1	8	56	79
Honduras	6.0	0.2	0	2.8	3.0	1	7	3	36
Bolivia (Plurinational State of)	4.4	1.0	0	1.6	1.8	5	9	23	78
Paraguay	4.3	1.6	0	1.2	1.5	3	8	37	81
Guatemala	0.7	0.5	0	0.1	0.1	3	4	71	97
Chile	0.6	0.6	0	0.0	0	6	7	100	100
Nicaragua	0.2	0.1	0	0.1	0	2	2	50	94
Jamaica	0.1	0.1	0	0	0	1	1	100	100
Panama	0.1	0.0	0.1	0	0	5	5	0	98
Total	176	122	2.5	19	33	116	292	69	92

Notes:

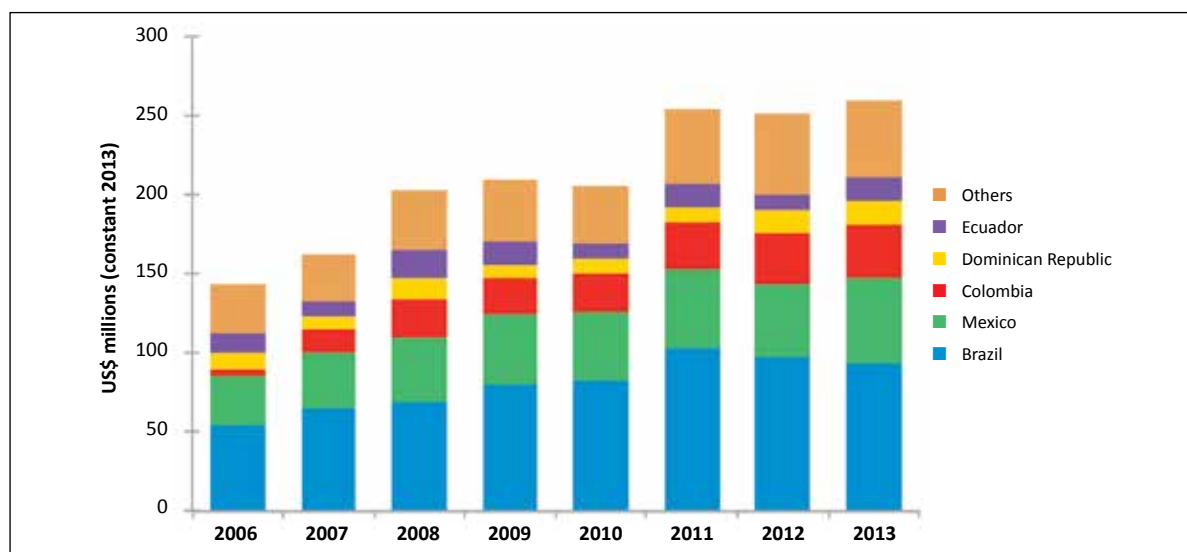
1. Data can differ from those presented in other figures as they have not been adjusted to constant 2013 US\$.
2. Calculated as the NTP budget plus the cost of use of general health-care services.

Most funding was used for diagnosis and treatment of drug-susceptible TB, this means the categories labelled DOTS and General health care services - DOTS (**Figure 32**). Category DOTS includes funds for first-line drugs, NTP staff, programme management and supervision, laboratory equipment and supplies. General health care services are the use by TB patients when hospitalized (inpatient) or when visiting the health care center for DOT and follow-up visits (outpatient). Within DOTS, first-line drugs is the single largest item funded.

Funds to treat MDR-TB patients have remain stable at around, US\$ 13 million during 2007-2013, with a pick at US\$ 14.6 million in 2012. In accordance, numbers of patients treated for MDR-TB have remained also stable at around 1500 per cohort in a year. It is worth noting, that Peru is not included in this analysis. Peru accounts for more than half of the MDR-TB cases in the Region, hence, it is likely that the available funding for MDR-TB in the Region is higher. In the past it has reported financial data of low quality that doesn't allow us to include it in the analysis. However, in 2013 data reported was better; we trust it will continue like this to be able to include it in future regional analyses.

FIGURE 32. Uses of the funding available for TB care and control, 15 selected countries, 2006-2013

DOTS includes the funding available for first-line drugs, NTP staff, programme management and supervision, and laboratories.

FIGURE 33. Available funding for TB care and control by country, 15 selected countries, 2006-2013

Brazil, Mexico, Colombia, Dominican Republic and Ecuador are the 5 countries with the largest funding available for TB. Only Brazil, Mexico and Colombia account for 70% of total funding available in 2013 within the group of 15 countries, and account also for 68% of the notified cases in 2012. Total available funding for tuberculosis has been in general stable for the last 3 year, at around US\$ 250 million, but there is a slight increase in 2013 - compared with 2012, reaching US\$ 259 million.

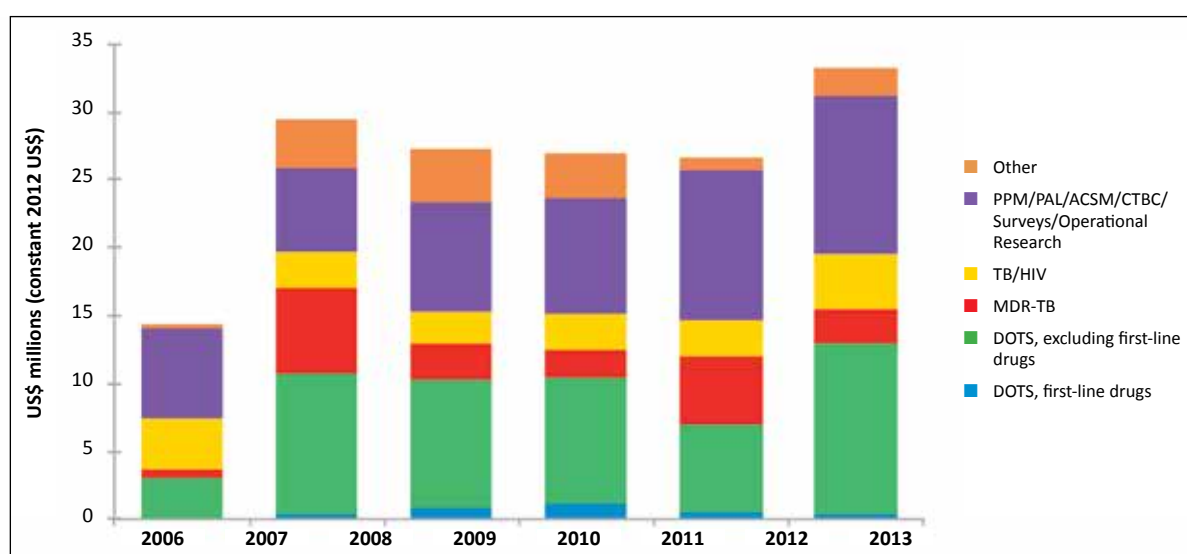
4.3 Funding gaps for treatment of tuberculosis, 2008-2013

Despite the growth in resources available for TB, countries still report funding gaps which in 2013 amount to US\$ 33 million. This is a considerable increase in reported funding gaps compared with previous years (2008–2012), where gaps were around US\$ 27 million. Brazil, Haiti and Dominican Republic are the three countries with the largest funding gaps for 2013, together amount to US\$ 23 million. A plausible reason may be that countries are developing more ambitious plans for scaling up interventions resulting in increased funding needs.

TABLE 22. Total funding gaps according to income level groups in 2013

	Funding gap, 2013 (US\$ millions)	Proportion
Low income	6.9	21%
Lower middle income	8.1	24%
Upper middle income	18.4	55%
Total	33.4	

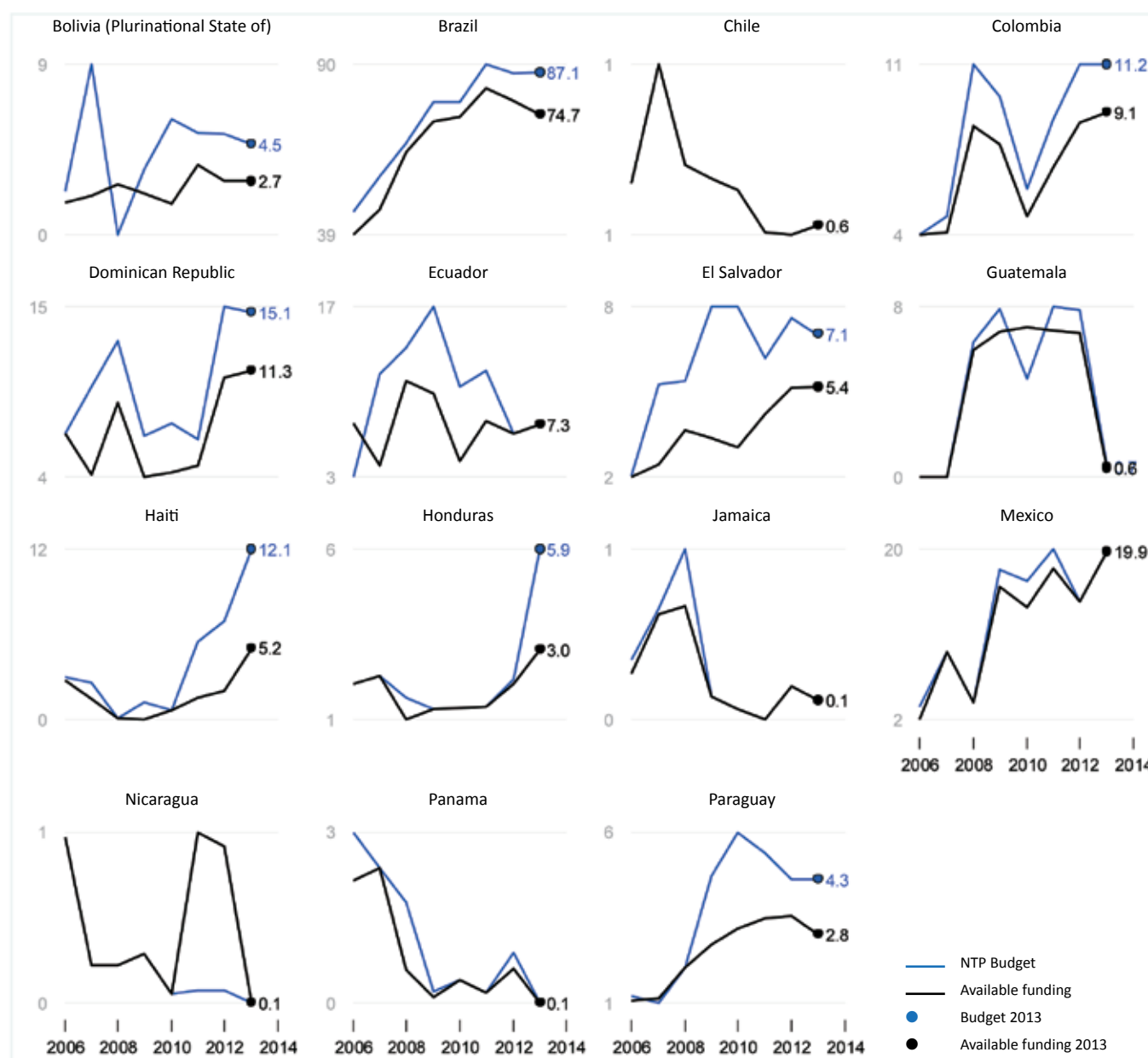
Funding gaps were reported in all income levels (**Table 22**) and for all the different interventions of TB care and control (**Figure 34**). The group of upper-middle income countries reported the largest funding gaps, however this result is highly dominated by the large funding gap of Brazil (which most of it relates to operational research and NTP staff). Excluding Brazil, the group of lower-middle income countries reports the largest funding gaps.

FIGURE 34. Funding gaps by category of expenditure, 15 selected countries, 2008-2013

DOTS –excluding first-line drugs (composed of NTP staff, Programme Management and Laboratory supplies/equipment) is the component showing the largest funding gaps in the region (**Figure 34**). Brazil, Haiti and Honduras account for most of this funding gap, mainly for programme management and NTP staff. Funding gaps for TB/HIV are increasing in 2013 compared with previous years, this increase in the gap is mainly driven by Brazil and El Salvador.

- By definition, funding gaps are the difference between the needs and the actual amount of funds mobilized, as assessed by each NTP. Trends in the total needs and resources mobilized by the NTPs in these 15 countries as a whole conceal important variations among them (**Figure 35**). Regional trends for funding for the period 2006-2013 (steadily growing – **Figure 33**) are dominated mainly by the trends in Brazil, and to a lesser extent by those in Mexico; most of the countries do not show a continuous growing trend for funding but rather sporadic highs and lows⁹. The funding estimated to be required (equivalent to budget of NTP) in Brazil has steadily increased since 2006, however in the past two years the funding gap is growing. In the other 14 countries there is a great amount of variation from year to year in the budgets and funding available reported by NTPs.

⁹ Figure 4.7 also flags out the quality of the data reported by countries. Although WHO conducts annual systematic checks with countries about the accuracy of their data, there are still questions to be answered from countries. For example, why is there a decreasing trend in Panamá?

FIGURE 35. NTPs budget and funding available, 15 selected countries, 2006-2013

The Global Plan to Stop TB 2011-2015¹⁰ set out the interventions and funding needed to reach the global targets for reductions in cases of and deaths from TB. Funding required compared with the funds that could be mobilized from domestic sources allows to estimate the gap in funding for TB for the coming years.¹¹ Funding that could be mobilized from domestic sources was estimated in two scenarios. Scenario 1 shows the funds if domestic funding increases (from a 2011 baseline) at the same rate of growth as International Monetary Fund forecasts of growth in total government expenditure. Scenario 2 has the same assumptions as scenario 1, but also assumes that countries that currently under-perform in domestic financing relative to their income level and disease burden reach the level of median performer by

¹⁰ The Global Plan to Stop TB 2011-2015. Geneva, World Health Organization 2010, (WHO/HTM/STB/2010.2)

¹¹ This estimation was conducted worldwide by the economics team at the Global TB Programme, WHO. For further information please refer to the Global TB Report 2014.

2020. This global analysis suggests that middle-income countries have the capacity to increase funding from domestic sources to face the funding gaps.

4.3.1 Active grants by the Global Fund in the Region

The Global fund is the most important donor for TB prevention and control in the Americas and are the funds currently closing the funding gaps. Up to the end of 2013, the Global Fund has disbursed US\$ 85 million to 14 countries with grants in progress in the region (**Table 23** – these 14 countries are not necessarily the same as the countries in the analysis of the chapter). The countries' lagging behind in the implementation of their grants are Honduras, Dominican Republic, Nicaragua and Ecuador (columns 8 and 9 of Table 23). These countries are almost at the end of the period of their grants, but the funds still to be disbursed are quite high. For example, Honduras has 1% of time left of the grant, but still 46% of funds have not been disbursed. There are 5 possible ratings for the performance of each grant given by the Global Fund: A1 – exceeds expectations, A2 – meets expectations, B1 – adequate, B2 - inadequate but potential demonstrated, and C – unacceptable. In general, the grant's ratings in the region are good (column 2 of Table 3), of the 17 active grants, 7 are rated top with A1, and none grant is rated as unacceptable.

TABLE 23. Active Global Fund grants and country performance in the Region of the Americas, as of end 2013.
Cut-off-date: 23 December 2014.

General Information		Latest Rating	Key grant data		Finance data - Looking backwards		Finance data - Looking forward		Time left until end of grant (%)
Country			Signed Amount (Cumulative to date) ¹	Disbursed Amount (Cumulative to date) ²	Funds that could theoretically have been disbursed at cut-off date 4 (= time elapsed x signed amount)	Difference between Funds that could theoretically have been disbursed at cut-off date and Disbursed	Funds remaining (=Signed - Disbursed amount)	Proportion of funds remaining of signed amount (%)	
Honduras		B1	\$9,100,813	\$4,955,186	\$9,019,917	\$4,064,731	\$4,145,627	46%	1%
Dominican Republic		A2	\$10,630,997	\$6,367,976	\$7,494,385	\$1,126,410	\$4,263,022	40%	30%
Nicaragua		A1	\$10,655,995	\$6,282,930	\$7,215,871	\$932,941	\$4,373,065	41%	32%
Ecuador - grant 1		A2	\$3,304,845	\$1,551,271	\$1,968,219	\$416,948	\$1,753,574	53%	40%
grant 2		A1	\$5,434,603	\$3,899,961	\$3,236,608	\$(663,353)	\$1,534,642	28%	40%
			\$8,739,448	\$5,451,232	\$5,204,827	\$(274,229)	\$3,288,216		
Guyana		B2	\$3,282,857	\$1,875,285	\$2,120,445	\$245,159	\$1,407,572	43%	35%
Cuba		A1	\$7,524,156	\$7,496,051	\$7,490,715	\$(5,336)	\$28,105	0%	0%
Colombia - grant 1		B1	\$2,133,697	\$1,913,785	\$1,875,546	\$(38,239)	\$219,912	10%	12%
grant 2		A1	\$2,424,207	\$2,423,384	\$2,130,908	\$(292,476)	\$823	0%	12%
			\$4,557,904	\$4,337,169	\$4,006,454	\$(330,715)	\$220,735		
Guatemala		B1	\$3,580,104	\$3,147,180	\$3,098,337	\$(48,843)	\$432,924	12%	13%
Bolivia (Plurinational State)		B1	\$3,653,921	\$1,525,872	\$1,300,486	\$(225,386)	\$2,128,049	58%	64%
Suriname		A1	\$3,542,572	\$2,655,637	\$2,227,884	\$(427,753)	\$886,935	25%	37%
Peru - grant 1		A1	\$8,533,834	\$7,216,527	\$6,646,908	\$(569,619)	\$1,317,307	15%	22%
grant 2		B1	\$11,137,209	\$9,554,856	\$8,674,648	\$(880,207)	\$1,582,353	14%	22%
			\$19,671,043	\$16,771,383	\$15,321,557	\$(1,449,826)	\$2,899,660		
El Salvador		A1	\$4,574,369	\$4,135,029	\$3,183,496	\$(951,533)	\$439,340	10%	30%
Paraguay		A2	\$8,994,050	\$7,004,341	\$5,687,147	\$(1,317,195)	\$1,989,709	22%	37%
Haiti		A2	\$21,661,161	\$13,652,436	\$11,817,367	\$(1,835,069)	\$8,008,725	37%	45%
Grand Total, sum or average			\$120,169,391	\$85,657,707	\$85,188,887	\$(468,820)	\$34,511,684		

Source: The Global Fund Database

Notes:

1. Information source: Grant Agreement (i.e. the legally binding document, signed between the Global Fund, the Principal Recipient and the Country Coordinating Mechanism).

2. Total funds disbursed since the grant start date (as specified in the Grant Agreement) and the cut-off date.

Data shown in this Table are as of end of 2013, it is possible that in the first 3 months of 2014 data have changed.

Conclusions

The main conclusions on TB epidemiology, control and financing in the Americas in this report are:

1. The 2015 global targets on TB incidence, prevalence and mortality have been reached in the Americas and continue to decline as a whole. Nonetheless, some countries have not yet reached these targets as well as areas within several countries. Although 62% of the WHO estimated TB incidence in the Region is concentrated in four countries: Brazil, Peru, Mexico and Haiti, it is necessary to tailor control efforts and aim towards not only these countries but also areas within other countries with a high burden of TB.
2. Progress towards the 2015 target for treatment success among sputum smear-positive TB cases in the Region is still limited. It continues to be low in some countries, where the treatment outcome of a high proportion of TB cases is either not evaluated or not reported. Ensuring treatment adherence and strengthening of direct observed treatment might serve to increase treatment success in countries with a high proportion of unfavorable treatment outcomes. Adequate recording and reporting of treatment outcomes should be ensured where a high proportion of treatment outcomes are not evaluated. Particular attention is needed to improve treatment outcomes among HIV-positive, re-treatment and MDR-/XDR-TB patients.
3. Laboratory capacity, especially for culture and DST, and external quality assurance continues to be inadequate in some countries with a high burden of TB. This limits the proportion of TB cases confirmed by laboratory methods. Increasing the number of laboratories and strengthening their capacity and performance is clearly needed in the Americas. This should include further implementation and expansion of new diagnostic tests, like Xpert MTB-Rif.
4. The persistent deficiencies in laboratory capacity with low DST coverage are reflected in the limited MDR-TB case detection in the Americas. Furthermore, the total number of notified MDR-TB cases decreased by almost 600 in 2012 with respect to the previous year due to limitations on notification in key high burden countries and the increase in WHO's MDR-TB estimates for that year. The MDR-TB case detection was only 46%. Roll-out of DST on the basis of new and conventional methods is needed along with improved recording and reporting. The target of testing 100% of re-treatment TB cases and at least 20% of new TB cases should continue to be top-priority in all countries, especially in those with an expected high-burden of MDR-TB. Drug-resistance (DR) surveillance should further be strengthened by conducting DR surveys in countries without reliable DR data and by moving towards continuous DR surveillance in the remaining countries, where possible.
5. Stronger efforts are needed to guarantee HIV testing in TB patients in most countries in the Region. CPT and ART should be made available for all TB patients living with HIV. By increasing test coverage and provision of CPT and ART, mortality among TB cases can be reduced and treatment outcomes in HIV coinfecting persons improved. Better-quality recording and reporting is needed in the Americas to allow for follow up on the implementation of the TB/HIV collaborative activities, especially on intensified TB case finding among people with HIV and provision of IPT. Increased action towards tackling the coinfection is needed, particularly in South America
6. Funding received for treatment of drug-susceptible tuberculosis reached US\$ 219 million in 2012. Increases in funding were accompanied with increases in number of patients successfully treated. Cost per patient successfully treated is less than GDP per capita in 14 countries (out of the 15 in the analysis).
7. Countries have mobilised resources mostly domestically, reaching 92% in 2013 of total available funding. Donor funding in total remained stable at around US\$ 20 million per year, mostly from Global Fund (2006-2013). Total available funding for TB reached US\$ 259 million in 2013, increasing from US\$ 251 million in 2012. Funding was mostly used for diagnosis and treatment of drug-susceptible TB (in the 15 countries included in the analysis).
8. Funding gaps amount to US\$ 33 million in 2013. Reported NTP funding gaps are mainly for programme management and NTP staff. According to Global Plan analysis, middle income countries have the capacity to increase domestic funding to face these funding gaps.



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