Tuberculosis in the Americas

Regional Report 2012

Epidemiology, Control and Financing

Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

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Abbreviations

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
CDR	Case detection rate
CPT	Co-trimoxazole preventive therapy
DTBC	Community TB Care
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
EPTB	Extra-pulmonary TB
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 programme or equivalent
PTB	Pulmonary TB
TB	Tuberculosis
TSR	Treatment Success Rate
UNAIDS	Joint United Nations Program on HIV/AIDS
WHO	World Health Organization
XDR-TB	Extensively drug-resistant TB

Executive Summary

This report is intended to provide a comprehensive and up-to-date assessment of the current burden of tuberculosis (TB) and the situation of TB control in the Americas. It is based on TB surveillance and control data for the year 2011 reported to WHO in 2012. The main findings of the report are as follows:

1. In 2011, an estimated 268,400 incident TB cases occurred in the Americas, 5,100 less than in 2010. Around two-thirds (67%) of all incident TB cases occurred in South America (Andean subregion: 29%; other countries: 38%), 17% occurred in Mexico and Central America, 11% in the Caribbean and 5.1% in North America. Brazil currently ranks 17th worldwide and 1st in the Americas by total numbers of incident TB cases (83,000). 60% of all incident TB cases in the Americas occurred in Brazil, Peru, Mexico and Haiti alone (**Chapter 1, section 1.1**).

2. The rate of incident TB cases in the Region was 28 per 100,000 population (high/low estimate: 26-29). It was highest in the Caribbean (75) and lowest in North America (3.9). At country level, Haiti is the country with the highest incidence rate (222) followed by Bolivia (131), Guyana (111) and Peru (101). Incidence has been constantly declining in the Americas since 1990 and for several years in all subregions (and most countries) with the exception of Mexico and Central America subregion, where it reached a plateau in recent years mainly due to constant or slightly increasing numbers of incident TB cases in Mexico (**Chapter 1, section 1.1**).

3. In 2011, there were an estimated 337,000 prevalent TB cases in the Americas, and an estimated 20,700 TB deaths occurred among HIV-negative cases (**Chapter 1, sections 1.2 and 1.3**).

4. There were an estimated 6,000 MDR-TB cases among notified Pulmonary TB (PTB) cases in 2011 in the Americas. The estimated proportion of MDR-TB was 2.1% (1.4%-3.0%) among new cases and 11% (8.0%-15%) among re-treatment cases. Seven countries (Peru, Brazil, Mexico, Ecuador, Argentina, Dominican Republic and Haiti) accounted for more than 80% of all estimated MDR-TB cases in the Region (**Chapter 1, section 1.4**).

5. There were an estimated 38,100 HIV-positive incident TB cases in the Americas, 14% of all incident TB cases. Two-thirds of all HIV-positive incident TB cases occurred in Brazil, Mexico and Haiti alone. The estimated prevalence of HIV co-infection was highest in the Caribbean (21% of all incident TB cases). At country level, HIV prevalence varied between 1.0% and 37% of estimated incident TB cases. It was higher than 25% in four countries: Belize (37%), Trinidad and Tobago (33%), Suriname (33%) and Dominican Republic (26%) (**Chapter 1, section 1.5**).

6. In 2011, around 233,200 TB cases were notified in the Americas of whom 208,200 (89%) were new cases, 172,600 (83%) new pulmonary TB (PTB) cases and 34,200 (16%) extrapulmonary TB cases. Of all new PTB cases, 78% were confirmed by any laboratory method and 70% by sputum smear microscopy alone. At country-level, the proportion of new PTB cases with bacteriological confirmation by any laboratory method varied between 53% and 98%. (**Chapter 2, section 2.1**).

7. Around 9,800 TB cases notified in the Americas in 2011 were children (age 0-14 years), 5.1% of all new TB cases notified and equivalent to 4.2 childhood TB cases per 100,000 children. One-fourth of all childhood TB cases were new sputum smear-positive TB cases (**Chapter 2, section 2.1.5**).

8. The case detection rate (all forms of TB) has been steadily increasing in the Americas over the past years, i.e. from 70% in 2001 to 84% in 2011 (**Chapter 2, section 2.2**).

9. Treatment success is still below the targets in the Americas. Only 75% of all new smear-positive TB cases treated in the 2010 cohort were successfully treated (cured or treatment completed). The treatment success rate was significantly lower among new smear-positive TB cases who were HIV-positive (57%), re-treatment cases (49%), MDR-TB cases (47%; 2009 cohort) and XDR-TB cases (12%; 2008 and 2009 cohort). At country level, the proportion of new smear-positive TB cases with unfavorable treatment outcomes (i.e. death, failure or default) was highest in Guyana (25%), Trinidad and Tobago (23%) and Panama (20%) (**Chapter 2, section 2.3**).

10. A total of 23 countries reported data on laboratory capacity and external quality assurance (EQA) of laboratories in 2011, two more than in 2010. Of these, 17 had at least one laboratory providing smear microscopy available per 100,000 population. Laboratory capacity for culture and drug-susceptibility testing (DST) was below regional targets in 9 and 15 of the 23 countries, respectively. Laboratory inclusion in EQA varied considerably across the countries. New diagnostic tools including the WHO endorsed Line Probe Assay and Xpert MTB/RIF for diagnosis of drug-resistant TB are being rolled-out in the Americas. By the end of 2011, the Line Probe Assay was available in laboratories in Bolivia (private sector only), Chile, Colombia, Ecuador, Guyana, Mexico and Uruguay. The Xpert MTB/RIF was at least partially implemented in Colombia, Costa Rica, Ecuador, El Salvador, Mexico and Uruguay. (**Chapter 2, section 2.4**).

11. Detection and treatment of MDR-TB remains one of the top priorities for TB control in the Americas. In 2011, DST results were available for 11% of notified new and 19% of re-treatment cases among the 29 countries with available data. There is considerable variation in DST coverage among new and re-treatment cases across the countries. A total of 3,474 MDR-TB cases were detected via DST in the Americas in 2011, representing 58% of MDR-TB cases estimated among notified cases. MDR-TB case detection was very high in North America (112% of estimated MDR-TB cases) and high in the Andean countries of South America (77%). It was moderate in the other countries of South America (45%) and low in the Caribbean (33%) and in Mexico and Central America (26%). During 2011, a total of 3,086 MDR-TB cases were started on second-line treatment, 89% of all detected MDR-TB cases in the same year (**Chapter 2, section 2.5**).

12. In 2011, 54% of all notified TB cases were tested for HIV or knew their HIV status. The proportion varied across the countries between 10% and 100%. Around 20,900 TB cases were HIV-positive, 1,200 more than last year (+6.6%). The proportion HIV-positive among all tested TB cases was 17%. It was highest in the South America – Other subregion and the Caribbean (each 20%). Among countries reporting data, the overall proportion of HIV-positive TB cases who were provided with co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) was 43% and 64%, respectively. There are currently insufficient data to monitor the provision of isoniazid preventive therapy (IPT) and intensified TB case finding among individuals living with HIV in the Americas (**Chapter 2, section 2.6**).

13. Overall, the Region is making good progress towards the global targets for TB control. By 2011, the Region as a whole and all subregions, except for the Caribbean, have met the targets for incidence prevalence and mortality. Limited progress is made in the Caribbean in terms of TB-related mortality. Considerable progress was made towards the target for case detection in the Americas (2011: 84% vs. 2015 target: ≥ 90%). Only limited progress was made for treatment success of new smear-positive TB cases (2010: 75% vs. 2015 target: ≥90%). The report provides a detailed assessment of the current progress towards the global targets for TB control at regional, subregional and country level (**Chapter 3**).

14. The funding available for TB control in 15 selected countries with complete financial information, representing 72% of the Regional TB burden, is expected to reach US$ 246 million in 2013. 90% of the expected funding is from national governments and the largest source of donor funding continues to be the Global Fund. Despite these available sources funding gaps continue to be reported by the NTPs, reaching US$ 38 million for 2013. The estimated cost per patient treated in the 15 selected countries is less than the GDP per capita. (**Chapter 4**).

Introduction

This report was produced and published by the Regional Tuberculosis (TB) Program of the Pan American Health Organization (PAHO). It aims to provide a most recent, comprehensive and up-to-date assessment of the burden of tuberculosis (TB) and the situation of TB control in the Americas

The analysis for this report is based on TB surveillance and control data submitted by the countries of the Americas to PAHO and WHO during the 2012 TB data collection for the Global TB Control Report. The financial analysis was conducted on the basis of data reported by 15 countries since 2006. These countries represent 85% of the TB burden in the Region (by numbers of incident cases).

Data, figures and trends in this report are presented for the Americas, as a whole, five subregions and 35 countries. Subregions were defined on the basis of standard United Nations subregions. For reasons of comparability, South America was divided into two subregions, the Andean countries of South America ("South America – Andean") and the other countries of South America ("South America – Other"). A total of 35 countries were considered for this report. Non-independent territories and island nations reporting TB data to the WHO were considered in a subsection (2.1.6). An overview of the Americas and the five subregions used in this report is shown in **Figure 1** and **Table 1**.

Figure 1. Region of the Americas: Five subregions.

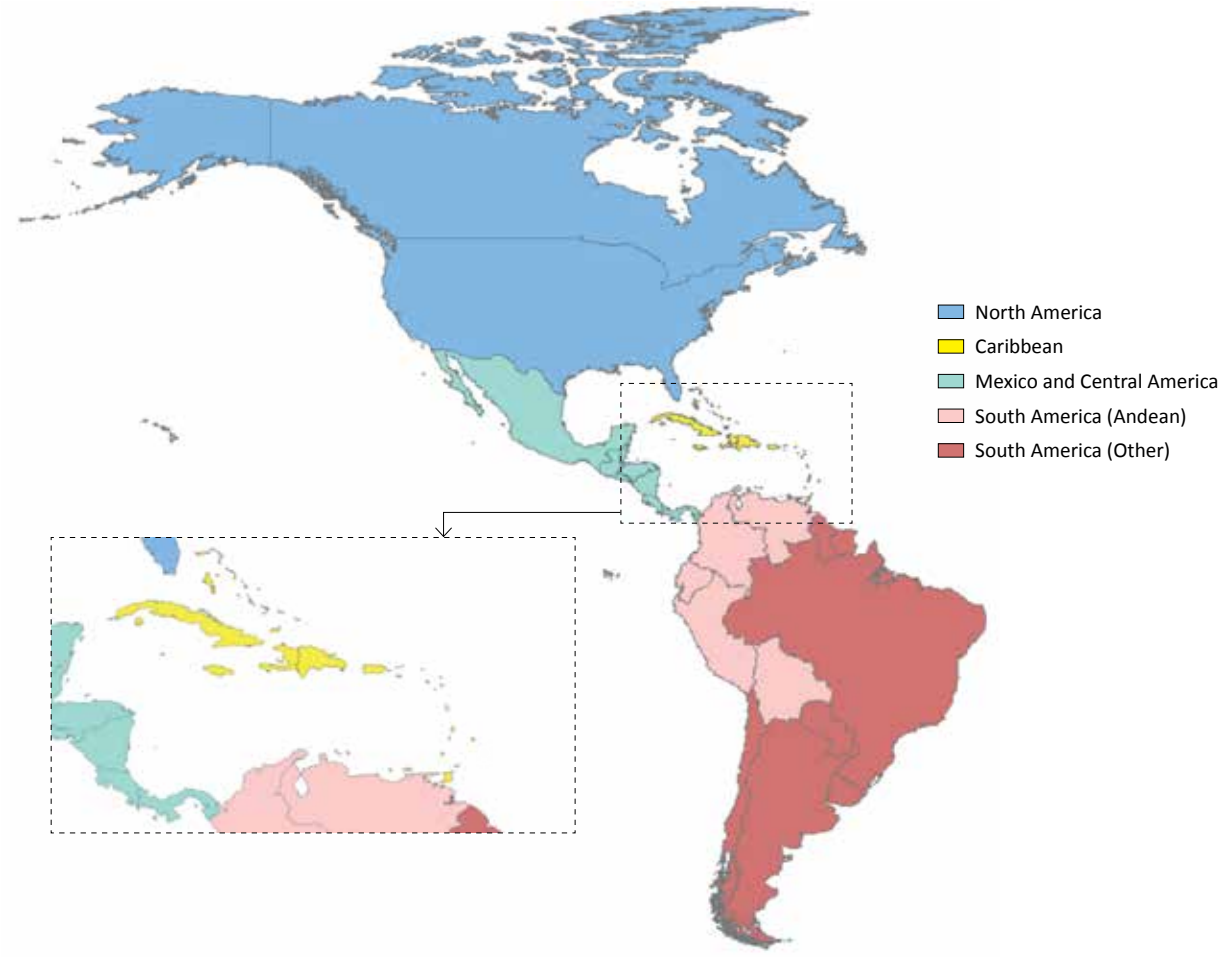


Table 1. Region of the Americas, country division into five subregions for this report.
(Total population of the Region: 942,325,000).

Subregion	Country	Population
North America	**(2 countries)**	**347,435,000**
	Canada	34,350,000
	United States of America	313,085,000
Caribbean	**(13 countries)**	**40,431,000**
	Antigua and Barbuda	90,000
	Bahamas	347,000
	Barbados	274,000
	Cuba	11,254,000
	Dominican Republic	10,056,000
	Grenada	105,000
	Haiti	10,124,000
	Jamaica	2,751,000
	Puerto Rico	3,746,000
	Saint Kitts and Nevis	53,000
	Saint Lucia	176,000
	Saint Vincent and the Grenadines	109,000
	Trinidad and Tobago	1,346,000
Mexico and Central America	**(8 countries)**	**158,018,000**
	Belize	318,000
	Costa Rica	4,727,000
	El Salvador	6,227,000
	Guatemala	14,757,000
	Honduras	7,755,000
	Mexico	114,793,000
	Nicaragua	5,870,000
	Panama	3,571,000
South America (Andean)	**(5 countries)**	**130,518,000**
	Bolivia (Plurinational State of)	10,088,000
	Colombia	46,927,000
	Ecuador	14,666,000
	Peru	29,400,000
	Venezuela (Bolivarian Republic of)	29,437,000
South America (others)	**(7 countries)**	**265,923,000**
	Argentina	40,765,000
	Brazil	196,655,000
	Chile	17,270,000
	Guyana	756,000
	Paraguay	6,568,000
	Suriname	529,000
	Uruguay	3,380,000
	TOTAL:	**942,325,000**

CHAPTER 1:
The Regional Burden of Tuberculosis

The burden of TB in the Americas and elsewhere is measured in terms of estimated TB incidence (**Section 1.1**), prevalence (**Section 1.2**) and mortality (**Section 1.3**). The chapter further presents the burden of MDR-TB measured as the number of MDR-TB cases estimated among notified TB cases (**Section 1.4**). The section on TB/HIV includes the estimates for the number of incident TB cases who are HIV co-infected (**Section 1.5**).

1.1. Incidence

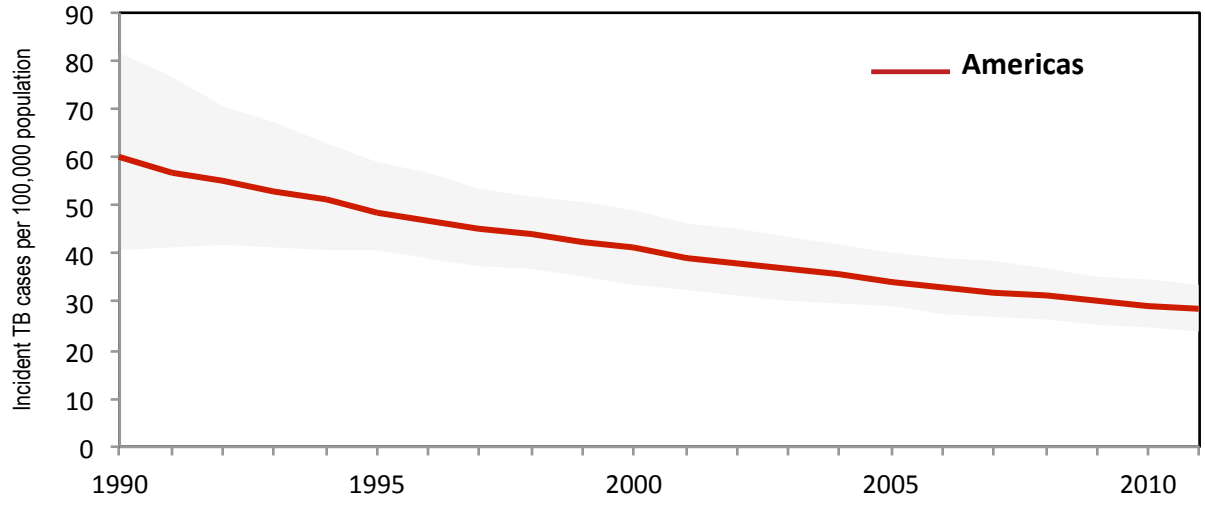
In the year 2011, an estimated 268,400 incident TB cases occurred in the Americas, equivalent to 28 per 100,000 of the population (low/high estimate*: 26-29). The number of incident TB cases was nearly 5,100 TB cases lower compared to 2010. This reflects a continuation of the trend in regional TB incidence observed in the past 20 years (**Figure 2**). Both, absolute number of incident cases and incidence rate are lowest compared to all other WHO Regions (**Table 2**).

Two-thirds (67%) of all incident TB cases 2011 occurred in South America (Andean: 29%; other countries: 38%); 17% occurred in Mexico and Central America, 11% in the Caribbean and 5.1% in North America.

The TB burden relative to the population was highest in the Caribbean, where 75 incident TB cases occurred per 100,000 of the population, followed by South America (Andean: 60; Other: 38), Mexico and Central America (28), and North America (3.9 per 100,000).

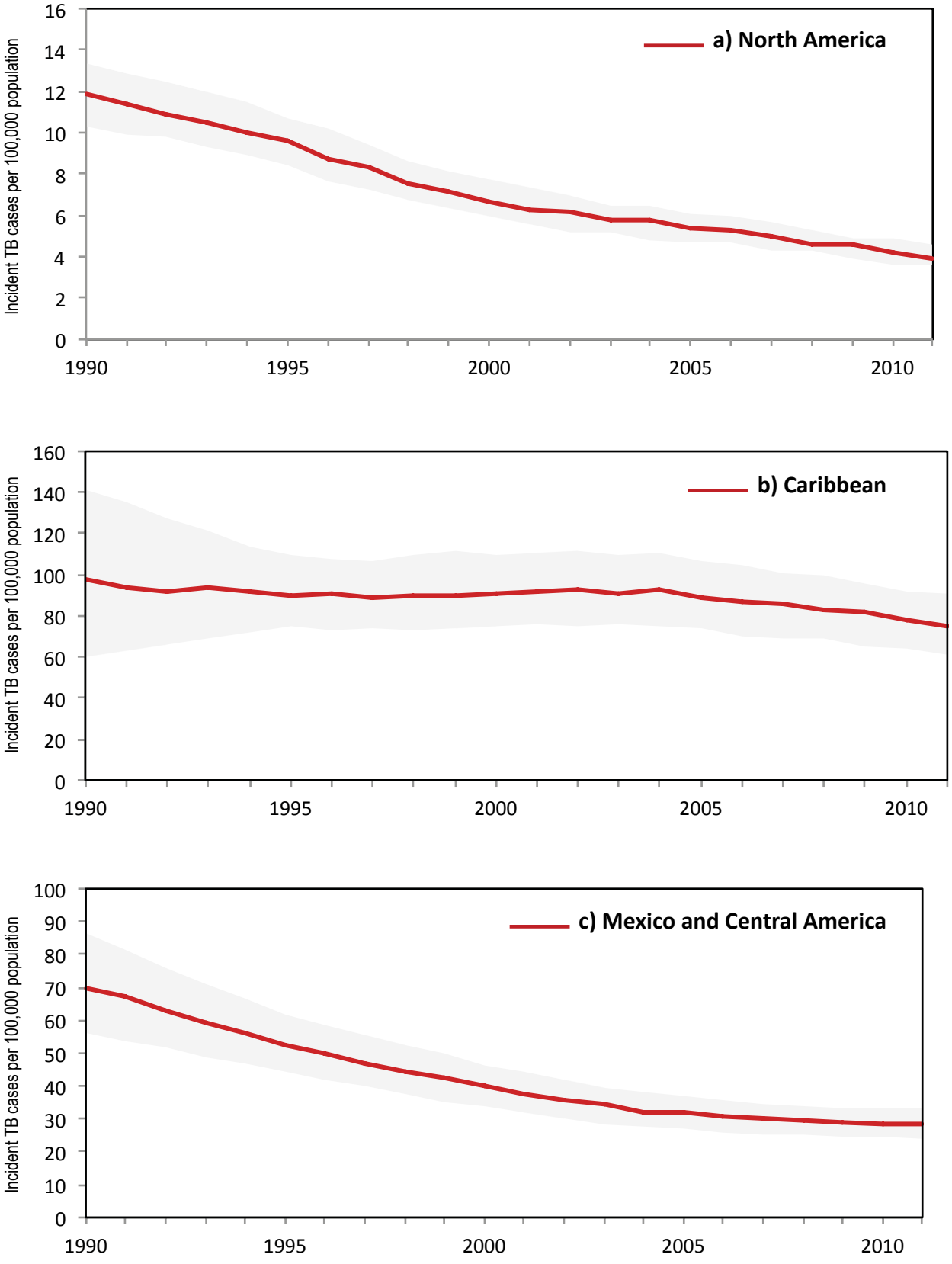
In the past 20 years, incidence rates have been declining continuously in all subregions except for the Caribbean, where a decline was observed only in recent years. The rate in Mexico and Central America has reached a plateau recently (**Figures 3a-d**). This plateau is mainly determined by a slight increase in the number and rate of TB cases estimated and notified in Mexico in the past years (see also **Figure 4c**).

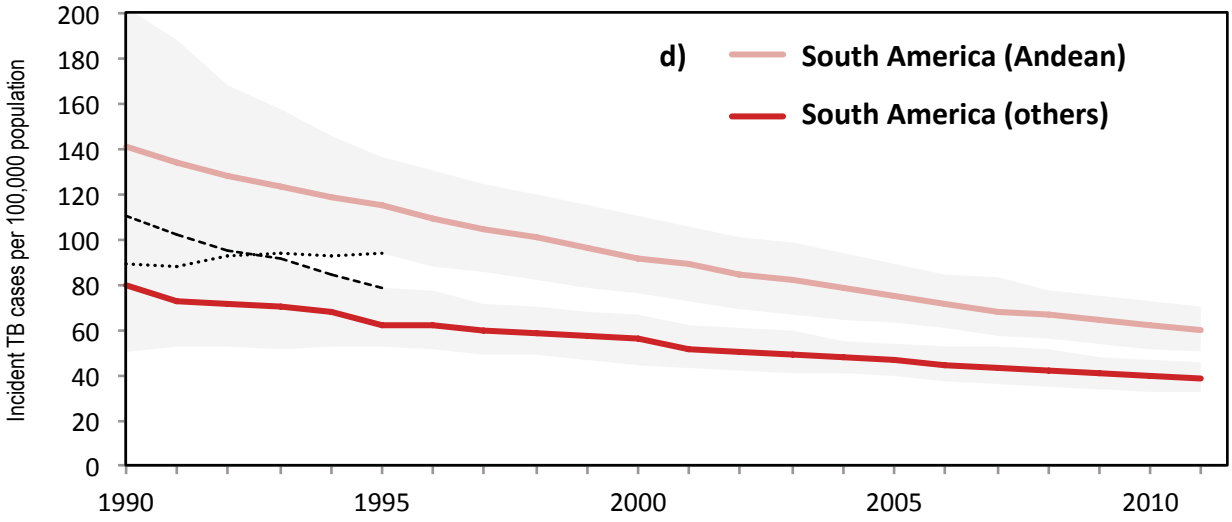
Figure 2. Trend in estimated TB incidence in the Americas, 1990-2011.
(Shaded area represents uncertainty bands[1]).



[1] Lower and upper bounds of uncertainty are defined as the 2.5th and 97.5th centiles of outcome distributions produced in WHO simulations. For detailed methods on the estimates and modeling of data uncertainty, see: WHO Global Tuberculosis Report 2012, Annex 1: Methods.

Figure 3a-d. Trends in estimated TB incidence in 5 Subregions of the Americas, 1990-2011.
(Note different scales. Shaded area represents uncertainty bands).





Countries in North America

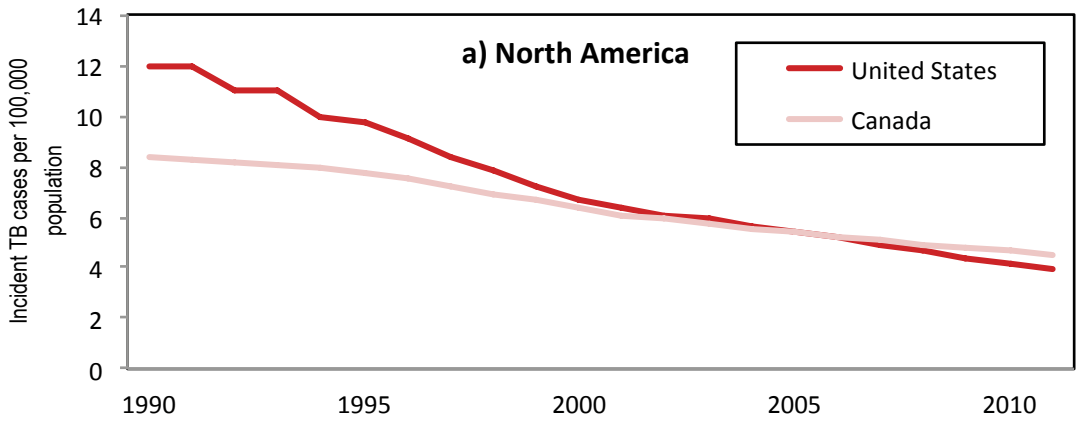
In the United States and Canada, a total of 12,000 and 1,600 incident TB cases were estimated in 2011, respectively. TB incidence rates per 100,000 in both countries were among the lowest in the Americas and continued to decrease in recent years (**Figure 4a**).

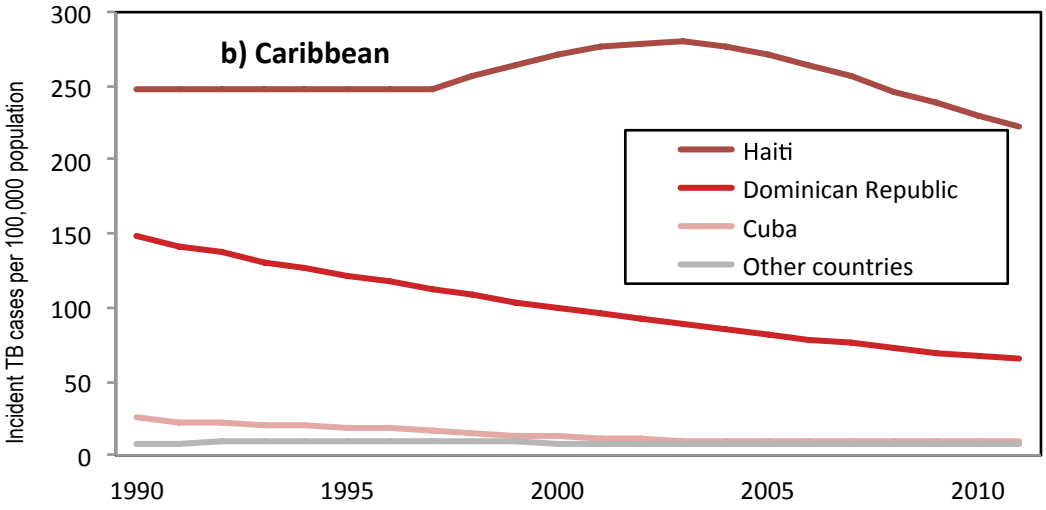
Countries in the Caribbean

Of the 31,100 incident TB cases in the Caribbean, 95% occurred in three countries: Haiti (22,000; 71%), Dominican Republic (6,500; 21%) and Cuba (1000; 3.2%). The remaining 1600 (1.9%) cases occurred in the 10 countries with significantly smaller populations. TB incidence in Haiti was 222 per 100,000 – highest in the whole Region. It was lower in the Dominican Republic (65) and much lower in Cuba (9.3) and the remaining countries (overall: 7.0).

Trends in TB incidence over the past 20 years suggest that TB incidence was rising in Haiti until 2003 but is now declining. It has been declining in the Dominican Republic and Cuba and is constant at low level in the other countries (**Figure 4b**).

Figures 4a-b. Trends in estimated TB incidence in countries by subregion, 1990-2011.
(Note different scales).





Mexico and countries in Central America

In Mexico, 26,000 incident TB cases occurred in 2011 – more than half (58%) of the 44,900 incident TB cases estimated for the whole subregion. The remaining cases occurred in Guatemala (9,000; 20%), Honduras (3,400; 7.6%), Nicaragua (2,400; 5.3%), and the following: El Salvador, Panama, Costa Rica and Belize (together: 4,100; 9.1%).

Estimated TB incidence was highest in Guatemala (61 per 100,000) and Panama (48) and lowest in Costa Rica (12) and Mexico (23). Trends over the past 20 years indicate that TB incidence was declining in most countries since 1990 with the exception of Belize and Panama, where it remained constant over time since 1990. Further, estimated TB incidence in Mexico was increasing slightly over the past years, resulting from an increase in the number of TB cases notified (**Figure 4c**).

Countries in South America (Andean)

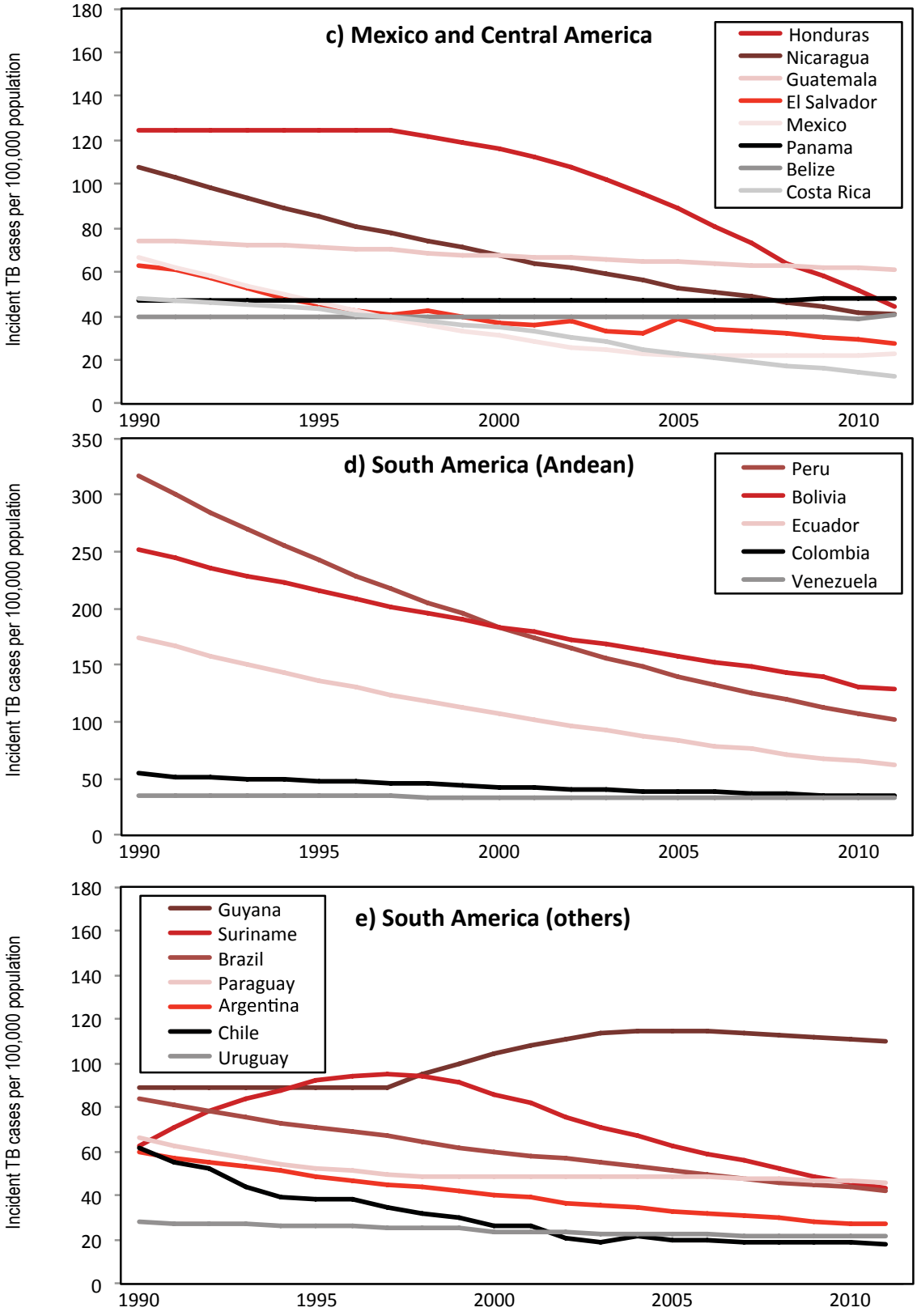
More than one-third of the 77,900 incident TB cases in the Andean countries of South America occurred in Peru (30,000; 39%), ranking 2nd in the Americas. Peru is followed by Colombia (16,000; 21%). Estimated TB incidence per 100,000 population was highest in 2011 in Bolivia (129) and Peru (101) where it had declined substantially over the past 20 years. Incidence was also declining in Ecuador and Colombia, and it was constant at a lower level in Venezuela (**Figure 4d**).

Countries in South America (other)

Of the 101,900 incident TB cases in the other countries of South America, 81% (83,000) occurred in Brazil. – The country currently ranks 1st in the Americas and 17th worldwide by estimated numbers of incident TB cases. It accounted for nearly one-third of all incident TB cases in the Region. Brazil was followed by Argentina with 11,000 cases (11%).

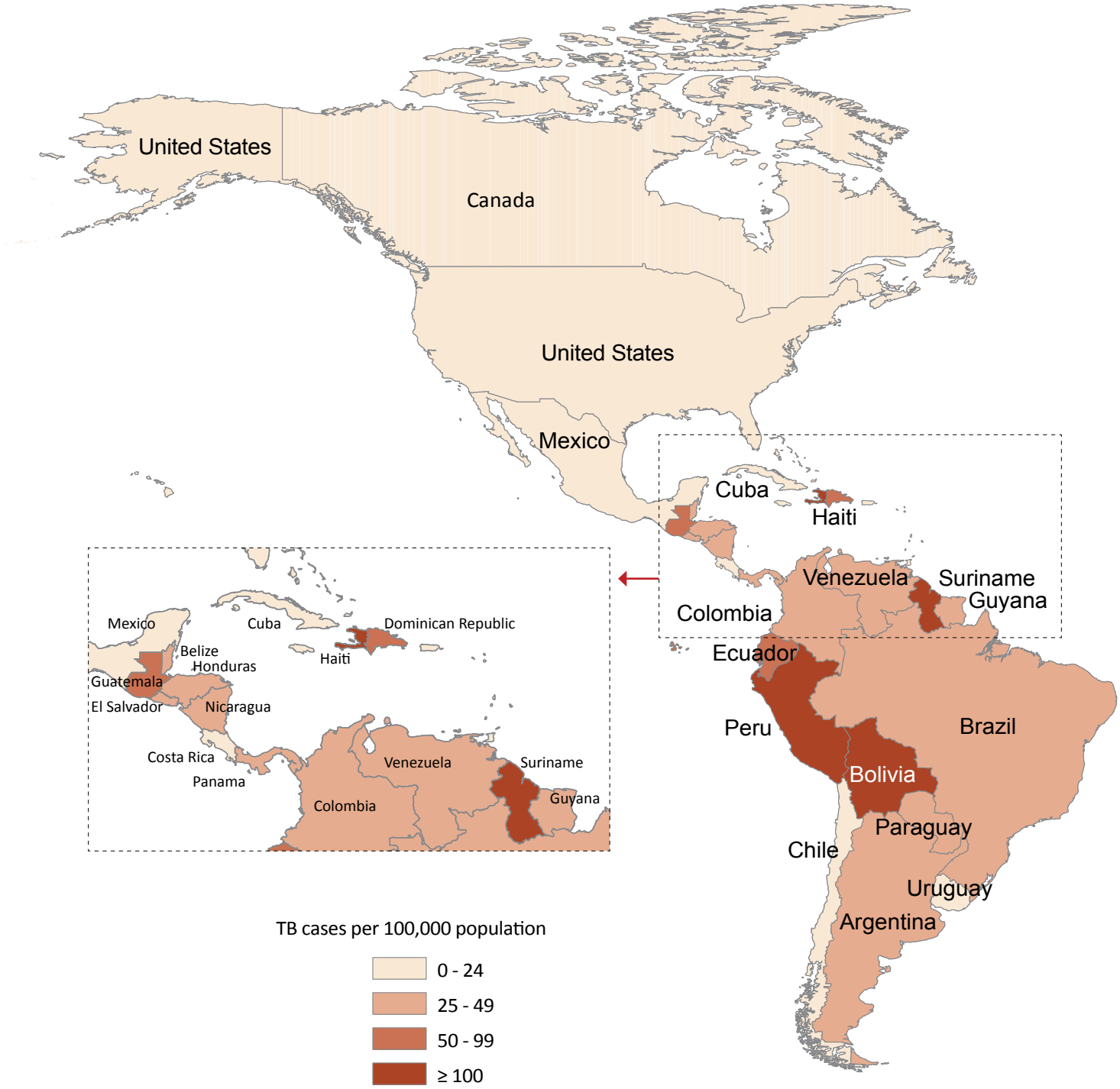
Estimated TB incidence per 100,000 population in 2011 was highest in Guyana (110), where it peaked between 2004 and 2006 and is declining at slow path since. Incidence is declining slowly in all other countries over the past years (**Figure 4e**).

Figure 4c-e (cont.). Trends in estimated TB incidence in countries by subregion, 1990-2011.
(Note different scales).



The geographical distribution of estimated TB incidence in the Americas is shown in **Figure 5**. **Box 1** and **Figure 6** show the top 10 countries in the Americas by total numbers and rates of estimated incident TB cases.

Figure 5. Estimated TB incidence per 100,000 of the population in the Americas, 2011.



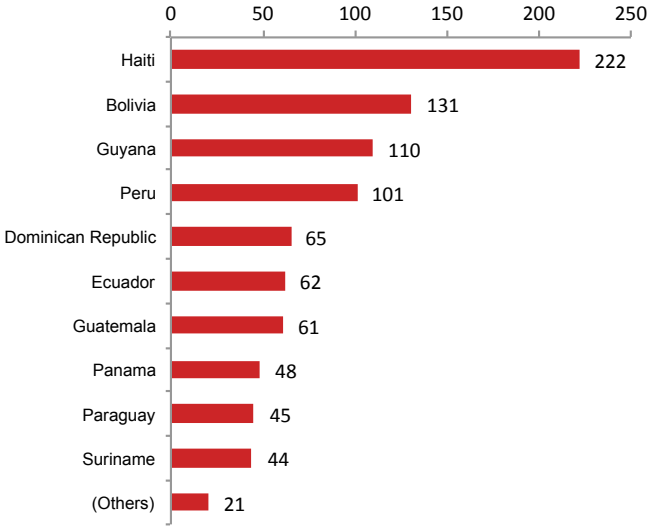
Box 1. Top 10 countries by estimated numbers of incident TB cases, 2011.

(Highlighted in red: > 80% of the regional burden).

#	Country	Incident TB cases	%	Cummulative %
1	Brazil	83,000	31%	31%
2	Peru	30,000	11%	42%
3	Mexico	26,000	9,7%	52%
4	Haiti	22,000	8,2%	60%
5	Colombia	16,000	6,0%	66%
6	Bolivia	13,000	4,8%	71%
7	United States	12,000	4,5%	75%
8	Argentina	11,000	4,1%	79%
9	Venezuela	10,000	3,7%	83%
10	Ecuador	9,800	3,4%	86%
	Others	37,525	14%	100%

Figure 6. Americas: Top 10 countries by estimated TB incidence.

(Per 100,000 population).



1.2. Prevalence

In 2011, there were an estimated 337,000 prevalent TB cases in the Americas, equivalent to 36 per 100,000 population.

The estimated number of prevalent TB cases was 116,000 for the South America Other subregion (34% of the total regional estimate), 103,000 (31%) for the South America Andean subregion, 59,000 (18%) in Mexico and Central America, 42,000 (11%) in the Caribbean and 17,000 (5.1%) in North America.

1.3. Mortality

In 2011, an estimated 20,700 deaths occurred among HIV-negative TB cases in the Americas, equivalent to 2.2 TB deaths per 100,000 population (low/high estimate: 1.5 - 3.1). There has been a continuous decrease in TB mortality in the Americas over the past 20 years (**Figure 7**).

TB mortality per 100,000 population in 2011 was highest in the Caribbean (9.2), and lowest in North America (0.1). Mortality rates have been decreasing in all subregions over the past years (**Figure 8**).

There are currently no estimates at regional level for the number of TB deaths occurring among HIV-positive individuals. Of nearly 15,000 HIV-positive TB cases included in the TB treatment cohort in 2010 (all forms of TB), about 2,900 (19%) were reported as dead. However, this figure does not include incident HIV-positive TB cases not diagnosed or not treated for TB in 2010, those not included in the treatment cohort and those who died after defaulting from treatment or in whom treatment failed.

HIV-positive TB cases included in the 2010 treatment cohort represented only 48% of all incident HIV-positive TB cases estimated for 2010. Assuming that TB mortality is higher among HIV-positive cases not included in the treatment cohorts suggests that the annual number of true TB deaths among HIV-positive individuals is considerably higher than the number of TB deaths reported from the treatment cohort.

Figure 7. Trend in estimated TB deaths per 100,000 of the population in the Americas, 1990-2011.
(HIV-positive TB deaths not included. Shaded area represents uncertainty bands).

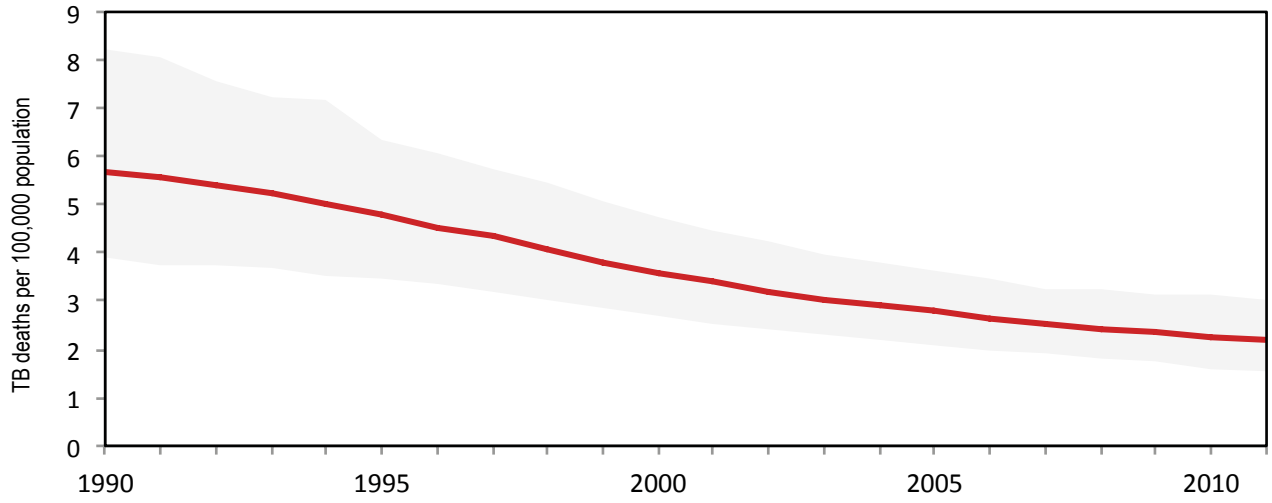
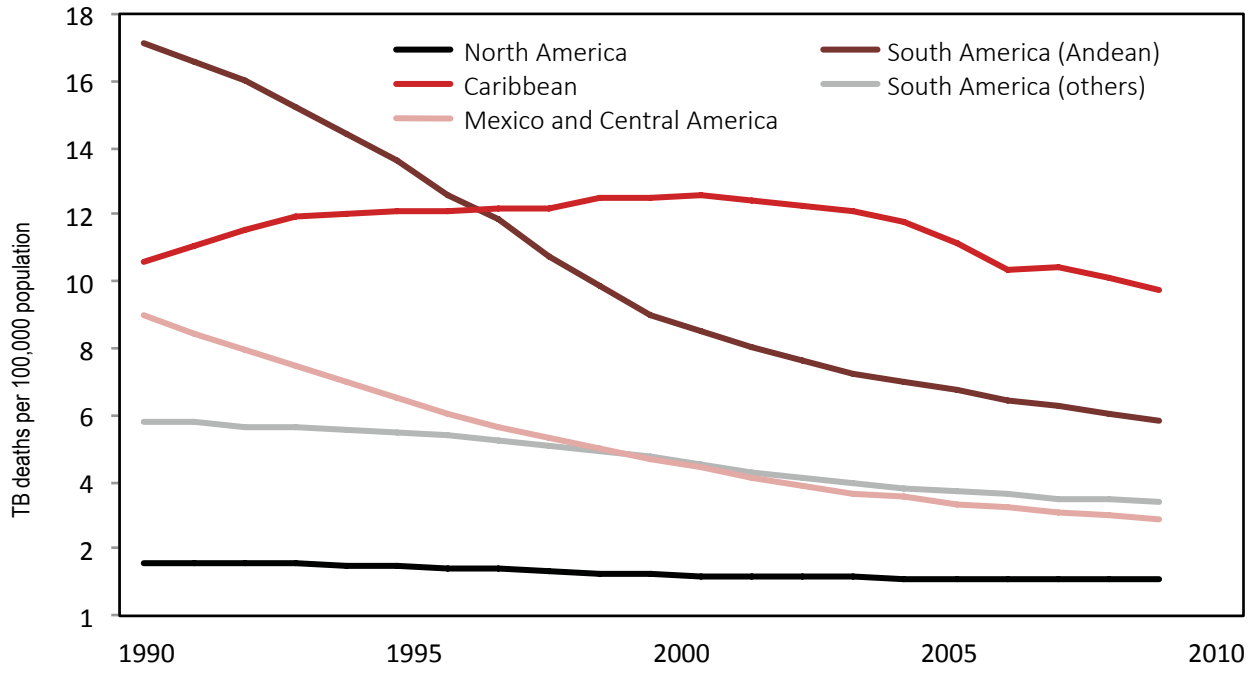


Figure 8. Trends in estimated TB mortality in five subregions of the Americas, 1990-2011.
(HIV-positive TB deaths not included).

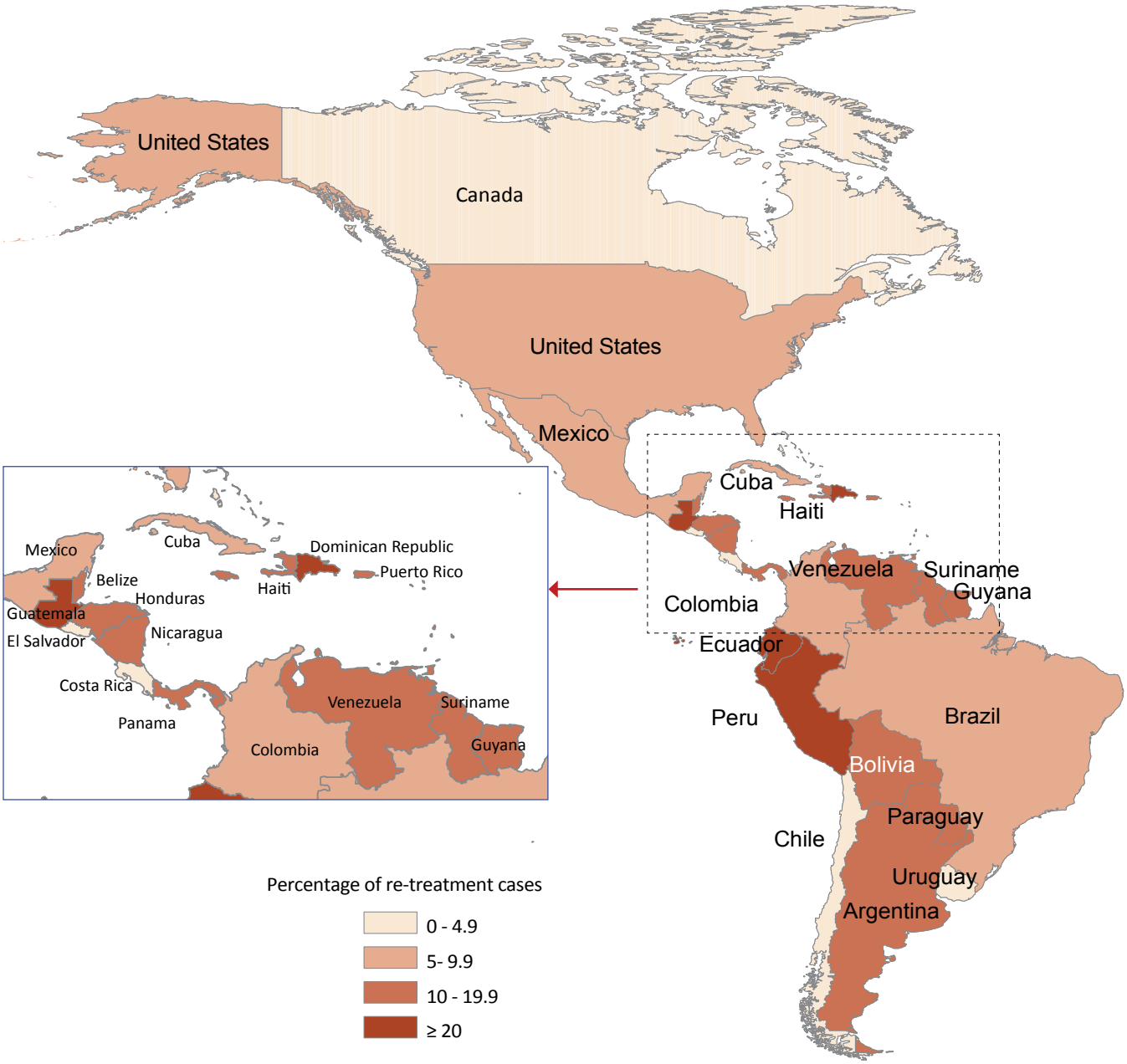


1.4. MDR-TB / XDR-TB

There were an estimated 6,000 MDR-TB cases among notified Pulmonary TB (PTB) cases in 2011 in the Americas. The estimated proportion of MDR-TB was 2.1% (1.4%-3.0%) among new cases and 11% (8.0%-15%) among re-treatment cases.

At country level, the estimated proportion of MDR-TB varied between 0.2% and 6.8% of new PTB cases and between 0% and 26% of re-treatment PTB cases (**Figure 9** and **Figure 10**).[2]

Figure 9. Estimated percentage of previously treated TB cases with MDR-TB.
(The figures are based on the most recent year for which estimates are available, which varies among countries).



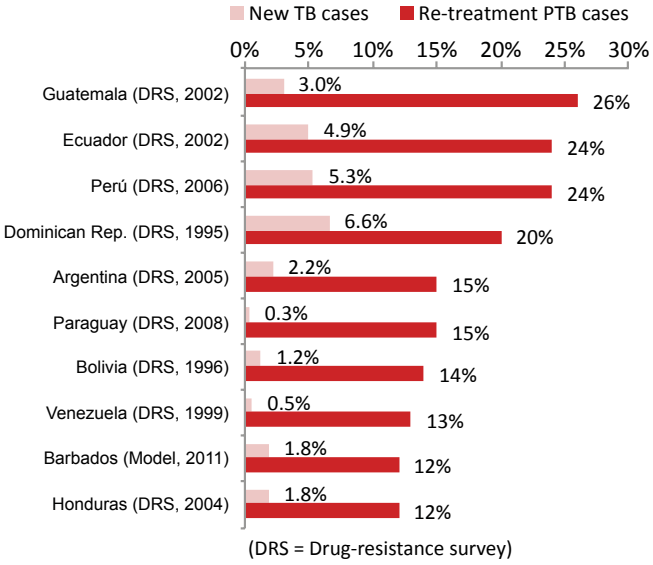
[2] The estimates are based on drug-resistance surveys and models. The most recent estimate available for each of the countries was considered.

Box 2. Top 10 countries by MDR-TB cases estimated among notified PTB cases, 2011.

(Highlighted in red: 80% of the regional burden).

#	Country	Estimated MDR-TB cases	%	% Cummulative
1	Peru	2.100	35%	35%
2	Brazil	1.100	19%	54%
3	Mexico	470	7.9%	62%
4	Ecuador	350	5.9%	68%
5	Argentina	350	5.6%	73%
6	Dominican Republic	320	5.4%	79%
7	Haiti	310	5.2%	84%
8	Colombia	190	3.2%	87%
9	Bolivia	170	2.9%	90%
10	Guatemala	120	2.0%	92%
	Others	480	8.1%	100%

Figure 10. Percentage of MDR-TB cases estimated among notified PTB cases.



By the end of 2011, at least one case of extensively drug-resistant TB (XDR-TB) was reported in 11 countries: Argentina, Brazil, Canada, Chile, Colombia, Dominican Republic Ecuador, Mexico, Peru, the United States and Venezuela.

Seven countries (Peru, Brazil, Mexico, Ecuador, Argentina, Dominican Republic and Haiti) accounted for more than 80% of all estimated MDR-TB cases in the region (**Box 2**). MDR-TB cases estimated among notified cases in Brazil and Peru alone accounted for more than half of all estimated MDR-TB cases in the Region.

1.5. TB/HIV

In 2011, there were an estimated 38,100 HIV-positive incident TB cases in the Americas (high/low estimate 31,000 – 45,700), around 7,000 more than in the previous year, representing 14% of all estimated incident TB in the Region (2010: 11%). The incidence rate of HIV-positive TB cases was 4.0 per 100,000 population (low/high estimate: 3.3 - 4.8).

Two-thirds of all HIV-positive incident TB cases occurred in Brazil, Mexico and Haiti alone. (**Box 3**).

The estimated prevalence of HIV infection among incident TB cases was 21% in the Caribbean, 17% in the South America – Other subregion, 15% in Mexico and Central America, and 8.3% in South America – Andean, and 7.6% in North America.

At country level, HIV prevalence varied between 1.0% and 37% of estimated incident TB cases in 2011. It was higher than 25% in four countries: Belize (37%), Trinidad and Tobago (33%), Suriname (33%) and Dominican Republic (26%); **Figure 11**).

Data on estimated TB incidence, prevalence and mortality, TB-HIV and MDR-TB in the Americas are summarized in **Table 2**).

Box 3. Top 10 countries by estimated numbers of HIV-positive incident TB cases, 2011.

(Highlighted in red: 80% of the regional burden).

#	Country	Incident HIV+ TB	%	Cummulative %
1	**Brazil**	**16,000**	**42%**	**42%**
2	**Mexico**	**4,900**	**13%**	**55%**
3	**Haiti**	**4,300**	**11%**	**66%**
4	**Colombia**	**3,100**	**8.1%**	**74%**
5	**Dominican Republic**	**1,700**	**4.5%**	**79%**
6	**Venezuela**	**1,300**	**3.4%**	**82%**
7	**Guatemala**	**1,100**	**2.9%**	**85%**
8	**Ecuador**	**980**	**2.6%**	**88%**
9	**United States**	**960**	**2.5%**	**90%**
10	**Peru**	**590**	**1.5%**	**92%**
	Others	**3,213**	**8.4%**	**100%**

Figure 11. Top 10 countries by estimated prevalence of HIV among incident TB cases, 2011.

(Countries with at least n=100 incident TB cases only).

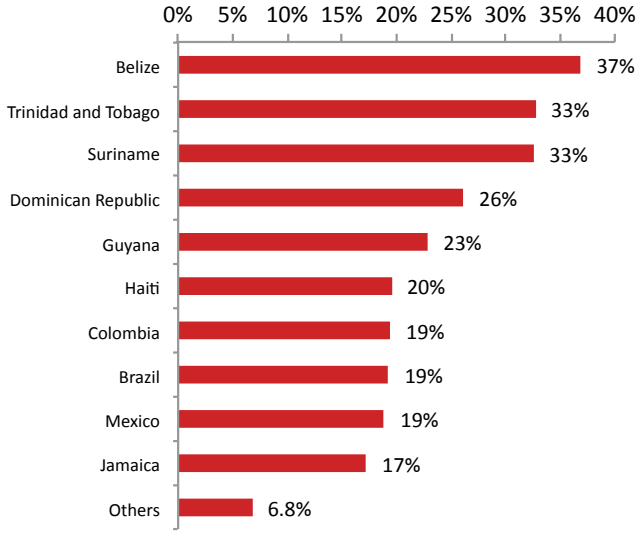


Table 2. Estimated epidemiological burden of TB, 2011.

A) Per absolute numbers in thousands.

	Incidence		Prevalence	Mortality	MDR-TB*
Region	**All forms**	**HIV-positive**	**All forms**	**HIV-negative**	**Notified PTB cases**
North America	14	1,0	17	0.5	0.1
Caribbean	30	6,3	42	3.7	0.7
Mexico and Central America	45	6,9	59	3.1	0.8
South America (Andean)	78	6,5	103	6.5	2.8
South America (others)	102	17	116	6.9	1.5
AMERICAS	268	38	337	21	5.9
AFR	2,245	878	2,516	220	35
EMR	666	9	1,036	99	15
EUR	378	23	503	44	78
SEAR	3,411	142	4,955	476	89
WPR	1,647	36	2,493	125	80
World	**8,616**	**1,125**	**11,840**	**986**	**302**

B) Per 100,000 population.

	Incidence		Prevalence	Mortality	MDR-TB*
Region	**All forms**	**HIV-positive**	**All forms**	**HIV-negative**	**Notified PTB cases**
North America	3,9	0,3	4,9	0,1	0,04
Caribbean	75	15	103	9,2	1,6
Mexico and Central America	28	4,4	38	2,0	0,5
South America (Andean)	60	5,0	79	5,0	2,2
South America (others)	38	6,6	44	2,6	0,6
AMERICAS	28	4,0	36	2,2	0,6
AFR	262	102	294	26	4,0
EMR	109	1,4	170	16	2,5
EUR	42	2,5	56	4,9	8,7
SEAR	186	7,7	271	26	4,9
WPR	91	2,0	138	7,0	4,4
World	**124**	**16**	**171**	**14**	**4,4**

AFR = Africa Region EMR = Eastern Mediterranean Region EUR = European Region SEAR = South East Asian Region WPR = Western Pacific Region

* MDR-TB cases estimated among notified pulmonary tuberculosis (PTB) cases.

CHAPTER 2:
Tuberculosis Control

This chapter presents data on the current situation and recent progress of TB control in the Americas. It is divided into seven sections: *Case notification* (**Section 2.1**), *Case detection* (**Section 2.2**), *Treatment outcomes* (**Section 2.3**), *Laboratory strengthening* (**2.4**), *MDR-TB diagnosis, detection and treatment* (**Section 2.5**), *TB/HIV collaborative activities* (**Section 2.6**), and *Strengthening of TB control: training and capacity building* (**Section 2.7**).

Trends in tuberculosis case notification are driven by various factors including changes in case finding efforts (e.g. increase in the number of health facilities that provide TB services), changes in recording and reporting systems (e.g. changes in case definitions, expanding reporting to the private sector) and underlying TB incidence (e.g. HIV-driven increase in TB case notifications).

If carefully collected and analyzed, notification data can provide valuable insights into the occurrence and the characteristics of TB in different groups of cases (i.e. by TB site, smear result, sex and age groups), which may have important implications for TB control. A particular sub-section is devoted to the notification of childhood TB in the Americas.

The case detection rate (CDR), defined as the ratio of notified (new and relapse) TB cases and the number of estimated incident TB cases is used to estimate the proportion of incident TB cases with access to TB control under the DOTS strategy. It is one of the major target indicators for global TB control. The WHO has recently moved away from reporting CDR among sputum smear-positive TB cases. Instead, estimates of case detection rates for all forms of TB are used for reporting.

Monitoring of treatment outcomes of TB patients treated in the NTP is one of the major components of the Stop TB strategy. The corresponding section in this report provides a detailed overview about trends in treatment outcomes reported for new smear-positive TB cases. Further, the most recent data on treatment outcomes at subregional level and across different groups of cases are presented. The Top-10 countries with the highest proportions of unfavorable treatment outcomes (i.e. failure, death, default) are presented.

The section on management of MDR-TB focuses on the scale-up of MDR-TB control measures (trainings, guidelines) at country-level, the coverage of drug-susceptibility testing (DST), case detection of MDR-TB, and the provision of second-line treatment.

The section on collaborative TB/HIV activities focuses on the progress in the Americas in terms HIV counseling and testing and provision of co-trimoxazol preventive therapy (CPT) and antiretroviral treatment (ART) as well as activities for the prevention of TB among people living with HIV.

Finally, efforts for strengthening TB control in the Americas such as trainings and workshops organized by the WHO and its partners are presented.

2.1. Case notification

In 2011, around 233,200 TB cases were notified in the Americas, equivalent to 25 per 100,000 population. A breakdown of notified TB cases is shown in **Figure 12**.

2.1.1. Cases by treatment history

Of all TB cases notified in 2011, around 208,200 (89%) were new cases and 21,800 (9.3%) were re-treatment cases, classified as relapse cases (10,000), re-treatment after default (6,200), re-treatment after failure (1,000) or other types of re-treatment (4,500). Treatment history was not classified in nearly 3,200 cases (1.4%).

The proportion of notified re-treatment TB cases varied at country level between 2.9% and 25% (**Figure 13**).

2.1.2. Cases by site of disease

Of all new TB cases notified, around 172,600 (83%) were new pulmonary TB (PTB) cases and 34,200 (16%) were new extrapulmonary TB (EPTB) cases. For the remaining 1,400 TB cases, the site of disease was not reported. The proportion of EPTB cases varied at country level between 5.8% and 35% (**Figure 14**). High variation in the proportion of EPTB cases across countries may be due to differences in case definitions or diagnostic capacity.

2.1.3. Cases by bacteriology

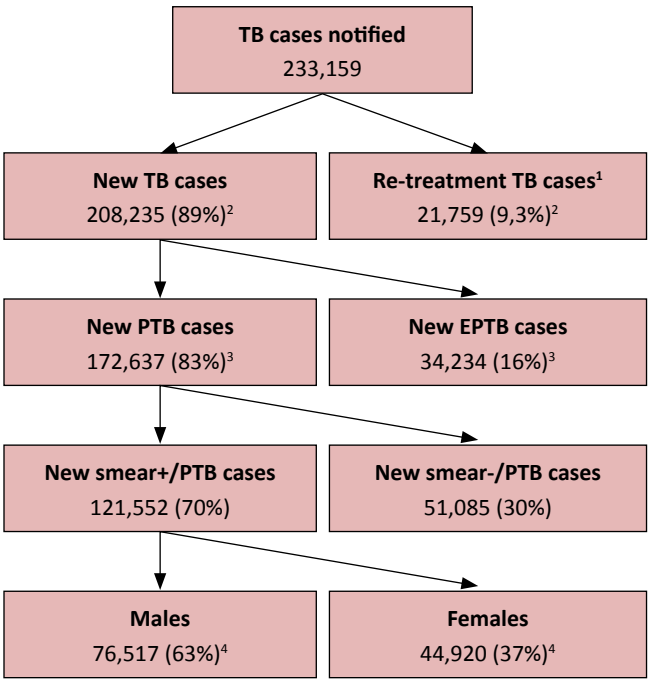
Of all new PTB cases notified in 2011 in the Americas, 123,100 (71%) were bacteriologically confirmed by any laboratory method, and 121,600 (70%) were new smear-positive PTB cases, 13 new smear-positive PTB cases per 100,000 population, respectively.

At subregional level, the proportion of PTB cases with bacteriological confirmation was lower than average in South America and the Caribbean. It was higher than average in North America and Mexico and Central America (**Table 3**).

At country-level, the proportion of new pulmonary TB cases with bacteriological confirmation by any laboratory method varied between 53% and 98% (**Figure 15**).

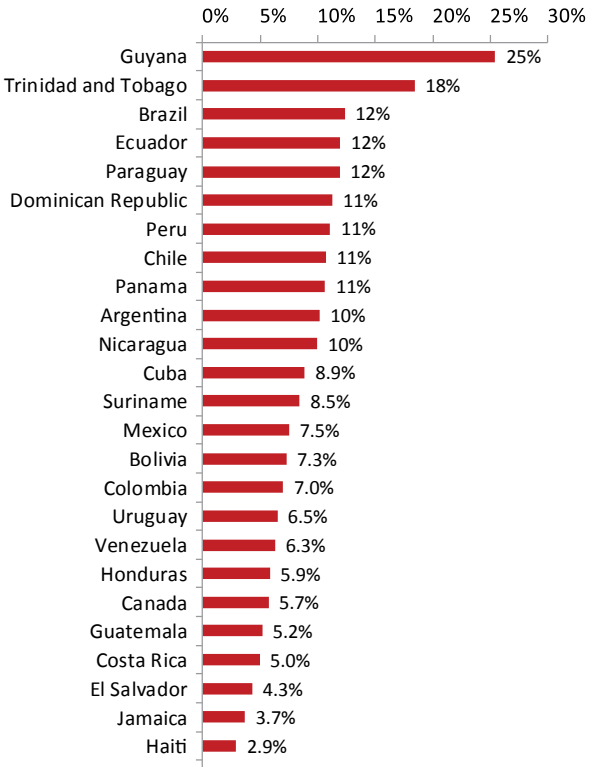
The proportion of new pulmonary TB cases who were positive by smear microscopy varied across countries between 45% and 90% (**Figure 15**).

Figure 12. Overview of TB cases notified in the Americas, 2011.



PTB = Pulmonary TB; EPTB=Extrapulmonary TB
[1] Including relapse, re-treatment after default, re-treatment after failure and other re-treatment cases.
[2] History of treatment was not reported for 1.4% of all notified cases.
[3] Site of disease was not reported for 0.7% of new cases.
[4] Sex was not reported for 0.1%.of new smear-positive PTB cases.

Figura 13. Proportion re-treatment of all notified TB cases by country, 2011.*



*Countries with at least 100 TB cases notified in 2011; the United States of America did not report new and re-treatment cases separately.

Table 3. New PTB Cases by bacteriology (subregions).

	New PTB cases 2011	
Region	**% bact. confirmed**	**% smear-positive**
North America	84%	45%
Caribbean	70%	66%
Mexico and Central America	82%	81%
South America (Andean)	82%	78%
South America (Other)	70%	66%
Americas	**76%**	**70%**

Figure 14. Proportion extrapulmonary of all new TB cases by country, 2011.

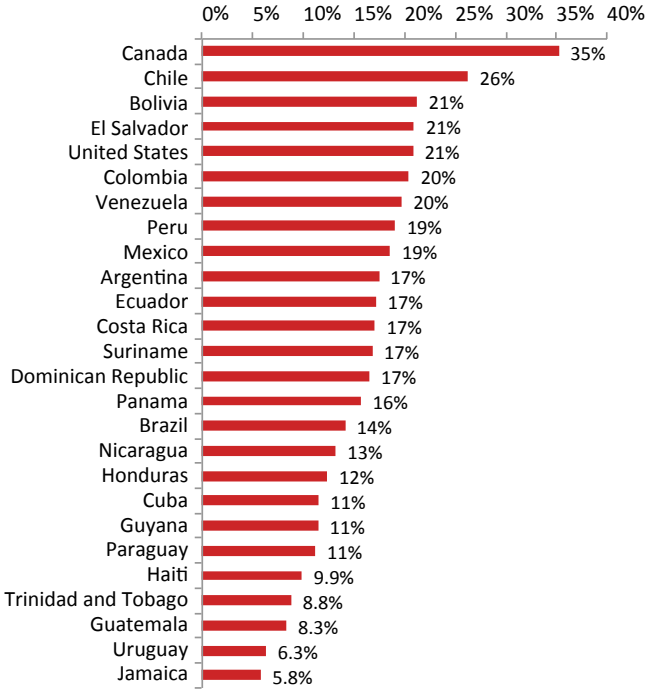
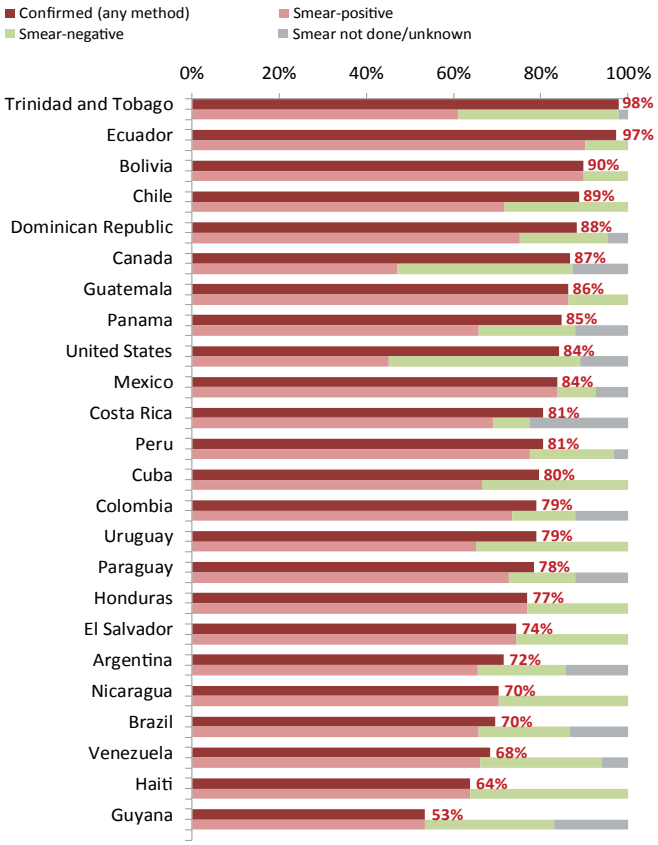


Figure 15. New PTB Cases by bacteriology, 2011.

(Percentages indicate proportions confirmed by any laboratory method).

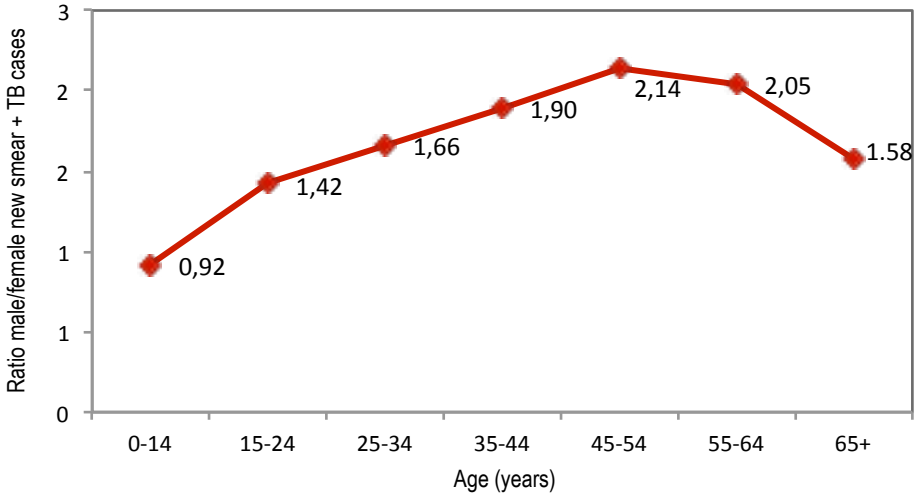


2.1.4. Cases by sex and age group

Of all new smear-positive PTB cases notified in the Americas in 2011, around 76,500 (63%) were male and 44,900 (37%) were female.[3] The male/female ratio was 1.70. It was lower in younger age and in age 65 years and older (**Figure 16**).

[3] By the time this report was made, Peru had not provided data for smear-positive TB cases by sex and age-group combined. In order to estimate numbers and rates, the total number of smear-positive TB cases notified in 2011 were applied to relative proportions for sex and age of smear-positive TB cases notified in 2008 (last available TB data for sex and age group).

Figure 16. Ratio of male vs. female new sputum smear-positive TB cases by age group in the Americas, 2011.



Among males, the notification rate of new smear-positive TB cases across all age groups was 16 per 100,000 men, and among females it was 9.2 cases per 100,000 women.

Among both, males and females, case notification varied considerably by age: The rate of new smear-positive TB cases per 100,000 was highest in young adolescent/adult age and declined in older age groups (**Figure 17a**).

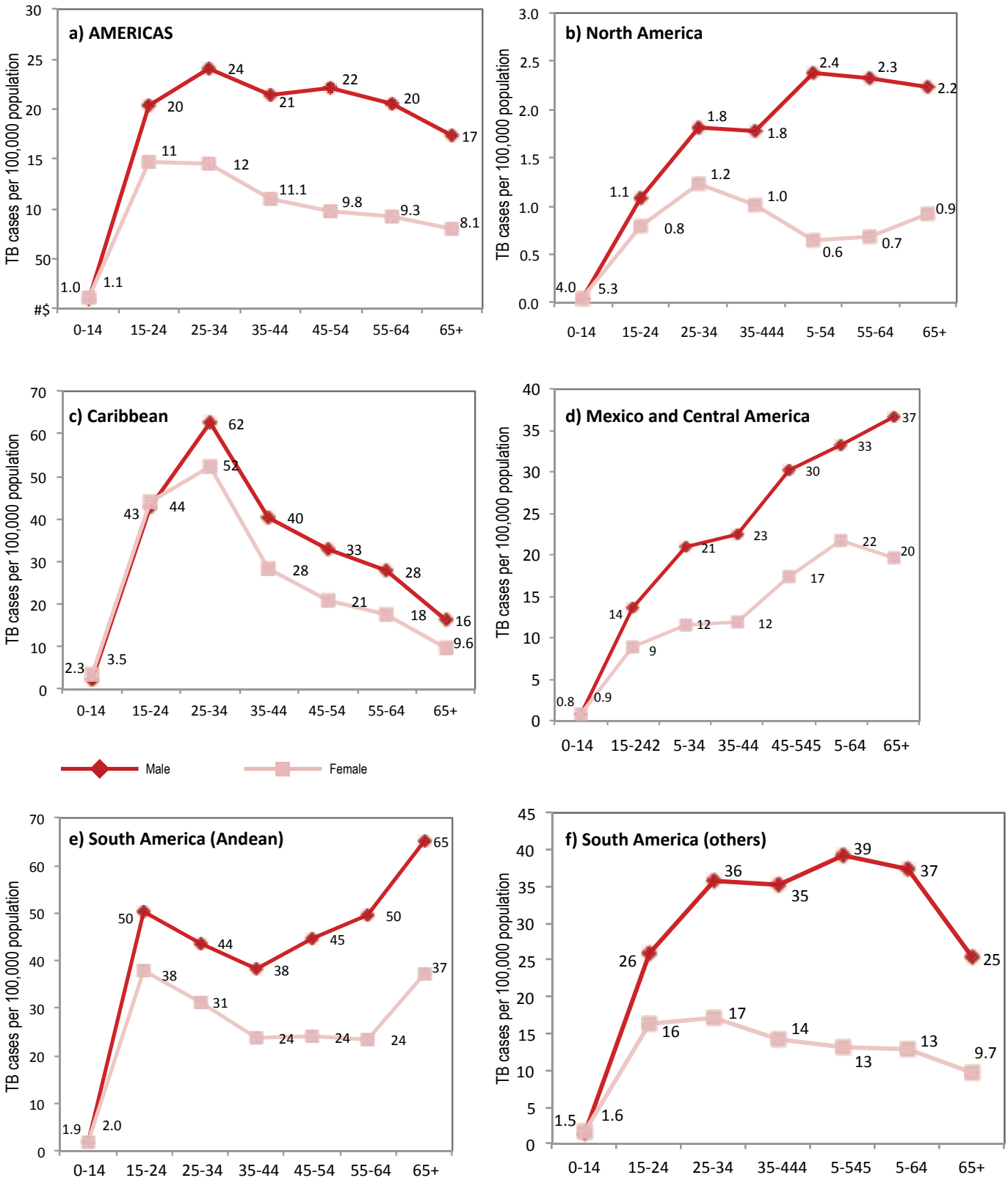
Notification rates of smear-positive TB cases by sex and age group varied in the five subregions (**Figure 17b-f**). Rates were generally higher among males in all subregions; however, the difference was most often smaller in younger age groups.

In North America notification rates were highest in males aged 45 and older. They were lower in females across all age groups (except in children) with a peak in young female age and a second peak in senior age (**17b**). In the Caribbean, notification rates for both, males and females, were highest in young adults aged 25-34 years (**17c**).[4] In Mexico and Central America notification rates for both, males and females, increased with age (**17d**). In the Andean countries of South America, TB case notification rates for both, males and females, showed a double peak in the population aged 25-24 years and 65 years and older (**17e**). In the other countries of South America, notification rates were highest in male adult age whereas they showed a peak in young women (**Fig. 17f**).

Interpretation of these differences should be made with caution, as they may relate to a variety of factors such as age- and sex-specific risk of TB, differences in case detection, recording and reporting, and differences in TB/HIV co-infection. High notification rates in younger age groups, such as in the Caribbean, might indicate a more current TB epidemic with increased transmission coupled with the consequences of converging TB and HIV epidemics.

[4] In the Caribbean, case notification rates are mainly determined by Haiti and Dominican Republic with around 94% of new smear-positive TB cases being notified in these two countries (2011).

Figure 17a-c. New smear-positive TB case notification rate by sex and age group in the Americas and five subregions, 2011.
(Note different scales).



2.1.5. Childhood tuberculosis

In 2011, around 9,800 children (age: 0-14 years) were notified as new TB cases in the Americas, equivalent to 5.1% of all new TB cases notified.[5]

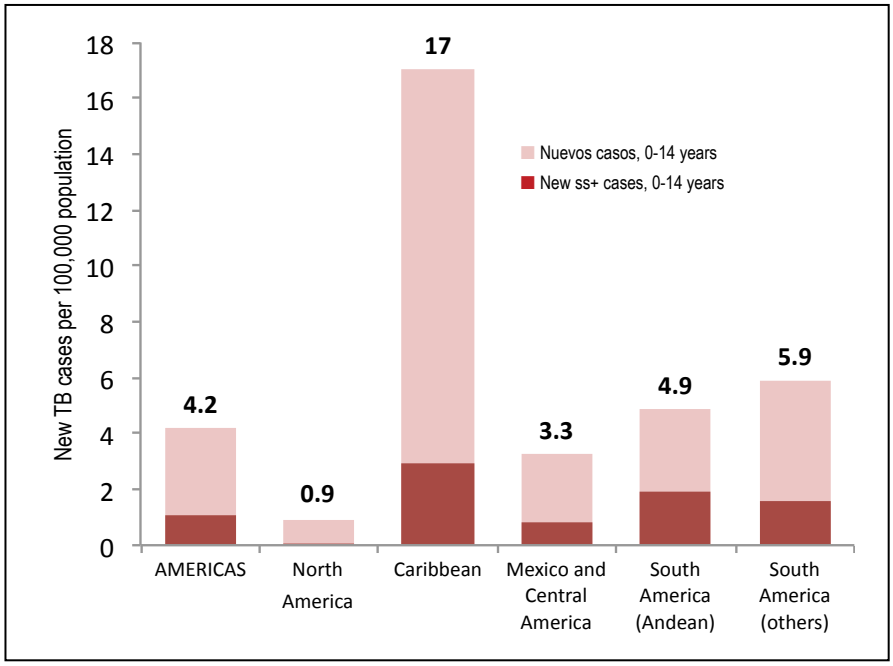
More than half of all childhood TB cases were notified in South America (Andean: 1,900/ 19%; Other: 3,300/40%). A further 1,800 TB cases in childhood (18%) were notified in the Caribbean, 1,600 (16%) in Mexico and Central America, and 650 (6.6%) in North America.

Nearly one-fourth of the childhood TB cases reported were smear-positive, 54% were smear-negative, and 22% were extra-pulmonary TB cases.[6]

The notification rate of childhood TB in the Americas was 4.2 per 100,000 children. In the Caribbean, the rate was highest compared to all other subregions in the Americas, more than four times higher than the regional rate (**Figure 18**). The proportion of childhood TB varied at country level between 1.7% and 15% of all notified new cases (**Figure 19**).

Variation in the notification of childhood TB cases across the countries may reflect differences in case finding practice (e.g. contact tracing), under- or over-diagnosis of childhood TB, differences in reporting practices or differences in true incidence.

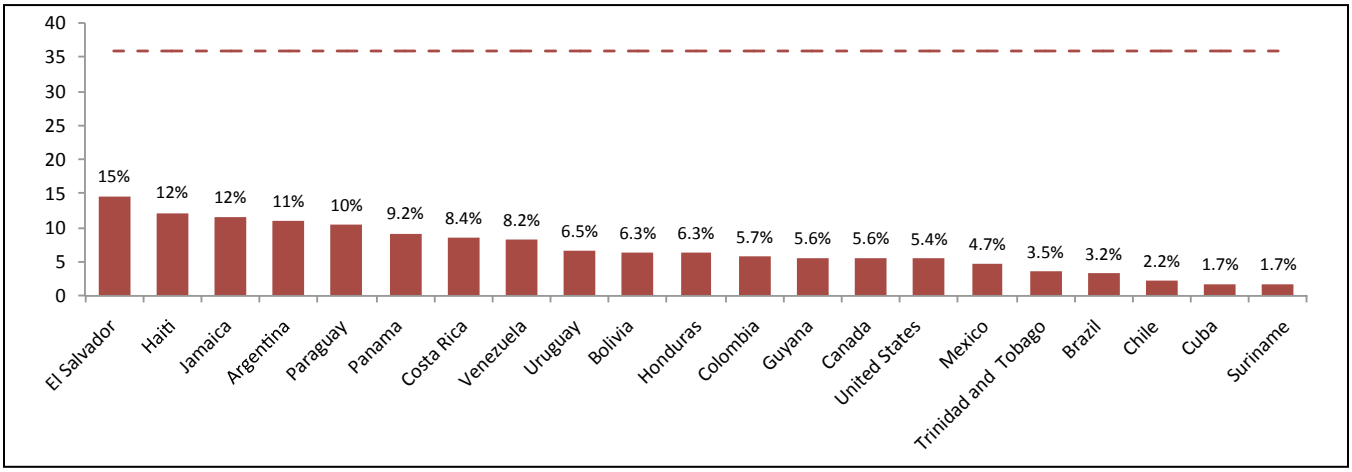
Figure 18. Childhood TB case notification rates (age 0-14 years) in the Americas and five subregions, 2011.



[5] New cases with age-related data available only, representing 93% of all new TB cases notified in 2011; data availability was lower for smear-negative and extrapulmonary cases

[6] Under-reporting of age-related cases among smear-negative and extrapulmonary TB cases may have led to an over-estimation of the proportion of smear-positive TB cases.

Figure 19. Notified new cases of TB in children (0-14 years) by country as percentage of all new TB cases notified, 2011.[7]



2.1.6. Case notification in overseas territories and island nations

Eleven overseas territories and island nations with a total population of approximately 675,100 people (2011) are located within the Americas – the Caribbean Sea and the Northern Atlantic (Bermuda).

In 2011, a total of 27 TB cases were reported from seven of these territories and island nations, 20 of these TB cases were new sputum smear-positive cases (**Box 4**).

The overall case notification rate (all forms of TB) for all 11 territories and island nations together was 4.0 per 100,000 population.

Box 4. TB case notification in 11 territories and island nations located in the Americas, 2011.

Island/Territory		Population	TB cases notified	Rate per 100,000
Anguilla	(British)	16	-	-
Aruba	(Dutch)	108	8	7.4
Bermuda	(British)	65	1	1.5
British Virgin Islands	(British)	23	-	-
Cayman Islands	(British)	57	2	3.5
Curaçao	(Dutch)	146	1	0.7
Dominica		68	3	4.4
Montserrat	(British)	6	-	-
Saint Marteen	(Dutch)	38	2	5.2
Turks and Caicos Island	(Dutch)	39	10	26
US Virgin Islands	(USA)	109	-	-
TOTAL		675	27	4.0

[7] Included all the countries with at least 100 new TB cases notified in 2011; dashed line indicates Regional average: 5.1%. Ecuador, Guatemala, Dominican Republic, Nicaragua and Peru not considered because these countries reported only new smear-positive cases by age-group.

2.2. Case detection

The case detection rate (CDR) for all TB cases is defined as the number of new and relapse TB cases that were diagnosed and notified by National TB Programs, divided by the estimated incident TB cases of that year. The CDR has been steadily increasing in the Americas over the past years, i.e. from 70% in the year 2001 to 84% in the year 2011 (**Table 4** and **Figure 20**). The estimate for 2011 was highest in South America (89% and lowest in the Caribbean (66%; **Table 4**).[8]

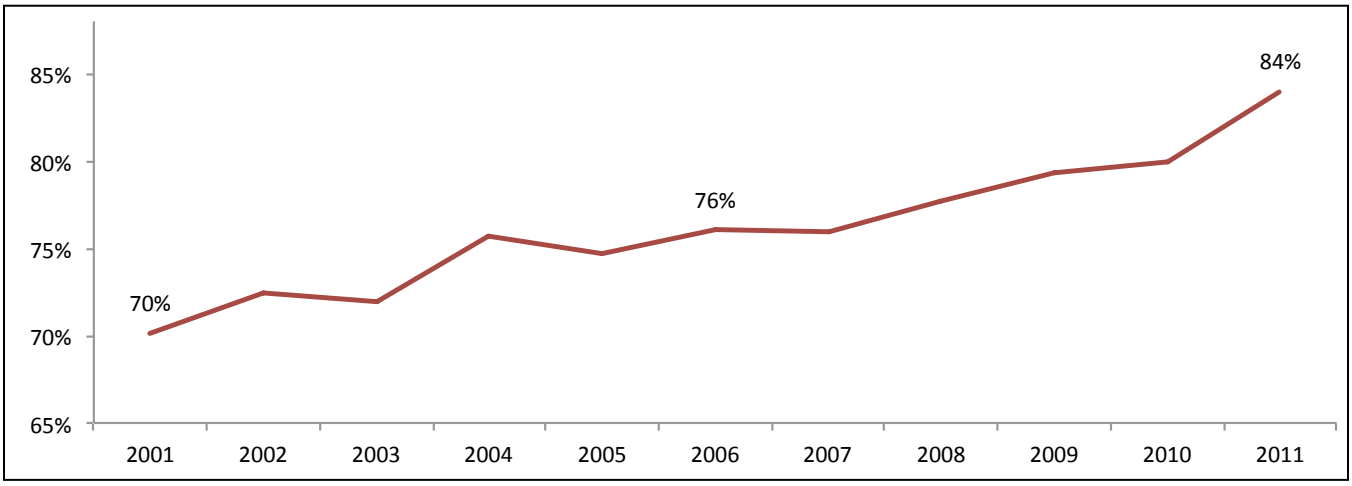
Case detection varied considerably at country level (**Figure 21**).

Very high CDRs, especially those exceeding 100% (El Salvador, Peru, Nicaragua, Uruguay), may indicate a scale-up in case finding efforts to find prevalent cases, or under-estimation (and the need for revision) of TB incidence.

Table 4. Case detection rates for all TB cases (%), 2001-2011.

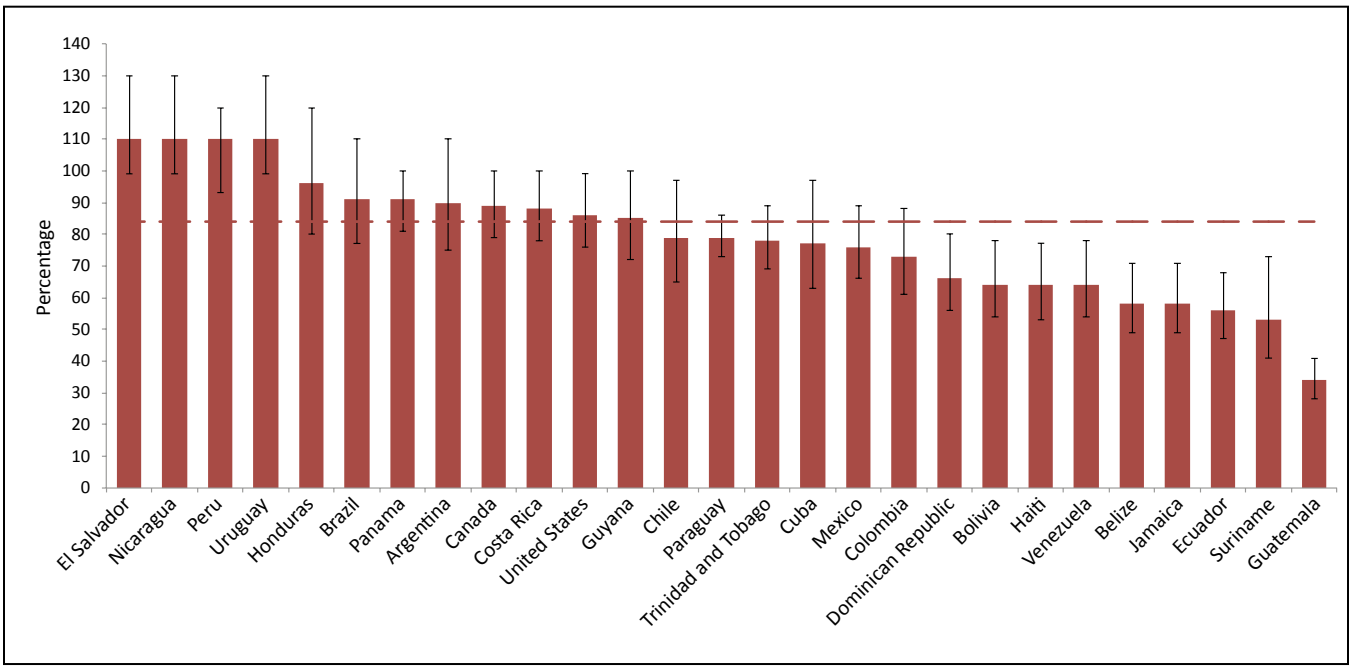
Region	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
North America	88	89	87	85	88	86	88	86	89	86	88
Caribbean	48	50	57	57	58	58	58	62	62	62	66
Mexico and Central America	63	62	60	60	68	69	73	77	80	86	73
South America (Andean)	73	73	70	72	71	76	74	77	77	78	80
South America (others)	74	77	76	81	78	80	79	80	82	84	89
AMERICAS	70	72	72	76	75	76	76	78	79	80	84
AFR	38	40	41	43	42	44	45	47	48	60	61
EMR	28	32	34	38	47	51	59	60	62	63	62
EUR	77	79	76	79	79	81	80	79	78	73	73
SEA	48	50	53	55	58	62	63	64	66	61	62
WPR	42	42	51	60	66	69	71	71	70	79	81
World	45	47	49	53	56	59	60	61	62	65	66

Figure 20. Case detection rate (all TB cases) in the Americas, 2001-2011.



[8] The low CDR in the Caribbean was due mainly to that estimated for Haiti and the Dominican Republic (see: Figure 21).

Figure 21. Case detection rate (all TB cases) in countries of the Americas, 2011.
(Countries with at least n=100 estimated incident TB cases only; dashed line indicates Regional CDR: 84%).



Public-public and public-private mix initiatives (PPM) contribute to case detection in the Americas. Data submitted by 17 countries suggest that in 2011 at least 8,200 TB cases were diagnosed according to NTP guidelines by non-NTP public providers in the Region, and at least 600 TB cases were diagnosed by private providers collaborating with the NTP (**Box 5**).

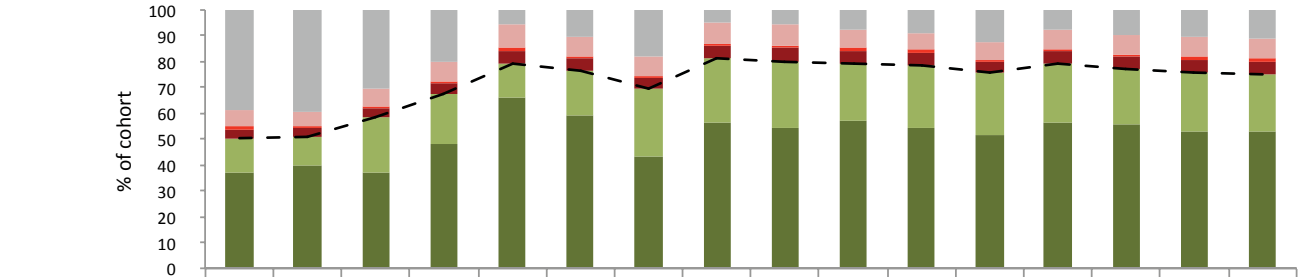
Box 5. New TB case notification by public non-NTP and private health care providers, 2011.
(Countries with more than 5% of new TB cases notified by public non-NTP or private providers in 2011).

Country	New cases notified		Of total new TB case notification
	Public non-NTP	Private	
Suriname	118	1	92%
El Salvador	551	30	30%
Paraguay	450	18	18%
Peru	5,900	3	18%
Chile	70	161	9.1%
Nicaragua	0	223	7.9%
Venezuela	287	93	5.9%

2.3. Treatment outcomes

In the Americas, around 126,400 new sputum smear-positive TB cases were included in the 2010 treatment cohort. Of these, 95,200 (75%) were successfully treated (i.e. either cured or treatment completed). In the recent years, the treatment success rate was stable or decreased slightly (**Figure 22**).

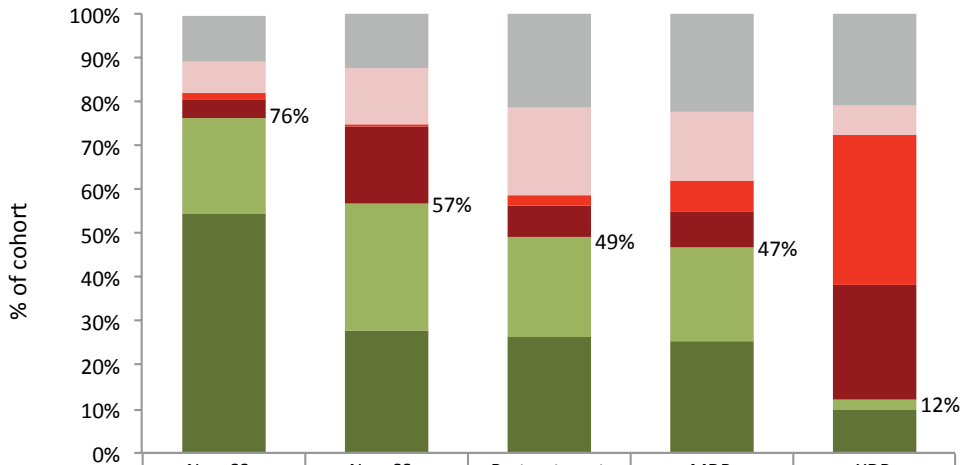
Figure 22. Trends in new smear-positive treatment outcomes, Americas (1995 – 2010 cohorts).



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Not reported	39%	39%	30%	20%	5%	11%	18%	5%	6%	8%	9%	13%	8%	10%	11%	11%
Defaulted	6%	6%	7%	8%	9%	8%	7%	8%	8%	7%	7%	7%	7%	7%	8%	8%
Failed	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Died	3%	3%	4%	4%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Completed	14%	11%	22%	19%	13%	17%	26%	22%	26%	22%	24%	24%	22%	21%	23%	22%
Cured	37%	40%	37%	48%	66%	60%	43%	56%	54%	57%	55%	52%	57%	56%	53%	53%
Treatment success	50%	51%	58%	67%	79%	76%	69%	81%	80%	79%	79%	76%	79%	77%	76%	75%

Treatment success was lower among new smear-positive TB cases who were HIV-positive compared to HIV-negative individuals (57% vs. 76%), mainly due to higher death rates (18% vs. 4.4%) and higher default rates (13% vs. 7.3%) in this group (**Figure 23**).

Figure 23. Comparison of treatment outcomes in different groups of TB cases in the Americas (2010 cohort).
(Percentages beside the bars show treatment success rates).



	New SS+ (HIV-/?) (N=126,437)	New SS+ (HIV+) (N=5,433)	Re-treatment (N=17,498)	MDR (N=2,298)	XDR (N=157)
Not evaluated	10%	12%	21%	22%	21%
Defaulted	7%	13%	20%	15%	6%
Failed	1%	1%	2%	7%	34%
Died	4%	18%	7%	8%	26%
Completed	22%	29%	23%	22%	3%
Cured	54%	28%	26%	25%	10%

New SS+ (HIV-/?): New sputum-smear positive TB cases, HIV-negative or unknown HIV status

New SS+ (HIV+): New sputum-smear positive TB cases, HIV-positive

MDR: Multidrug-resistant TB cases (2009 cohort)

XDR: Extensively drug-resistant TB cases (2008 and 2009 cohort combined

The treatment success rate was even lower in re-treatment TB cases (49%), mainly due to higher default rates in this group (20% vs. 7% in new smear-positive, HIV-negative cases). The treatment success rate was 47% in MDR-TB cases and only 12% in XDR-TB cases. In the latter group, treatment failure (34%) and death (25%) were common (**Figure 23**).

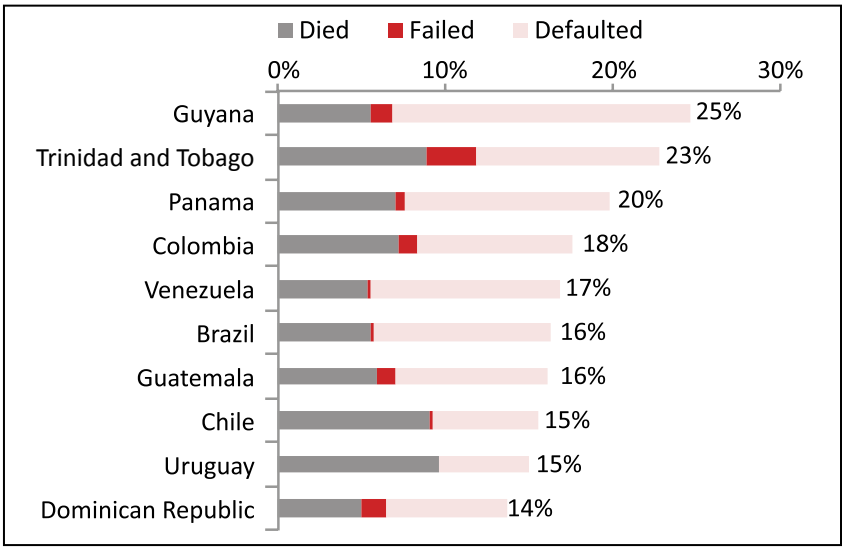
At subregional level, treatment success among new smear-positive TB cases was highest in Mexico and Central America (85%) and lowest in North America (65%) (**Table 5**).[9]

Table 5. New smear-positive treatment outcomes in the Americas (2010 cohort).

Region	Number notified	Number registered	% registered	Cured	Completed	Died	Failed	Defaulted	Not evaluated
North America	4,053	7,888	195%	1.3%	64%	6.3%	0%	1.2%	27%
Caribbean	11,166	11,197	100%	72%	9%	4.9%	1.0%	6.9%	5.4%
Mexico and Central America	20,018	20,175	101%	79%	6.2%	5.8%	1.4%	5.7%	1.7%
South America (Andean)	36,530	36,729	101%	68%	8.0%	3.6%	2.8%	6.6%	11%
South America (others)	45,200	50,448	112%	36%	35%	5.5%	0.3%	10.1%	13%
AMERICAS	**116,967**	**126,437**	**108%**	**53%**	**22%**	**5.0%**	**1.2%**	**7.6%**	**11%**
AFR	601,149	634,962	106%	68%	13%	5.3%	1.3%	5.8%	5.9%
EMR	168,627	169,872	101%	74%	14%	2.4%	1.0%	5.2%	3.0%
EUR	91,324	98,403	108%	54%	13%	8.5%	12%	5.8%	6.8%
SEA	1,047,013	1,045,179	100%	85%	3.5%	3.9%	1.6%	4.6%	1.4%
WPR	628,852	620,772	99%	91%	3.0%	1.9%	0.7%	1.3%	2.5%
World	**2,653,932**	**2,695,638**	**102%**	**79%**	**7.6%**	**3.9%**	**1.6%**	**4.4%**	**3.5%**

At country level, the rate of unfavorable treatment outcomes (i.e. death, failure or default) was highest in Guyana (25%) where almost 18% of new smear-positive TB cases defaulted from treatment, and in Trinidad and Tobago (23%; **Figure 24**)

Figure 24. Top 10 countries by unfavorable treatment outcomes, 2010 cohort of new smear-positive TB cases.
(Countries with a cohort size of less than 100 cases were excluded).



[9] The low treatment success rate among smear-positive TB cases in North America (2009 cohort) is mainly due to a high proportion of treatment outcomes not evaluated or reported for the United States of America by the time this report was produced (see: Table 5).

2.4. Laboratory strengthening

Strengthening of laboratory capacity and performance remains a priority for TB control in the Americas.

Regional targets for the coverage of laboratories for smear microscopy, culture and DST exist (**Box 6**). External quality assurance of laboratories is intended to ensure high quality of laboratory diagnostics.

A total of 23 countries reported data on laboratory capacity and External Quality Assurance (EQA) for 2011, two more than for the previous year. These 23 countries now account for 94% of all estimated incident TB cases in the Region.

Box 6. Region of the Americas: Targets for TB laboratory capacity in the countries

- At least **1** laboratory providing **smear microscopy** per **50,000** to **100,000** population
- At least **1** laboratory providing **culture** testing per **1,000,000** population
- At least **1** laboratory providing **DST** per **5,000,000** population

Smear microscopy

Of all countries reporting data for 2011, only 6 (Belize, Chile, Jamaica, Mexico, Suriname and Uruguay) had less than one laboratory providing smear microscopy available per 100,000 population (**Table 6**). Eight of 23 countries had full EQA coverage for smear microscopy laboratories.

Culture testing

Capacity for culture testing was below target in 9 out of 23 reporting countries (**Table 6**). No laboratory for culture testing was available in Belize. EQA was fully implemented in 11 countries and partially in seven countries (2010: 6 fully and 10 partially).

DST

In 2011, drug-susceptibility testing (DST) was available in most countries reporting data, except for Belize, Jamaica and Suriname. DST capacity was below target in most of the countries (**Table 6**).

National Reference Laboratories

By the end of 2011, National TB Reference laboratories were established in 31 of the 35 countries in the Americas (2010: 29).

New Diagnostics

New diagnostic tools including the WHO endorsed Line Probe Assay and Xpert MTB/RIF for diagnosis of drug-resistant TB are being rolled-out in the Americas. By the end of 2011, the Line Probe Assay was available in laboratories in Bolivia (private sector only), Chile, Colombia, Ecuador, Guyana, Mexico and Uruguay (**Table 7**). The Xpert MTB/RIF was at least partially implemented in Colombia, Costa Rica, Ecuador, El Salvador, Mexico and Uruguay.

Table 6. Laboratory capacity for smear microscopy, culture and DST in the Americas, 2011.

Notes: No data available for countries in North America; highlighted in red: estimates for laboratory below the criteria set for the Region (see: **Box 6**).

				Baciloscopy		Culture		DST	
	Country	Top 10 incident TB cases	Top 10 estimated MDR-TB cases	# labs per 100,000 population	% labs with EQA	# labs per 1 million population	% labs with EQA	# labs per 5 million population	% labs with EQA
Caribbean	Dominican Rep.		Yes	2.3	100%	1.1	100%	0.5	100%
	Haiti	Yes	Yes	2.2	68%	0.2	50%	1.0	50%
	Jamaica			0.1	33%	0.4	100%	0	-
Mexico and Central America	Belize			0.6	0%	0	-	0	-
	Costa Rica			2.3	93%	4.2	100%	1.1	100%
	El Salvador			3.3	100%	3.5	100%	0.8	100%
	Guatemala		Yes	1.8	54%	0.8	42%	1.0	33%
	Honduras			2.1	55%	0.6	20%	0.6	100%
	Mexico	Yes	Yes	0.6	82%	0.6	0%	0.7	50%
	Nicaragua			3.3	87%	0.5	100%	0.9	100%
	Panama			1.5	100%	1.7	17%	1.4	100%
South America (Andean)	Bolivia	Yes	Yes	5.3	92%	4.9	100%	0.5	100%
	Colombia	Yes	Yes	7.8	100%	27	100%	0.5	100%
	Ecuador	Yes	Yes	2.2	100%	1.2	100%	0.3	100%
	Peru	Yes	Yes	5.2	-	2.2	-	1.2	-
	Venezuela	Yes		1.9	40%	0.7	64%	0.2	100%
South America (others)	Argentina	Yes	Yes	1.7	27%	2.5	39%	2.1	47%
	Brazil	Yes	Yes	2.0	33%	1.6	28%	1.1	67%
	Chile			0.9	-	2.3	55%	0.3	100%
	Guyana			2.6	100%	1.3	100%	6.6	100%
	Paraguay			1.8	83%	1.4	100%	0.8	100%
	Suriname			0.6	100%	1.9	0%	0	-
	Uruguay			0.03	100%	0.3	100%	1.5	100%
	TOTAL			**2.4**	**58%**	**3.5**	**77%**	**0.9**	**61%**

2.5. MDR-TB: diagnosis, detection and treatment

Diagnosis, detection and treatment of MDR-TB is one of the top priorities for TB control, internationally and in the Americas. The Global Plan to Stop TB promotes drug susceptibility testing (DST) for all new TB cases considered at high risk of MDR-TB and for 100% of re-treatment cases by 2015. In the Americas, this target is support by the Regional Strategic Plan for TB control, which aims to engage all countries in detecting and treating at least 85% of MDR-TB cases in integrated management within DOTS by the year 2015. Countries are expected to perform DST in at least 20% of new cases and 100% of re-treatment cases.

In order to achieve these aims, a variety of activities have been implemented in the countries of the Americas in the past years. These include strengthening of surveillance, conducting surveys of drug-resistant TB, implementing DST, providing trainings and developing guidelines for the clinical management of drug-resistant TB.

Table 7. Management of MDR-TB and Drug Susceptibility Testing in the Countries of the Americas, 2011.

("-" indicates no data provided).

Country	Top 10 estimated MDR-TB cases	Top 10 estimated % MDR-TB among re-treatment cases	DST		Liquid Culture Testing		Line Probe Assay		Xpert MTB/RIF	
			Included in NTP guidelines	Implemented	Included in NTP guidelines	Implemented	Included in NTP guidelines	Implemented	Included in NTP guidelines	Implemented
Antigua and Barbuda			–	–	–	–	–	–	–	–
Argentina	●	●	✓	✓	✓	✓	✗	✗	✗	✗
Bahamas			–	–	–	–	–	–	–	–
Barbados			–	–	–	–	–	–	–	–
Belize			✓	✓	✗	✗	✗	✗	✗	✗
Bolivia	●	●	✓	✓	✓	✓	✗	✓	✗	✗
Brazil	●	●	✓	✓	✗	✗	✗	✗	✗	✗
Canada			–	–	–	–	–	–	–	–
Chile			✓	✓	✓	✓	✓	✓	✗	✗
Colombia	●	●	✓	✓	✓	✓	✗	✓	✗	✓
Costa Rica			✓	✓	✓	✓	✗	✗	✗	✓
Cuba			–	–	–	–	–	–	–	–
Dominican Republic		●	✓	✓	✓	✓	✗	✗	✗	✗
Ecuador	●	●	✓	✓	✓	✓	✓	✓	✓	✓
El Salvador			✓	✓	✗	✗	✗	✗	✓	✓
Grenada			–	–	–	–	–	–	–	–
Guatemala		●	✓	✓	✓	✓	✗	✗	✗	✗
Guyana			✓	✓	✗	✗	✓	✓	✗	✗
Haiti	●	●	✓	✓	✓	✓	✗	✗	✓	✗
Honduras			✓	✓	✓	✓	✗	✗	✗	✗
Jamaica			✓	✓	✓	✓	✗	✗	✗	✗
Mexico	●	●	✓	✓	✓	✓	✗	✓	✗	✓
Nicaragua			✓	✓	✗	✗	✗	✗	✗	✗
Panamá			✓	✓	✗	✗	✗	✗	✗	✗
Paraguay			✗	✗	✗	✓	✗	✗	✗	✗
Peru	●	●	✓	✓	✓	✗	✗	✗	✗	✗
Puerto Rico			–	–	–	–	–	–	–	–
Saint Kitts and Nevis			–	–	–	–	–	–	–	–
Saint Lucia			–	–	–	–	–	–	–	–
Saint Vincent and the Grenadines			–	–	–	–	–	–	–	–
Suriname			✓	✓	✗	✗	✗	✗	✗	✗
Trinidad and Tobago			–	–	–	–	–	–	–	–
United States	●		–	–	–	–	–	–	–	–
Uruguay			✓	✓	✓	✓	✓	✓	✗	✓
Venezuela	●		✓	✓	✗	✗	✗	✗	✗	✗

Nationwide recent drug-resistance survey data, i.e. data from surveys conducted in the past 10 years, are available from Argentina, Canada, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Peru, Uruguay and United States. Bolivia, Brazil, Mexico and Venezuela conducted surveys between 2009 and 2012, the results of which are being published soon. Nationwide continuous surveillance data exist only from Canada and the United States.

DST coverage

By the end of 2011, conventional DST by solid or liquid culture methods had been implemented by public TB services in at least 25 of the 35 countries in the Region. DST was part of the National TB guidelines in at least 24 countries (**Table 7**). Implementation of new diagnostic tests in priority countries is currently in process (see **2.4.** and **Table 7**).

DST data for the year 2011 were reported by 29 of 35 countries (**Table 8**). Coverage of DST was generally low in the Americas. Among the countries reporting data, test results were available for 11% of laboratory confirmed new TB cases and 19% of notified re-treatment cases only (**Table 8**).

High overall coverage of DST (>80%; regardless of treatment history) was achieved in Canada, the Bahamas, Puerto Rico and the United States. High coverage of DST among re-treatment cases (>80%) was achieved in Bolivia, Chile, Cuba and El Salvador (**Table 8**).

In 2011, DST for second-line drugs was available (inside the country or via another country) in 29 of 35 countries of the Americas.

MDR-/XDR-TB case detection

In 2011, a total of 3,474 MDR-TB cases were detected in the Americas. More than 80% of all MDR-TB cases in the Region were detected in South America, and nearly two-thirds (66%) were detected in Peru and Brazil alone (**Table 8)**.

The 3,474 MDR-TB cases detected represented 58% of the 6,000 MDR-TB cases estimated for the Region in 2011. MDR-TB case detection was very high in North America (112% of estimated) and high in the Andean countries of South America (77%). It was moderate in the other countries of South America (45%) and low in the Caribbean (33%) and in Mexico and Central America (26%).

Figure 24 and **Table 8** provide an overview of MDR-TB case detection at all levels in the Americas.

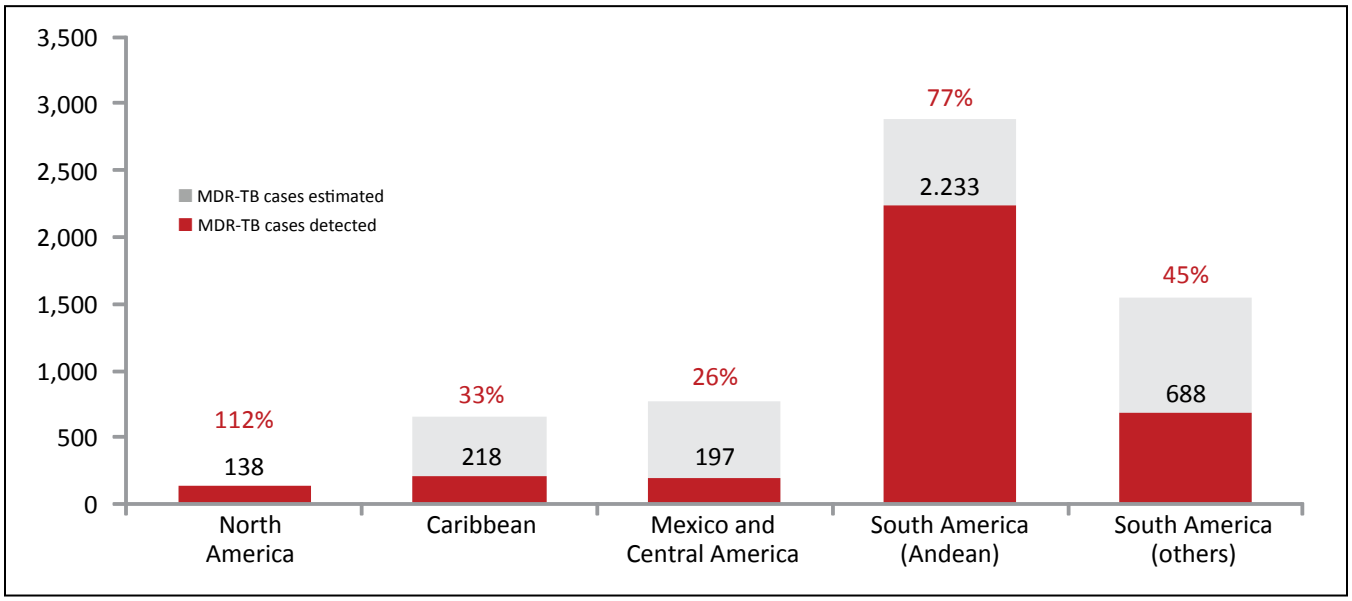
Peru (33), Brazil (23), Argentina (7), Venezuela (4), Dominican Republic (3), Cuba (2), the United States (2), and Canada, Colombia, Ecuador and Mexico (1 each) reported a total of 78 XDR-TB cases in 2011. The number of diagnosed XDR-TB cases more than doubled compared to the previous year (2010: 33 cases).

Second-line treatment

In 2011, a total of 3,086 MDR-TB cases were started on second-line treatment in the Americas, 89% of all MDR-TB cases detected (**Table 9**).

Case detection and/or the number of MDR-TB cases who were started on second-line treatment are still low in some countries with high estimated numbers of MDR-TB cases, highlighting the need to further strengthen MDR-TB case detection and provision of second-line treatment in the Americas.

Figure 25. MDR-TB cases estimated and notified in five subregions of the Americas, 2011.
(Black numbers indicate totals of detected MDR-TB cases; red percentages indicate MDR-TB case detection rate).



2.6. TB/HIV: collaborative activities

Co-infection with HIV remains a major challenge to TB control programs in the Americas. The Regional Strategic Plan aims at strengthening TB/HIV collaborative activities: NTPs are responsible for HIV testing of TB patients and for the provision of co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) to TB patients living with HIV. Where ART cannot be provided within the NTP, patients should be referred to ART services. National HIV/AIDS programs are responsible for intensified TB case finding among people living with HIV and providing isoniazid preventive therapy (IPT) to those without active TB. Close interaction between both programs is therefore necessary.

HIV testing of TB cases

In 2011, around 124,600 TB cases in the Americas had an HIV test done (or knew their HIV status), 54% of all notified TB cases in the Region. HIV testing coverage remained constant compared to 2010 but increased over the past five years (**Figure 26a**). HIV testing coverage was highest in North America and the Caribbean, and it was lowest in the Andean and other countries of South America, where the majority of TB cases were notified in 2011 (**Figure 26b** and **Table 10**).

HIV-positive TB cases

In 2011, around 20,900 TB cases were HIV-positive, 1,200 more than last year (+6.6%). The proportion of HIV-positive results among notified TB cases who were tested or who knew their status was 17% – similar to previous years (**Figure 26a**).

The proportion of notified TB cases that were HIV-positive was highest in the South America - Other subregion and in the Caribbean (each 20%). It was lower in Northern, Mexico and Central America and South America - Andean (**Figure 26b**, **Table 10**).

Table 8. Coverage of drug-susceptibility testing (DST) among notified new and re-treatment TB cases, 2011.

(Countries without DST data shaded in grey. Subregional figures at the bottom include only countries that submitted data).

(Lab+ = laboratory confirmed).

Country/Region	New cases			Re-treatment cases			Unknown history	All cases		
	Notified (Lab +)	DST available	% of notified	Notified	DST available	% of notified	DST available	Notified	DST available	% of notified
Antigua and Barbuda	6	0	0	2	0	0	0	8	0	0
Argentina	5,466	(no data)	-	1.050	(no data)	-	(no data)	6,516	(no data)	-
Bahamas	32	31	97	2	1	50	0	34	32	94
Barbados	0	-	-	-	-	-	0	-	-	-
Belize	64	(no data)	-	12	(no data)	-	(no data)	76	(no data)	-
Bolivia	5,746	98	1.7	637	597	94	(no data)	6,383	695	11
Brazil	42,649	21	0.05	10.045	604	6.0	0	52,694	625	1.2
Canada	749	(no data)	-	81	(no data)	-	1,319	830	1,319	159
Chile	1,483	71	4.8	272	277	102	20	1,755	368	21
Colombia	7,010	2,620	37	842	568	67	93	7,852	3,281	42
Costa Rica	333	32	9.6	26	16	62	0	359	48	13
Cuba	522	313	60	73	76	104	25	595	414	70
Dominican Republic	2,880	12	0.4	505	77	15	28	3,385	117	3.5
Ecuador	3,795	239	6.3	641	284	44	(no data)	4,436	523	12
El Salvador	1,079	238	22	83	69	83	0	1,162	307	26
Grenada	1	(no data)	-	0	-	-	(no data)	1	(no data)	-
Guatemala	1,961	0	0	160	27	17	0	2,121	27	1.3
Guyana	323	2	0.6	233	55	24	0	556	57	10
Haiti	8,011	(no data)	-	423	(no data)	-	(no data)	8,434	(no data)	-
Honduras	2,060	30	1.5	190	65	34	3	2,250	98	4.4
Jamaica	44	28	64	4	1	25	0	48	29	60
Mexico	12,960	6	0.05	1.542	180	12	0	14,502	186	1.3
Nicaragua	1,552	200	12.9	282	67	24	0	1,834	267	15
Panama	1,071	25	2.3	179	40	22	78	1,250	143	11
Paraguay	1,479	227	15	304	93	31	7	1,783	327	18
Peru	18,466	1,199	6.5	3.650	598	16	0	22,116	1,797	8.1
Puerto Rico	40	44	110	0	-	-	1	40	44	110
Saint Kitts and Nevis	1	0	0	0	-	-	0	1	0	0
Saint Lucia	7	2	29	0	-	-	0	7	2	29
Saint Vincent and the Grenadines	8	1	12.5	0	-	-	0	8	1	13
Suriname	73	0	0	11	0	0	0	84	0	0
Trinidad and Tobago	194	(no data)	-	49	(no data)	-	(no data)	243	(no data)	-
United States	6,988	6,899	99	0	-	-	127	6,988	6,899	99
Uruguay	566	422	75	53	38	72	0	619	460	74
Venezuela	3,332	565	17.0	408	195	48	8	3,740	768	21
North America	6,988	6,899	99	-	-	-	1,446	7,818	8,218	105
Caribbean	3,540	431	12	586	155	26	54	4,126	639	15
Mexico and Central America	21,016	531	2.5	2.462	464	19	81	23,478	1,076	4.6
South America (Andean)	38,349	4,721	12	6.178	2.242	36	101	44,527	7,064	16
South America (others)	46,573	743	1.6	10.918	1.067	9.8	27	57,491	1,837	3.2
AMERICAS	116,466	13,325	11	20.144	3.928	19	1,709	137,440	18,834	14

Table 9. MDR-TB cases estimated, detected and enrolled in second-line treatment, 2011.

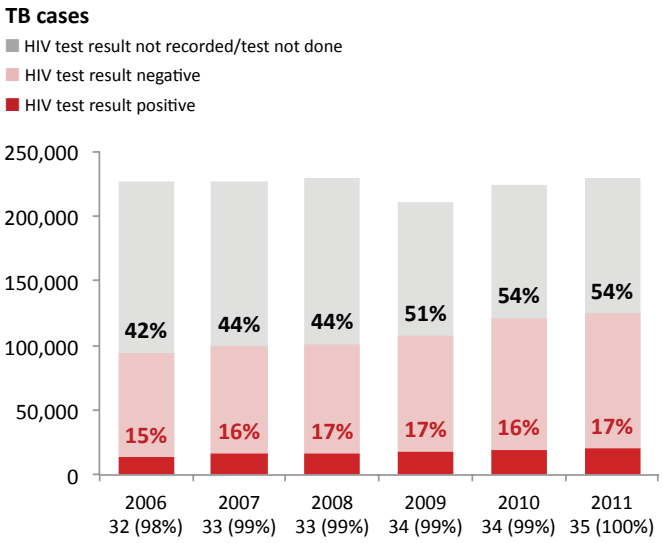
(Countries are sorted by the number of MDR-TB cases estimated among notified TB cases).
(MDR-TB cases detected include those with unknown treatment history).

Country/Region	MDR-TB cases estimated among notified TB cases	MDR-TB case detection		Second-line treatment	
		MDR-TB cases detected	% of estimated	MDR-TB cases treated with second-line drugs	% of detected
Peru	2,100	1,663	79	1,374	83
Brazil	1,100	566	51	630	111
Mexico	470	140	30	140	100
Ecuador	350	354	101	283	80
Argentina	330	103	31	103	100
Dominican Republic	320	117	37	107	91
Haiti	310	86	28	64	74
Colombia	190	108	57	108	100
Bolivia	170	83	49	41	49
Guatemala	120	27	23	27	100
United States	110	119	108	117	98
Venezuela	80	25	31	21	84
Honduras	70	5	7.1	5	100
Paraguay	51	6	11.8	3	50
Panama	46	7	15	7	100
Nicaragua	44	13	30	10	77
Guyana	38	3	7.9	1	33
Chile	20	9	45	7	78
Canada	13	19	146	18	95
Cuba	13	10	77	10	100
Trinidad and Tobago	10	-	-	-	-
El Salvador	8	5	60	4	80
Costa Rica	8	0	0	-	-
Suriname	3	0	0	-	-
Puerto Rico	3	3	103	3	100
Belize	3	0	0	-	-
Jamaica	3	1	39	1	100
Uruguay	2	1	59	1	100
Bahamas	1	1	91	1	100
Saint Vincent and the Grenadines	0	0	-	-	-
Antigua and Barbuda	0	0	-	-	-
Saint Lucia	0	0	-	-	-
Grenada	0	0	-	-	-
Saint Kitts and Nevis	0	0	-	-	-
Barbados	0	0	-	-	-
North America	123	138	112	135	98
Caribbean	660	218	33	186	85
Mexico and Central America	768	197	26	193	98
South America (Andean)	2,890	2.233	77	1,827	82
South America (others)	1,544	688	45	745	108
AMERICAS	5,986	3,474	58	3,086	89

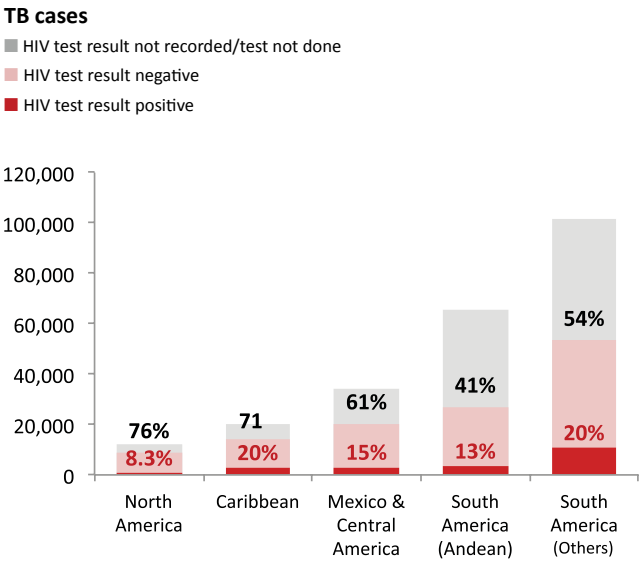
Figures 26 a, b. HIV testing and test results among notified TB cases.

(Bars represent absolute numbers of notified TB cases; black percentages: proportion tested of cases notified; red percentages: proportion HIV-positive of cases tested. Numbers under each year (left) show the number of countries reporting data on HIV testing followed by the percentage of estimated HIV-positive TB cases accounted for by reporting countries).

a) Americas, 2006-2011.



b) Five subregions of the Americas, 2011.



CPT and ART for HIV-positive TB cases

A total of 20 countries reported data for 2011 on the provision of CPT among TB cases living with HIV, accounting for 30% of all HIV-positive TB cases in the Americas. In these countries, 43% of the HIV-positive TB cases received CPT. The proportion of HIV-positive patients provided with CPT seems to be slightly increasing over the past years (**Figure 27**). However, the data need to be interpreted with caution, given the low number of countries reporting data.

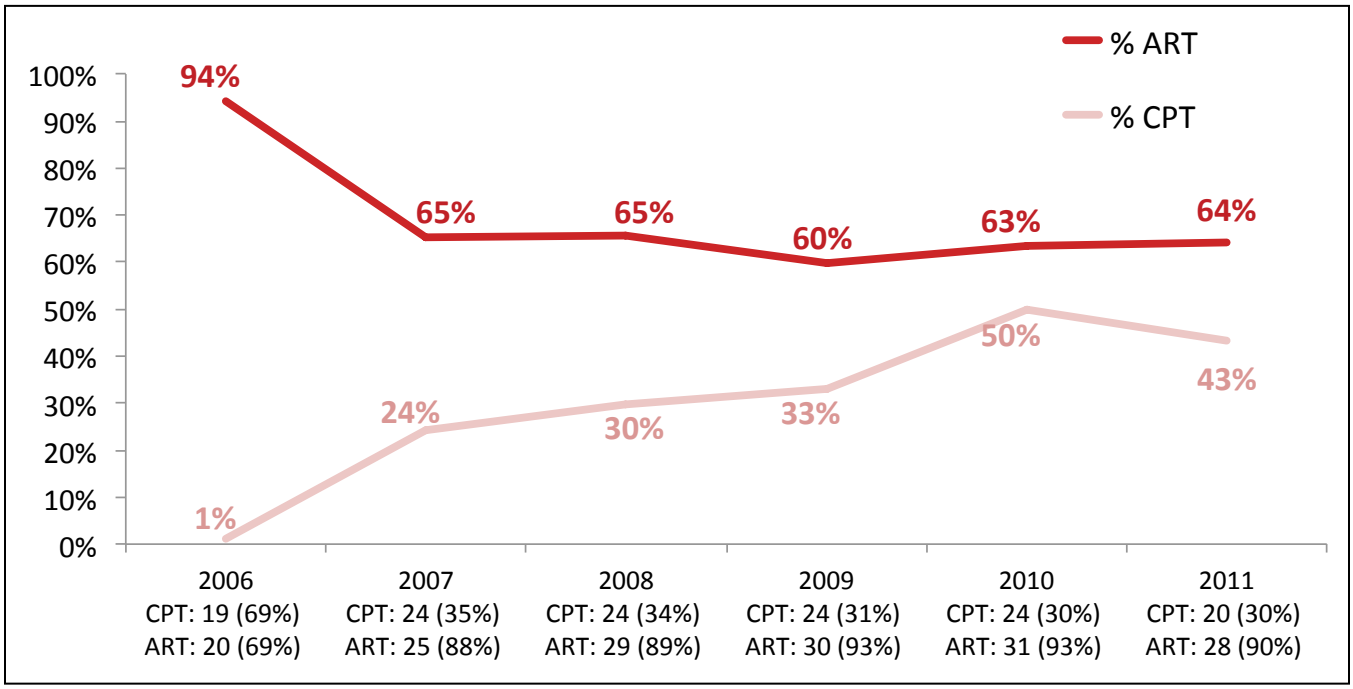
Reporting was more complete for the provision of ART to TB cases living with HIV: data were available for 28 countries, accounting for 90% of all HIV-positive TB cases. In these countries, 64% of all HIV-positive TB cases received ART. The proportion of cases treated was rather constant since 2007 (**Figure 27**). Prior to that year less countries were reporting, the TB/HIV collaborative activities were just beginning to be implemented and the available information was for a limited number of co-infected cases already in treatment.

While some countries, including Brazil (92%), Guatemala (100%), Bolivia (87%) and Guyana (83%) reported high (or complete) coverage of ART treatment, data from most other countries suggest that ART (and CPT) is available only for a small proportion of TB cases living with HIV, or for none (**Table 10**).

Scale-up of CPT and ART provision remains a priority for TB-HIV collaborative activities in the Americas for the forthcoming years.

Figure 27. Provision of CPT and ART among HIV-positive TB cases.

(The numbers under each year show, separately for CPT and HIV, the number of countries reporting data followed by the percentage of total number of HIV-positive TB cases accounted for by reporting countries).



Screening for TB and IPT among people living with HIV

Implementation of intensified TB case finding, IPT and infection control, also known as the "Three I's for HIV/TB", is the preferred strategy suitable for reducing the burden of TB among people living with HIV.

Data from HIV care and ART registers in 23 countries indicate that between 2009 and 2011, at least 62,700 people living with HIV where provided with IPT and 20,000 were screened for TB (**Table 11**).

However, data were inconsistently reported, and interpretations therefore need to be made with caution. Reliable assessment of figures and trends for the current situation and scale-up of IPT and intensified TB case finding among people living with HIV will require better data completeness and improved recording and reporting by countries in the forthcoming years.

Table 10. HIV testing, provision of CPT & ART for HIV-positive TB cases in the Americas, 2011.

(Countries are sorted by the number of HIV-positive TB cases).

		HIV testing		TB/HIV		% of HIV positive TB cases started or continued on CPT	% of HIV positive TB cases started on ART
Country/Region	Notified TB cases	TB cases with an HIV test reult recorded	% of notified	TB cases recorded as HIV positive	% of tested		
Brazil	84,137	49,091	58	9,575	20	(no data)	92
Peru	32,844	7,052	21	960	14	(no data)	2.2
Mexico	20,528	10,599	52	1,985	19	64	28
Haiti	14,361	10,461	73	2,025	19	12	17
Colombia	11,984	6,579	55	1,292	20	(no data)	36
United States	10,521	8,527	81	671	7.9	(no data)	(no data)
Argentina	10,651	1,053	10	559	53	(no data)	(no data)
Bolivia	8,747	4,118	47	138	3.4	(no data)	87
Venezuela	6,477	4,033	62	519	13	(no data)	32
Ecuador	5,350	5,350	100	576	11	(no data)	(no data)
Dominican Republic	4,472	2,540	57	648	26	41	66
Honduras	3,243	2,256	70	255	11	31	71
Guatemala	3,088	2,125	69	260	12	100	100
Nicaragua	2,822	1,552	55	16	1.0	(no data)	(no data)
Paraguay	2,549	1,520	60	174	11	25	56
Chile	2,535	259	10	120	46	(no data)	(no data)
El Salvador	1,917	1,878	98	194	10	85	77
Panama	1,695	1,534	91	245	16	65	48
Canada	1,452	529	36	77	15	(no data)	(no data)
Guyana	916	852	93	199	23	94	83
Cuba	821	780	95	69	8.8	30	80
Uruguay	817	741	91	110	15	0	31
Costa Rica	524	498	95	47	9.4	0	0
Trinidad and Tobago	266	250	94	83	33	20	36
Suriname	131	118	90	38	32	18	53
Jamaica	108	88	81	15	17	(no data)	93
Belize	76	64	84	24	38	(no data)	100
Puerto Rico	50	45	90	9	20	(no data)	(no data)
Bahamas	42	42	100	12	29	42	67
Saint Vincent and the Grenadines	17	16	94	5	31	(no data)	60
Antigua and Barbuda	8	8	100	5	63	40	100
Saint Lucia	7	7	100	1	14	0	100
Grenada	2	2	100	0	0	-	-
Saint Kitts and Nevis	1	1	100	0	0	-	-
Barbados	0	0	-	0	-	-	-
North America	11,973	9,056	76	748	8.3	(no data)	(no data)
Caribbean	20,155	14,240	71	2,872	20	20	31
Mexico and Central America	33,893	20,506	61	3,026	15	65	43
South America (Andean)	65,402	27,132	41	3,485	13	(no data)	27
South America (others)	101,736	53,634	53	10,775	20	46	91
AMERICAS	233,159	124,568	53	20,906	17	43	64

Table 11. IPT and intensified TB case finding in countries of the Americas, 2009-2011.
(Note: Not all countries reported data for each of the three years).

Country	2009-2011 (combined)	
	HIV-positive people provided with IPT	HIV-positive people screened for TB
Antigua and Barbuda	1	5
Barbados	5	0
Brazil	8,668	0
Costa Rica	41	0
Cuba	2,857	4,356
Dominican Republic	5,041	5,863
Ecuador	390	0
El Salvador	359	552
Granada	24	0
Guatemala	549	250
Guyana	1,736	425
Haiti	6,154	4,112
Honduras	1,154	123
Mexico	2,368	676
Nicaragua	902	677
Panama	0	196
Paraguay	504	0
Peru	0	2,544
Puerto Rico	4	0
Saint Lucia	36	0
Saint Vincent and the Grenadines	16	1
Trinidad and Tobago	1,698	15
Venezuela	30,158	204
TOTAL	62,665	19,999

2.7. Strengthening of TB control: training and capacity building

During 2012 PAHO's Regional TB Program conducted and co-sponsored several activities aimed at developing or strengthening capacity on TB control in countries. Some of these activities were conducted directly by PAHO and others in collaboration with partner organizations. Most were funded with WHO, USAID and the Spanish Cooperation funding.

Among specific training activities, the following courses and workshops were conducted during 2012::

- XXI International Course on TB Epidemiology and Control - San Salvador, El Salvador – 23 to 31 March (26 participants from 9 countries).
- Regional Workshop on Strengthening Drug Management for 2nd Line Anti-TB Drugs – Belize City, Belize – 17 to 20 April (29 participants from 15 countries).
- IX International Course on the Clinical and Operational Management of Drug Resistant Tuberculosis – Santo Domingo, Dominican Republic – 14 to 18 May (15 participants from 9 countries).

- Workshop on TB drug quality control – Montevideo, Uruguay – 3 to 7 September (10 participants from 5 countries).

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

- Meeting of the PAHO/WHO TB Laboratory Working Group of the Americas (6 August), Meeting of National and Supranational TB Laboratories (7 August) and Regional Meeting of National TB Program Managers (7 to 10 August) – São Paulo, Brazil.

- Technical assistance missions on TB infection control with emphasis on environmental aspects to Argentina (5 to 14 September), Colombia (17 to 25 September) and Honduras (24 to 28 September) in which local engineers and architects were mentored.

Some participants to these trainings, workshops and meetings 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.

CHAPTER 3:
Progress towards Global Targets for Reductions in Disease Burden

The purpose of this chapter is to provide a recent update on the progress in the Americas towards the global targets for TB control specified in the Millennium Development Goal (MDG) 6 and the Global Plan to Stop TB 2011-2015 (**Table 12**).

On the basis of pre-defined progress categories (**Table 13**), the chapter summarizes the current progress towards the global targets at the country, subregional and regional levels. (**Table 14**).

TABLE 12. International Targets for TB control.

(Source: Stop TB Partnership).

Millennium Development Goal (MDG) 6: Relevant targets and indicators	Stop Tuberculosis Targets linked to the MDG
MDG 6: Combat HIV/AIDS, malaria and other Diseases Target 6c: To have halted by 2015 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 (disease prevalence and deaths) will be reduced by 50% relative to their 1990 levels. DOTS: Case detection rate (CDR; for all cases) will be 90% and treatment success rate will be 90%.[10] By 2050: The global incidence of TB disease will be less than 1 case per million population per year.

Table 13. Overview of indicators and categories used for assessing the progress towards the global targets for TB control.

Goal/Target	Having met the target	Considerable progress	Limited or uncertain progress	No progress
Incidence MDG 6, target 6c	Statistically significant decline in TB incidence between 2006 and 2010.	No data	Constant or statistically not significant decline/increase in TB incidence between 2006 and 2010.	Statistically significant increase in TB incidence between 2006 and 2010.
Prevalence Stop TB target for 2015 MDG 6, indicator 6.9	TB prevalence in 2010 is half (50%) or less that that of 1990.	The prevalence in 2010 is greater than 50% but lower than 75% of that in 1990.	TB prevalence in 2010 is between 75% and 99% of that in 1990.	TB prevalence in 2010 is equal to (100%) or greater than that in 1990.
Mortality Stop TB target for 2015 MDG 6, indicator 6.9	TB mortality in 2010 is half (50%) or less than that of 1990.	TB mortality in 2010 is greater than 50% but lower than 75% of that in 1990.	TB mortality in 2010 is between 75% and 99% of that in 1990.	TB mortality in 2010 is equal (100%) or greater than that in 1990.
Case detection Stop TB target for 2015 MDG 6, indicator 6.10	The case detection rate for all cases in 2010 is equal or greater than 90%.	The case detection rate for all cases in 2010 is between 70% (2005 target) and 89%.	The case detection rate for all cases in 2010 is between 50% and 69%.	The case detection rate for all cases is below 50%.
Treatment success Stop TB target for 2015 MDG 6, indicator 6.10	The treatment success rate of new smear-positive TB cases in 2010 is equal or greater than 90% (2009 cohort).	The treatment success rate for new smear-positive TB cases in 2010 is between 80% and 89% (20009 cohort).	The treatment success rate for new smear-positive TB cases in 2010 is between 60% and 79% (2009 cohort).	The treatment success for new smear-positive TB cases in 2010 is below 60% (2009 cohort).

[10] For the updated Global Plan to Stop TB 2011-2015, the target for treatment success has been updated from 87% to 90%. The case detection rate for all forms of TB is no longer used as a global target. (See: Global Plan to Stop TB; full text available at: http://www.stoptb.org/assets/documents/global/plan/TB_GlobalPlanToStopTB2011-2015.pdf - last accessed: Feburary 2013). The 2015 target for case detection rate of 90% is used specifically by the PAHO for the Americas.

3.1. TB incidence

MDG 6, target 6c

In the time between 2007 and 2011, TB incidence has been constantly decreasing at an average annual rate of 3.1% in the Americas as a whole, and between 1.4% and 5.7% in the five subregions (**Table 14**). At country level, incidence has been declining in 19 of 28 countries evaluated.[11] Limited or uncertain progress was made in 7 countries. No progress was made in Trinidad and Tobago (3.0% annual increase) and in Cuba (0.9% annual increase). However, estimated TB incidence in 1990 was relatively low in both countries (**Table 14**).

3.2. TB prevalence

MDG 6, Indicator 6.9 and Stop TB target for 2015

Overall, there is a continuous decline in TB prevalence in the Americas. In 2011, TB prevalence was less than 50% of the 1990 estimate in all subregions, except for the Caribbean (65%), where at least considerable progress was made. At country level, limited or no progress towards the target was made in six of 28 countries (**Table 14**).

3.3. TB mortality

MDG 6, Indicator 6.9 and Stop TB target for 2015

TB associated mortality in HIV-negative TB cases continues to decline in the Americas (see also **Figure 7**). In 2011, the target to halve TB mortality compared to 1990 was met in all subregions except for the Caribbean where limited progress was made. At country level, limited or no progress was made in five of the 28 countries (**Table 14**).

3.4. Case detection

MDG 6, Indicator 6.10 and Stop TB target for 2015

By 2011, The Americas has not yet met the target for case detection (84% vs. 90%). Limited progress was made in the Caribbean. At country level, limited or no progress was made in nine of the 28 countries (**Table 14**).

3.5. Treatment success

MDG 6, Indicator 6.10 and Stop TB target for 2015

By 2011, only limited progress towards the target for treatment success among new smear-positive TB cases was made in the Americas – mainly due to the low treatment success rate in South America. Only limited progress was made in 12 countries (**Table 14**). Treatment success rates were particularly low in Jamaica (47%) and Argentina (48%) because the number of treatment outcomes not evaluated and/or not reported was high in both countries.

[11] The progress in Antigua and Barbuda, Bahamas, Barbados, Grenada, Saint Kitts and Nevis, Saint Lucia and Saint Vincent and the Grenadines was not classified due to very low numbers of TB cases and relatively small populations.

Table 14. Overview of regional, subregional and country progress towards the targets for TB control in 2011.

Remarks:
Percent annual change in TB incidence: "-" denotes that annual change 2007-2011 was not statistically significant.
Abbreviations: TSR=Treatment success rate; CDR=Case detection rate
The progress in Antigua and Barbuda, Bahamas, Barbados, Grenada, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines was not classified due to very low numbers of cases.

	Incidence			Prevalence			Mortality			Case detection	Treatment success
Goal	Halt and reverse TB incidence by 2015			Halve TB prevalence rate, from 1990 to 2015			Halve TB mortality rate, from 1990 to 2015			Detect 90% of TB cases	Successfully treat ≥ 90% of new smear-positive TB cases
Country	**Incidence 2007**	**Incidence 2011**	**% annual change**	**Prevalence 1990**	**Prevalence 2011**	**% of 1990**	**Mortality 1990**	**Mortality 2011**	**% of 1990**	**CDR (%) 2010**	**TSR (%) 2009**
Antigua and Barbuda	4.4	6.9	**11**	3.7	5.3	**143**	0.1	1.0	707.1	**97**	**33**
Argentina	31	26	**-4.6**	95	36	**38**	4.0	1.4	35	**90**	**48**
Bahamas	16	13	**-5**	19	14.0	**74**	0.6	0.6	114	**90**	**68**
Barbados	4.1	-	**-**	3.1	-	**-**	0.1	0.6	786	**(no data)**	**100**
Belize	40	40	**-**	50	41	**82**	4.1	4.3	105	**58**	**(no data)**
Bolivia	148	131	**-3.1**	380	205	**54**	36	21	58	**64**	**88**
Brazil	48	42	**-3.3**	123	46	**37**	5.3	2.9	55	**91**	**74**
Canada	5.1	4.5	**-2.9**	11	5.6	**51**	0.5	0.2	33	**89**	**76**
Chile	19	18	**-**	91	24	**26**	6.8	1.3	19	**79**	**71**
Colombia	37	34	**-2.3**	78	43	**55**	6.4	1.9	30	**73**	**79**
Costa Rica	19	12	**-11.1**	112	15	**13**	2.8	0.7	26	**88**	**87**
Cuba	9.0	9.3	**0.9**	58	12	**21**	0.6	0.3	44	**77**	**89**
Dominican Republic	76	65	**-4.0**	302	83	**27**	14	6.1	44	**66**	**80**
Ecuador	76	62	**-5.1**	325	98	**30**	22	4.6	21	**56**	**79**
El Salvador	33	27	**-5.3**	90	31	**34**	5.7	1.1	19	**110**	**91**
Grenada	4.2	4.1	**-**	11	5.1	**46**	0.3	1.1	367	**47**	**75**
Guatemala	63	61	**-0.8**	134	111	**83**	11.0	2.4	22	**34**	**83**
Guyana	114	110	**-0.9**	174	121	**70**	9	27	293	**85**	**71**
Haiti	256	222	**-3.5**	329	307	**93**	31	30	97	**64**	**82**
Honduras	73	43	**-13**	174	49	**28**	6	3.1	48	**96**	**85**
Jamaica	6.5	6.6	**-**	8.5	8.8	**104**	1.1	0.2	22	**58**	**47**
Mexico	22	23	**-**	140	28	**20**	9	1.7	19.5	**76**	**87**
Nicaragua	49	40	**-5.0**	171	50	**29**	11	3.2	29	**110**	**85**
Panama	47	48	**-**	67	56	**84**	8	6.1	73	**91**	**80**
Paraguay	48	45	**-1.7**	92	59	**64**	3.7	2.6	70	**79**	**78**
Peru	126	101	**-5.6**	522	117	**22**	35	7.4	21	**110**	**68**
Puerto Rico	2.8	1.8	**-11**	8.0	2.0	**25**	1.8	0.5	27	**74**	**78**
Saint Kitts and Nevis	5.2	5.5	**-**	0.3	7	**2,448**	0.1	2.7	3,375	**34**	**100**
Saint Lucia	10	5.1	**-16.7**	20	6	**30**	3.7	1.9	51	**78**	**89**
St. Vincent and the Grenadines	25	24	**-**	66	30	**45**	1.2	1.6	133	**64**	**(no data)**
Suriname	56	44	**-6.0**	94	51	**54**	3.5	2.7	77	**53**	**60**
Trinidad and Tobago	19	21	**3.0**	13	22	**169**	2.3	2.2	96	**78**	**76**
United States of America	4.9	3.9	**-5.7**	15	4.7	**31**	0.7	0.1	19	**86**	**64**
Uruguay	22	21	**-**	31	23	**74**	2.6	1.6	62	**110**	**85**
Venezuela	34	33	**-**	49	48	**98**	5.5	2.3	42	**64**	**83**
North America	5.0	3.9	**-5.7**	15	4.9	**33**	0.7	0.1	**20**	**92**	**65**
Caribbean	86	75	**-3.4**	157	103	**65**	10	9.2	**90**	**65**	**82**
Mexico and Central America	30	28	**-1.4**	139	38	**27**	9	2.0	**23**	**71**	**85**
South America (Andean)	68	60	**-3.5**	223	79	**35**	17	5.0	**29**	**80**	**75**
South America (others)	43	38	**-3.1**	113	44	**39**	5.2	2.6	**50**	**86**	**71**
AMERICAS	32	28	**-3.1**	95	36	**38**	5.7	2.2	**39**	**80**	**75**

CHAPTER 4:
Financing Tuberculosis Control

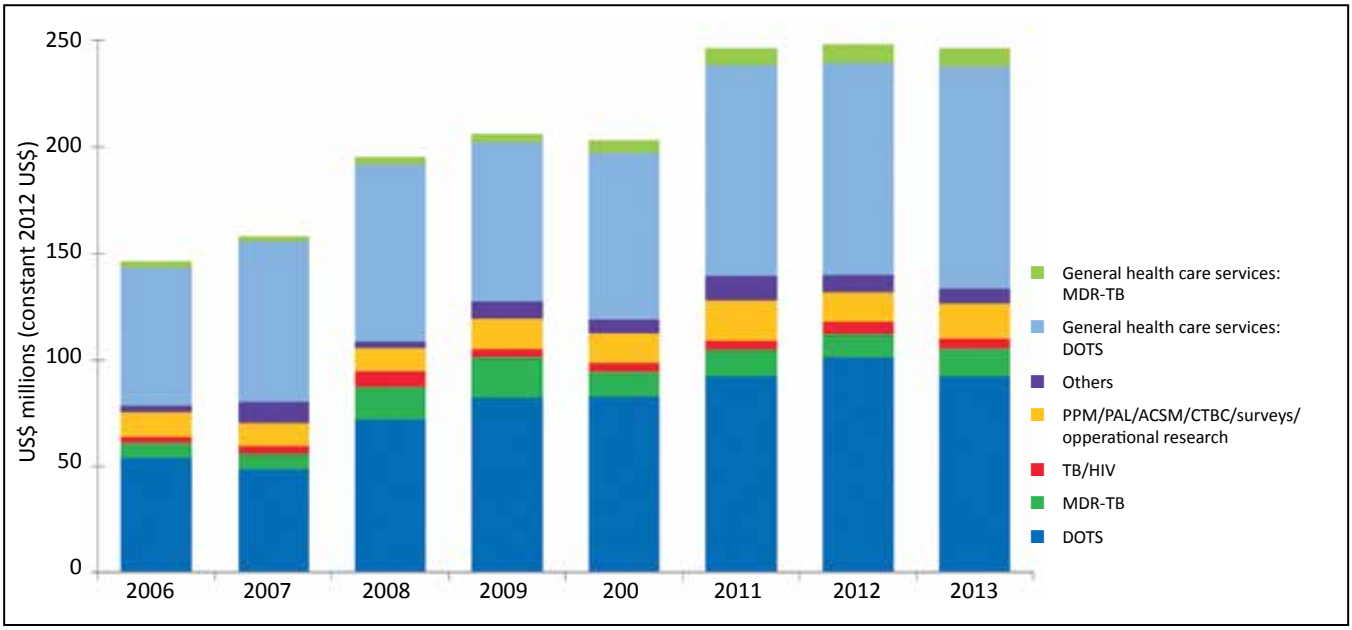
Adequate funding is essential for progress in TB prevention, care and control. Since 2002, WHO monitors funding for TB in all countries. The global TB database holds the financial data reported from 2002 up to 2013; it includes the NTP budget, NTP expenditures and the use of general health services. Data compiled to date allows assessment in trends of funding for TB control for 2002-2013 for the 22 global high-burden TB countries, to which Brazil belongs. For the other countries in the World, the quality of the data allows assessment of trends for the period 2006-2013. In this chapter we analyse and present the funding for TB control for the Region of the Americas, particularly for 15[12] selected countries, which together account for about 72% 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 are broken down by category of expenditure (**Section 4.1**), by sources of funding (**Section 4.2**), highlighting variations in countries' reliance on donor funding, and are compared with total government expenditures on health care. **Section 4.3** presents estimates of the cost per patient treated with first-line drugs, which are also compared with gross national income per capita. Section 4.4 describes the trends in available funding and funding gaps reported by countries.

4.1. Funding for TB care and control by category of expenditure, 2006-2013

Funding for TB care and control is expected to reach US$ 246 million in 2013 in the 15 selected countries of the Region. The largest share of funding, in each year, has been for the diagnosis of TB and treatment with first-line drugs; in **Figure 28** this means all categories of expenditure except MDR-TB and general health-care services for MDR-TB (i.e. DOTS, TB/HIV, PPM, PAL, CTBC, ACSM, Surveys, operational research and the use of general health services by drug-susceptible TB cases). Funding for diagnosis of TB and treatment with first-line drugs has reached about US$ 225 million in these 15 countries in 2013 up from US$ 137 million in 2006. Funding for MDR-TB is expected to be around US$ 21 million in 2013, up from US$ 10 million in 2006.

Figure 28. Available funding for TB care and control by category of expenditure, 15 selected countries, 2006-2013.
DOTS includes the funding available for first-line drugs, NTP staff, program management and supervision, and laboratories.



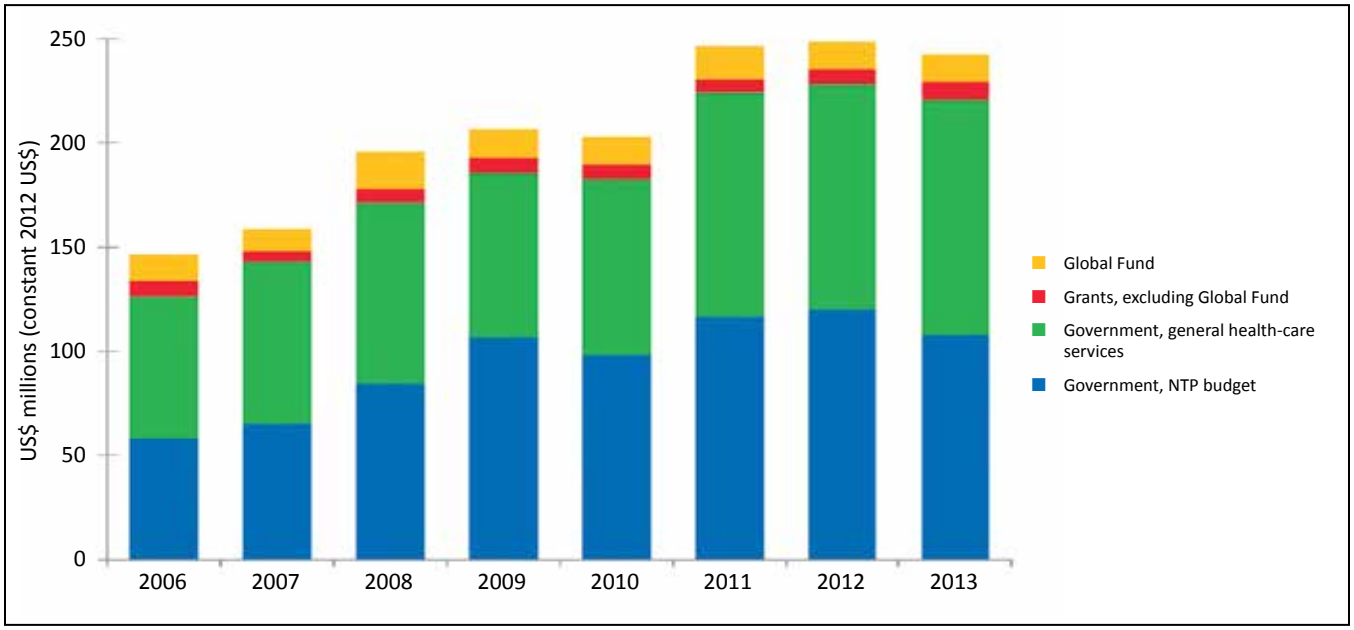
[12] The 15 countries are: Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama and Paraguay.

An important share of the funding has been used to support the general use of health care services by TB and MDR-TB patients; these are costs associated with using general health-service staff resources and infrastructure for TB control, both of which are used when TB (and MDR-TB) patients are hospitalized or visit outpatient facilities for DOT or monitoring tests during treatment[13].

4.2 Funding for TB care and control by source of funding, 2006–2013

Domestic funding from national governments is the single largest source of funding for TB care and control (**Figure 29, Table 15**), accounting for 90% of total expected funding in 2013[14] in the Region of the Americas, the same pattern is seen worldwide. The other 10% is expected to come from donor sources, most of it (60%, equivalent to US$ 12 million) is accounted by grants from the Global Fund.

Figure 29. Available funding for TB care and control by source of funding, 15 selected countries, 2006-2013.



[13] In most countries the costs for outpatient visits and inpatient care in hospitals are not included in the NTP budgets. We estimate these costs based on the inputs of using health care services reported by countries: 1) the average number of outpatient visits for DOT or monitoring tests during treatment, and 2) the average number of days in hospital per TB (and MDR-TB) patient. These inputs are then multiplied by the WHO estimates of unit costs of outpatient visits and bed-days (see www.who.int/choice) to obtain the cost of the general use of health care services.

[14] Domestic funding includes loans and funding for outpatient visits and inpatient care in hospitals for TB and/or MDR-TB patients.

Table 15. 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.[a]

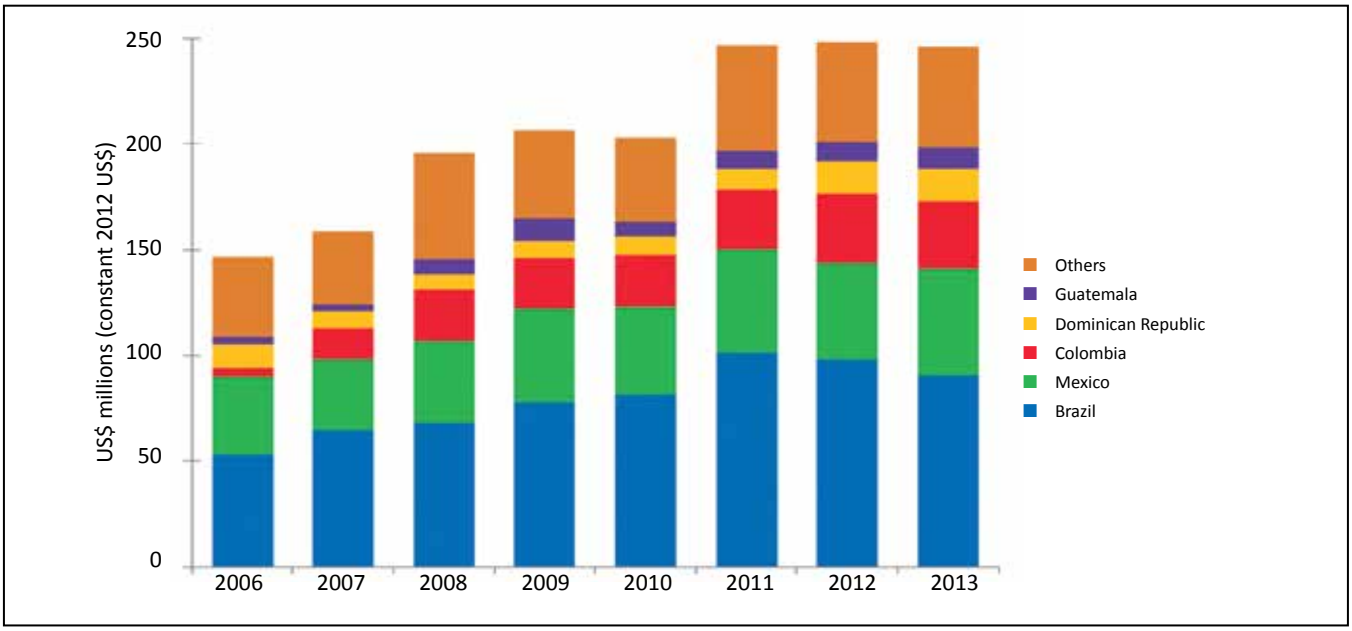
Country	Funding available				Gap	Cost of use of general health-care services (estimation)[b]	Total costs for TB care and control[c]	% of domestic funding in NTP budget	% of domestic funding in total funding available
	NTP budget	Government (including loans)	Grants (exluding Global Fund)	Global Fund					
Brazil	85	70	0.1	0	15	22	107	82	100
Mexico	15	15	0	0	0	35	50	100	100
Colombia	12	6.8	0	2.4	2.5	23	34	58	92
Dominican Republic	14	7.5	0.1	3.1	2.8	4.7	18	56	79
Bolivia	4.9	0.6	0	1.9	2.4	4.8	9.7	12	74
Ecuador	6.3	6.3	0	0	0	2.1	8.4	100	100
El Salvador	6.9	3.9	0	0	3.0	1.3	8.2	57	100
Haiti	6.8	0.5	0.4	1.3	4.6	0.5	7.3	7	37
Paraguay	4.0	1.5	0	1.1	1.4	2.8	6.8	38	80
Panama	0.6	0.6	0	0	0	4.1	4.7	100	100
Jamaica	0.2	0.2	0	0	0	1.1	1.3	100	100
Chile	–	–	–	–	–	5.9	5.9	–	–
Guatemala	–	–	–	–	–	2.7	2.7	–	–
Honduras	–	–	–	–	–	1.5	1.5	–	–
Nicaragua	–	–	–	–	–	1.3	1.3	–	–
Total[d]	155	113	1	10	12	113	268	73	96

Notes:
– Data are not available or are incomplete.
[a] Data can differ from those presented in other figures as they have not been adjusted to constant 2012 US$.
[b] Please refer to footnote 2, it explains the method of estimation.
[c] Calculates as the NTP budget plus the cost of use of general health-care services.
[d] This total does not include estimates for Chile, Guatemala, Honduras, and Nicaragua.

Funding from donors (Global Fund and others) has been around US$ 20 million in each year 2006-2013 in these 15 countries of the Region. Nevertheless, regional data on sources of funding conceal important variation in the extent to which countries rely on domestic and donor financing. In low-income countries, such as Haiti, donor funding has exceeded domestic funding since 2006, and data reported suggest that this will persist in 2012 and 2013. In middle income countries in general domestic funding has exceeded donor funding.

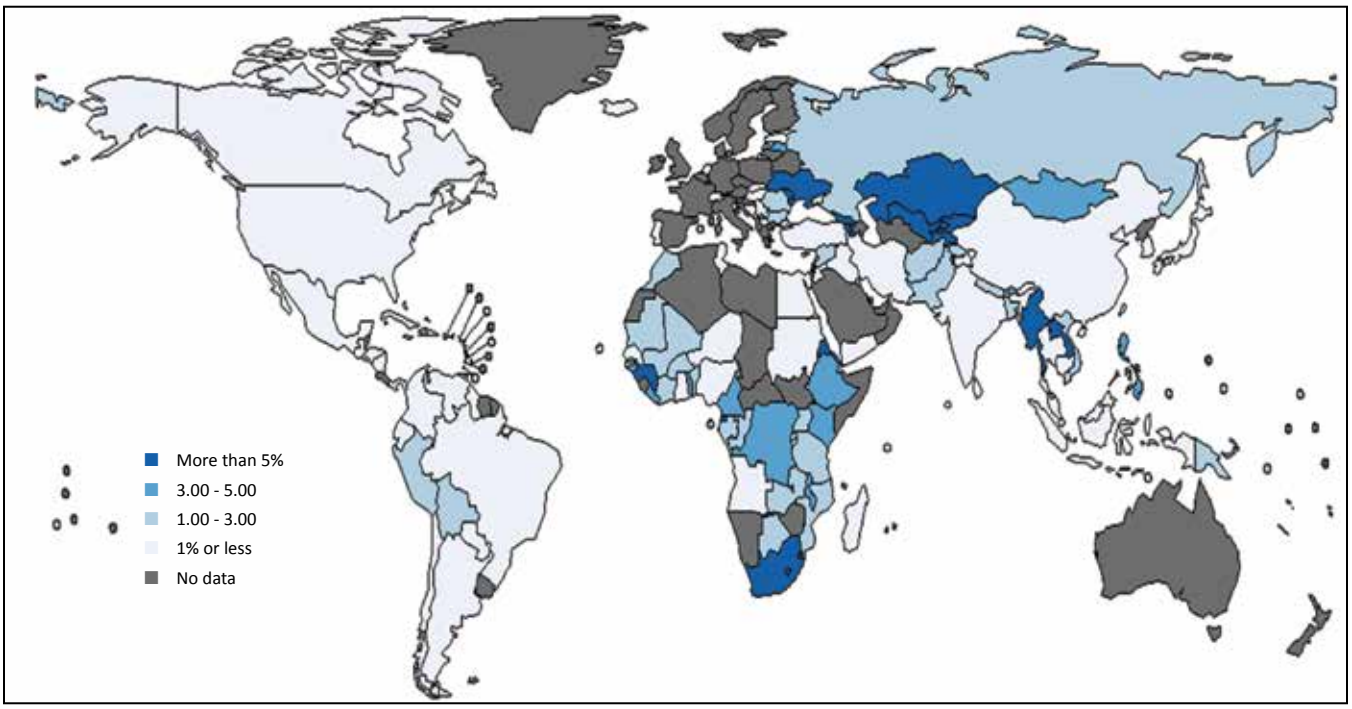
In total, 80% of the funding expected for TB in these 15 countries is accounted for by five countries: Brazil, Colombia, Dominican Republic, Guatemala and Mexico (**Figure 30**), which together account for about 52% of all notified cases in the Region in 2011. Funding expected in the remaining 10 countries, which account for 20% of notified cases in the Region in 2011, amounts to US$ 47 million, equivalent to 19% of total funding for these 15 countries.

Figure 30. Available funding for TB care and control by country, 15 selected countries, 2006-2013.



Estimates indicate that for most countries in the Region of the Americas spending on TB control is a very low proportion of public health expenditures, less than 1% (**Figure 31**).

Figure 31. Expenditures for TB care and control as a percentage of public sector health expenditures, average 2007-2009.[15]

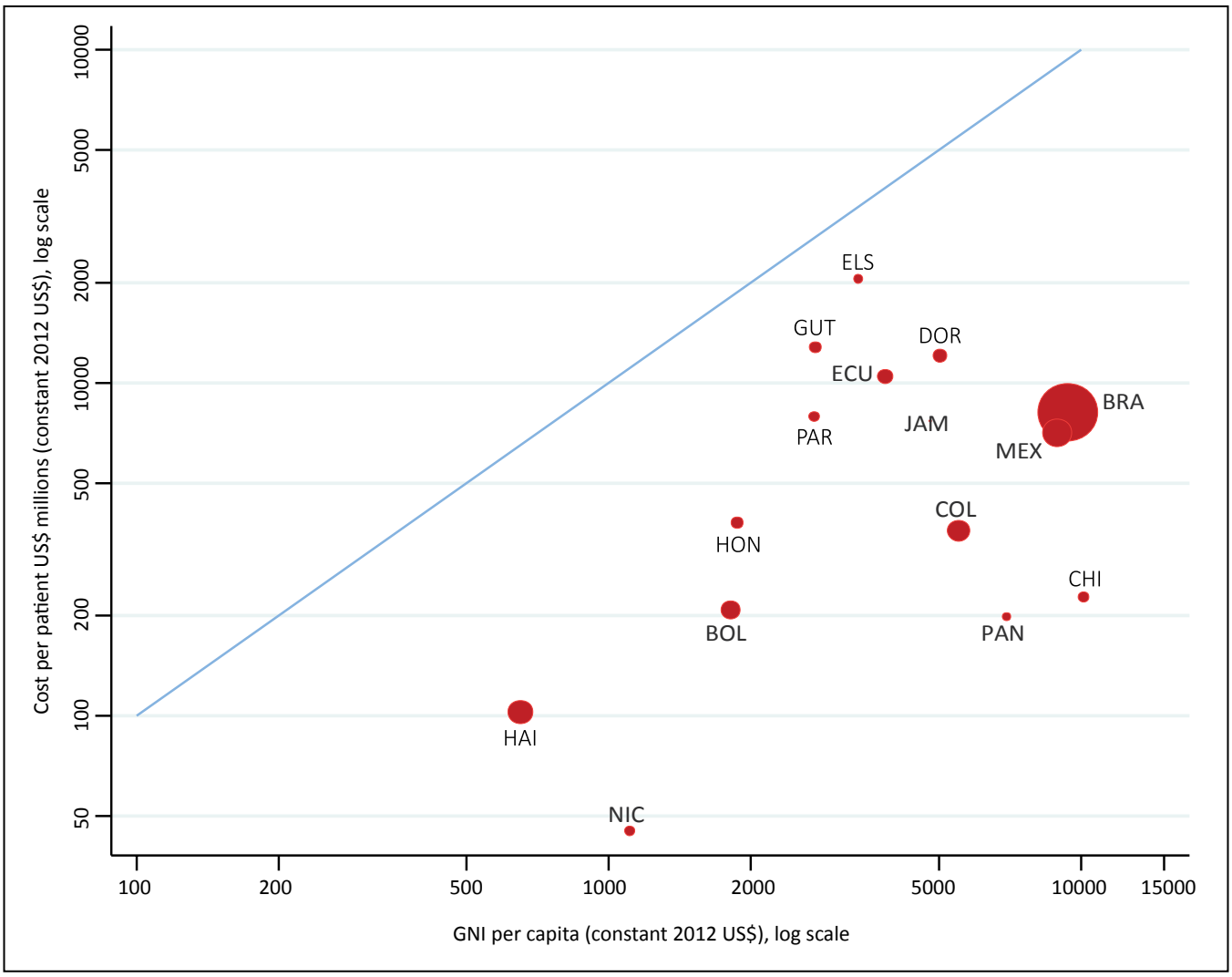


[15] This map was originally presented in the Global TB Report 2012 (http://who.int/tb/publications/global_report/gtbr12_main.pdf), it is reproduced here with the authorization of WHO/STB/TME. At the time of the analysis of the Global TB Report, the latest available data for public sector health expenditures were from 2009; there is however little change in this indicator from one year to another.

4.3. Cost per patient treated for TB

The estimated cost per patient treated for TB with first-line drugs is shown for each of the 15 selected countries in **Figure 32**. Nicaragua and Haiti present the lowest average cost at less than US$ 100, and El Salvador the highest at around US$ 2000. The cost per patient treated for the other countries lies in the range US$ 200 – US$ 1200.

Figure 32. Cost per TB patient treated with first-line drugs, 15 selected countries, 2011.



Notes:

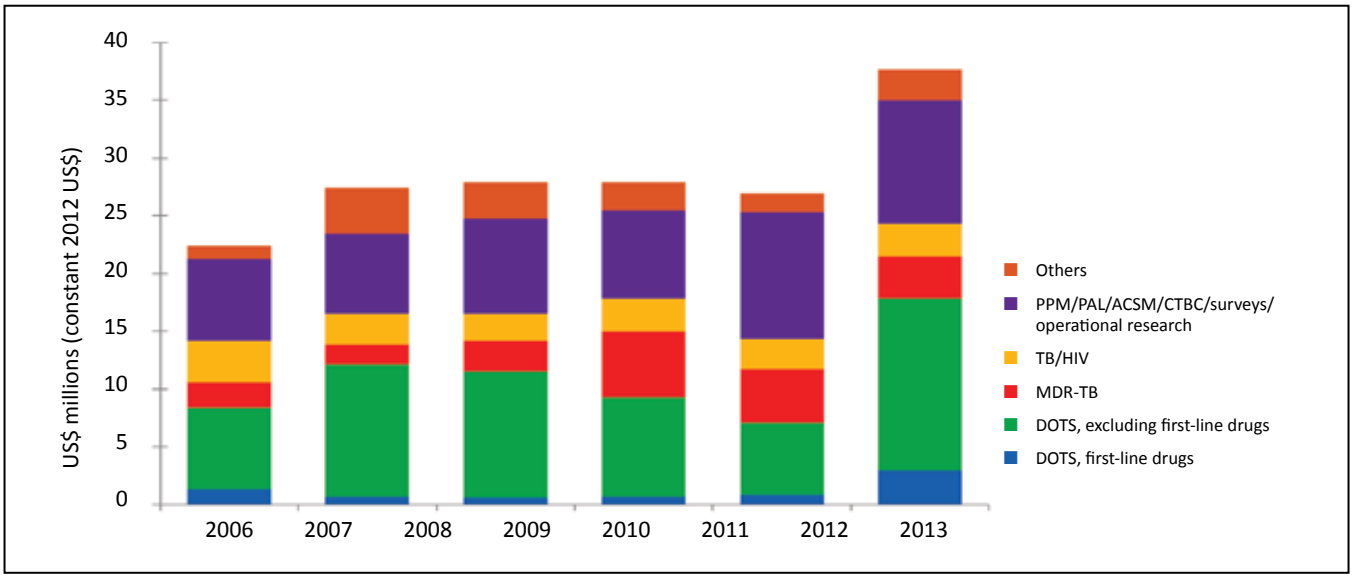
1) The blue line marks where cost per patient treated equals GDP per capita.
2) Costs include first-line drugs, NTP staff, programme management and supervision, laboratory equipment and supplies, collaborative TB/HIV activities, PPM, PAL, ACSM, CBC, operational research, surveys, hospital stays and clinic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

In all of the 15 selected countries the cost per patient treated is less than GDP per capita[16] (that is, all values lie below the solid blue line in **Figure 32**)[17]. Although the cost per patient 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 32**). 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.

4.4 Trends in funding and funding gaps reported by countries

Though funding for TB has increased since 2007 and there are now 10 completed rounds of proposals to the Global Fund, NTPs continue to report funding gaps. During the period 2008-2012 funding gaps were between US$ 23-27 million (**Figure 33**). However, in 2013 the funding gap will reach US$ 38 million.

Figure 33. Funding gaps by category of expenditure, 15 selected countries, 2008-2013.



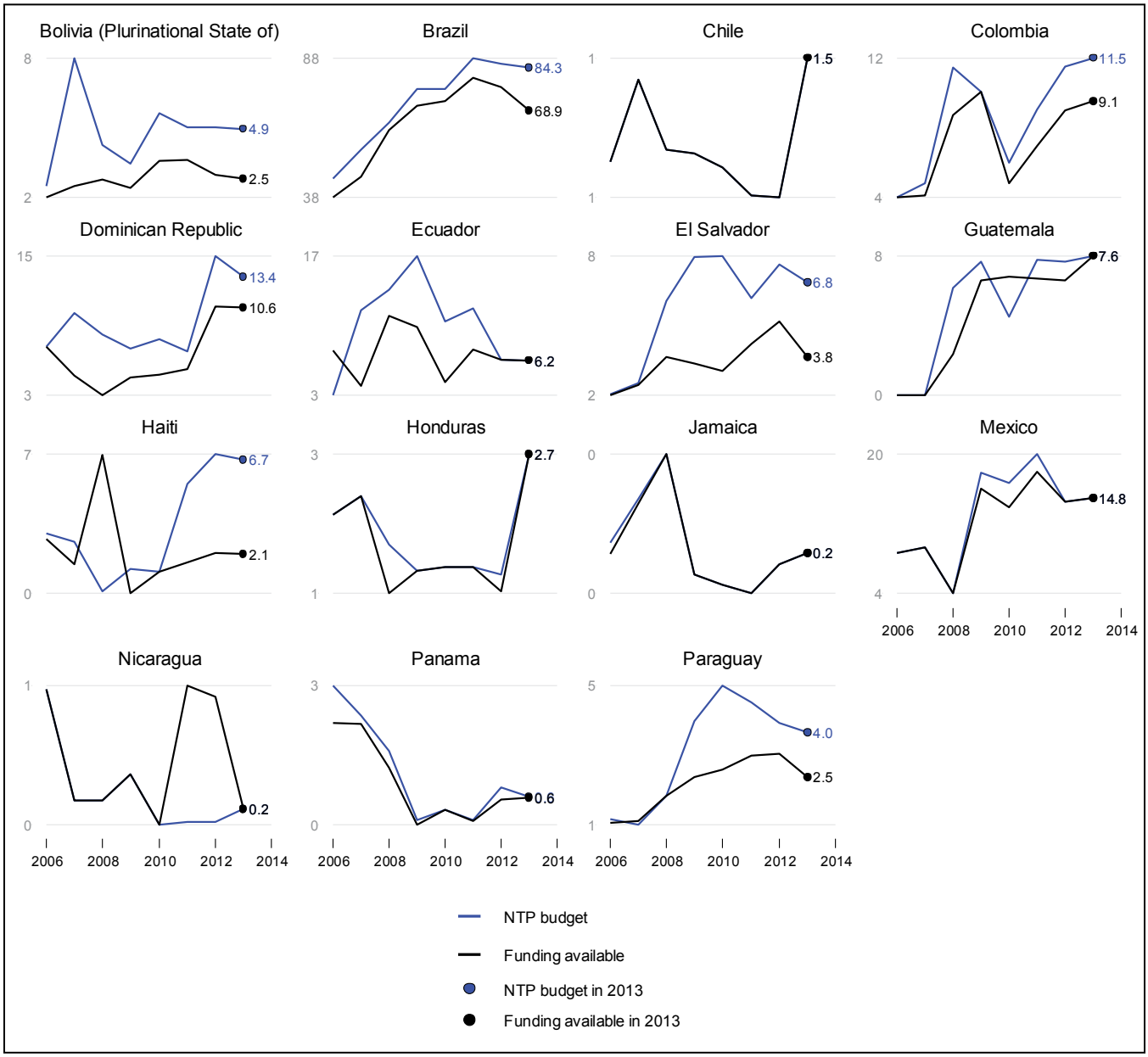
The funding gap for first-line drugs is about US$ 3 million in 2013, compared with around US$1 million in previous years. Brazil, Mexico, and Bolivia account for this large funding gap in first-line drugs, with funding gaps reported of US$ 1 million, US$ 0.6 million and US$ 0.6 million respectively. Increased funding gaps are also expected for DOTS in 2013, it will reach US$ 15 million, compared with 6 million in 2012. This increase is mainly explained by Brazil (US$ 8 million in 2013 compared with US$ 2 million in 2012) and Haiti (US$ 3 million in 2013 compared with US$ 1 million in 2012).

[16] http://data.worldbank.org/indicator/NY.GNP.PCAP.CD.

[17] When the cost per TB patient treated is less than the GDP per capita, it is likely that the efforts to control TB in a particular country are cost-effective. In this report, we are using the cost per TB patient treated, with the data reported by countries routinely, as a gross-proxy for cost-effectiveness measure. Please note that we have not conducted any cost-effectiveness analysis. Following the recommendations of the Commission on Macroeconomics and Health, there are three thresholds to analyse the cost-effectiveness of a health intervention: 1) Highly cost-effective, when the cost-effectiveness measure is less than GDP per capita; 2) Cost-effective, between one and three times GDP per capita; and 3) Not cost-effective, more than three times GDP per capita. (http://www.who.int/choice/costs/CER_thresholds/en/index.html). Other thresholds for tuberculosis can be found in the Disease Control Priorities in Developing Countries (2005) (http://www.dcp2.org/main/Home.html).

Trends in NTP budgets and available funding in these 15 countries as a whole conceal important variations among them (**Table 15** and **Figure 34**). Regional trends for funding for the period 2006-2013 are dominated mainly by the trends in Brazil, and to a lesser extent by those in Mexico. 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. There are three groups of countries: 1) those that have reported funding gaps in every year (Bolivia, Colombia, Dominican Republic, El Salvador, Haiti and Paraguay); 2) those that have never reported funding gaps or very small funding gap (Chile, Honduras, Jamaica, Mexico and Panama); and 3) those that expect to close the funding gap in 2012 or 2013 (Ecuador, Guatemala and Nicaragua).

Figure 34. NTPs budget and available funding, 15 selected countries, 2006-2013.



The ability to mobilize resources can be assessed by comparing the funding available with budgets and the ability to use the financial resources can be assessed by comparing the expenditures with the funding available (**Table 16**). The latest year for which data are available for all three indicators is 2011. In this year, Brazil, Chile, Honduras, Jamaica, Mexico and Panama were the most successful of the 15 countries in mobilizing funds for their budgets, while Ecuador and Haiti were the least successful. Nicaragua reported a larger amount of funding available compared with the budget required in 2011 (i.e. a surplus instead of a funding gap), this is likely to be an error in the reporting of data that has not yet been corrected by the country.

Table 16. NTPs budget, available funding and expenditure in 2011 (US$ millions).

	NTP budget	Funding available[a]	Funding received[b]	Expenditure	Funding available as % of NTP budget	Funding received as % of funding available[c]	Expenditures as % of funding available
Brazil	88	81	89	89	92%	110%	110%
Mexico	20	18	14	14	90%	80%	80%
Ecuador	12	7.4	6.1	6.1	64%	82%	82%
Colombia	8.6	6.5	5.5	5.5	76%	85%	85%
Guatemala	7.4	6.4	6.4	6.3	86%	100%	98%
Dominican Republic	6.7	5.1	9.9	10	76%	194%	194%
El Salvador	6.2	4.4	4.4	4.4	71%	100%	100%
Haiti	5.5	1.7	10	2.7	31%	588%	159%
Bolivia	5.0	3.4	3.4	1.9	68%	100%	56%
Paraguay	4.9	3.2	2.6	2.6	65%	81%	81%
Honduras	1.2	1.2	1.2	1.2	100%	100%	100%
Chile	0.5	0.5	0.7	0.7	100%	140%	140%
Nicaragua	0.2	0.8	0.8	0.1	–	–	–
Panama	0.2	0.2	1.2	1.2	100%	600%	600%
Jamaica	0.1	0.1	0.1	0.1	100%	100%	100%

Notes:
– Data are not available or are incomplete.
[a] Based on 2011 budget data reported in 2011.
[b] Based on received funding of 2011, data reported in 2012.
[c] This indicator can be above 100% when the country has mobilized additional resources after having reported the budget data in 2011.

Countries that have received the funding face the important challenge to be able to spend the money. All of these 15 countries reported a high proportion (above 80%) of expenditures of their funding available, and in some cases the funds that were raised and spent exceed the original budget (Brazil, Chile, Dominican Republic and Panama). Haiti mobilized more resources than anticipated in their budgets (received funding of US$ 10 million compared with available funding of US$ 1.7 million), however only a small proportion was spent (US$ 2.7 million).

Analysis at the global level[18,19] suggests that low and middle-income countries have capacity to mobilize increased funding from domestic sources, particularly upper-middle income countries. More recent analysis estimates the funding gap in low and low-middle income countries for the period 2012-2016 by considering three scenarios to forecast the growth of the domestic funding[20]: 1) **Low**, where domestic contributions increase only at the rate

[18] Global TB Report 2012, chapter 4. http://who.int/tb/publications/global_report/gtbr12_main.pdf.
[19] The Global Plan to Stop TB 2011-2015. http://www.stoptb.org/global/plan/.
[20] Recent analysis by WHO/STB/TME conducted for the Global Fund to fight AIDS, Malaria and Tuberculosis.

of economic growth as forecasted by the International Monetary Fund; 2) **Medium**, where domestic funding in countries that "underperform" reach the level of the 2011 median performer by 2020; and 3) **High**, where domestic funding in countries that "underperform" reaches the level of the 75th percentile by 2020. This analysis then compares the estimated resource needs as per the Global Plan with the forecast of domestic funding. The medium scenarios suggests that the additional international donor funding required for the low and low-middle income countries in the region is between US$ 84 million for diagnosis and treatment of TB and MDR-TB in the period 2014-2016 to close funding gaps, which is equivalent to around US$ 27-29 million per year.

4.5 Summary points on TB financing

1. Funding for TB care and control is expected to reach US$ 246 million in 2013 in the 15 selected countries of the Region.

2. Domestic funding from national governments is the single largest source of funding for TB care and control, accounting for 90% of total expected funding in 2013. It represents less than 1% of public health expenditure.

3. In all of the countries in the Region the cost per patient treated is less than GDP per capita.

4. The Global Fund is the largest source of external funding; it is expected to contribute with US$ 13 million in 2013.

5. Countries continue to report funding gaps: in 2013 the funding gap is expected to reach US$ 38 million in these 15 countries.

6. Low- and middle-income countries have the capacity of mobilize funds from domestic sources, however, international donor commitments are still needed and these are expected to reach US$ 27-29 million per year to close funding gaps in low and low-middle income countries in the period 2014-2019.

CHAPTER 5:
Conclusions

This chapter summarizes the main conclusions about recent TB epidemiology, control and financing in the Americas that can be drawn from this report.

1. TB incidence, prevalence and mortality continue to decline in Americas, and the Region is on track to meet the global targets for reduction in disease burden for 2015. Control efforts and policies need targeting towards the areas and countries with a higher burden of TB: The major burden of TB is situated in South America, where the majority of TB cases occur, and in the Caribbean, especially in Haiti, where the incidence rate is nearly eight times higher than incidence in the whole Region.
2. Further strengthening of laboratory capacity and performance is needed in the Americas. There are currently shortages of laboratory capacity and external quality assurance in some countries with a high burden of TB accompanied by substantial geographical variation in the proportion of TB cases that is confirmed by laboratory methods. Strengthening of laboratory capacity should include further roll-out and implementation of new diagnostic tests, especially in countries with a high-burden -expected or known- of drug-resistant TB.
3. Treatment success among sputum smear-positive TB cases in the Americas is still low in some countries. Limited progress is currently made towards the 2015 target for treatment success. In some countries, there is a high proportion of TB cases for whom the treatment outcome is either not determined 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 in countries with a high proportion of treatment outcomes not evaluated. Particular attention is needed to improve treatment outcomes among HIV-positive, re-treatment and MDR-/XDR-TB patients.
4. There is a considerable deficit of DST and MDR-TB case detection in the Americas. Overall, DST results for less than one fifth of re-treatment cases were available in 2011. Low DST coverage results in a low detection rate of MDR-TB cases: Only 58% of the estimated MDR-TB cases were actually detected in the Americas. 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 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. There is an urgent need to strengthen HIV counseling and testing in most countries in the Americas. CPT and ART should be made available for all TB patients living with HIV. Both, increased test coverage and provision of CPT and ART can serve to reduce mortality among TB cases and to improve treatment outcomes in HIV co-infected individuals. Increased action towards tackling the double burden of TB and HIV is needed, particularly in South America, in Mexico and in the Caribbean. Further, improved recording and reporting is needed to allow for reliable assessment of the performance of TB/HIV collaborative activities, including the provision of IPT and intensified TB case finding among people living with HIV in the population.
6. Financing for TB care and control in countries exists mainly from domestic sources by national governments in a high percentage but important deficits are still present. Even though there are possibilities for additional national resources, external funding is still needed.

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