Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

Tuberculosis in the Americas

Regional Report 2015

Epidemiology, Control, and Financing

Table of Contents

Abbreviations

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

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Executive Summary

This report is intended to provide a comprehensive and up-to-date assessment of the current burden of tuberculosis (TB) and progress of TB control in the Americas. The information presented in this report is based on TB surveillance and control data for the year 2014 reported to PAHO/WHO as part of the 2015 global round of TB data collection from countries and territories.

Key findings

1. In 2014, there were an estimated 277 200 incident cases of TB (uncertainty range: 309 200 – 247 600) in the Americas, equivalent to 28 (range: 25-32) cases per 100 000 population. More than two-third (68%) of all incident TB cases occurred in South America (Andean and Other[1]). The incidence rate was highest in the Caribbean subregion (69 per 100 000) followed by South America-Andean (60 per 100 000), South America-Other (39 per 100 000) and Mexico and Central America (28 per 100 000). It was lowest in North America (3.7 per 100 000). TB incidence is declining in all Americas subregions except Mexico and Central America, where it remained constant between 2008 and 2014. There were an estimated 355 900 prevalent cases of TB in the Americas in 2014 (**Chapter 1**).

2. In 2014, there were an estimated 23 000 deaths from TB: 17 000 deaths (range: 15 000 – 19 400) among people without human immunodeficiency virus (HIV) infection, and 5 900 (range: 4 500–7 700) deaths among people who were HIV-positive. TB mortality has substantially declined in the Americas since 1990 (**Chapter 1**).

3. An estimated 6 800 (range: 5 400-8 200) cases of multidrug-resistant (MDR-) TB occurred among notified pulmonary TB cases (PTB) in the Americas in 2014. Peru and Brazil accounted for more than half of all MDR-TB cases in the region. MDR-TB cases represented an estimated 2.3% of new PTB cases and 11% of re-treatment PTB cases. (**Chapter 1**).

4. In 2014, an estimated 36 000 incident TB cases were co-infected with HIV, 13% of all the people who developed TB in the Americas. Nearly half of these HIV-positive TB cases were in Brazil and Haiti. HIV prevalence among incident TB cases varied across the subregions from 5.9% (North America) to 20% (Caribbean) (**Chapter 1**).

5. Good progress has been made in the Americas until 2014 towards reaching the 2015 global targets for reducing TB incidence, prevalence and mortality that were set by the Global Plan to Stop TB 2011-2015 within the context of the United Nations Millennium Development Goals (MDGs). At the regional level, the targets to reach a declining trend in TB incidence and to reduce TB prevalence and mortality by 50% compared to their levels in 1990 have been met. At the country level, annual TB incidence has been rising over the past five years only in El Salvador, Nicaragua and Uruguay. Despite good achievements overall, several countries in the Americas are unlikely to have met the targets for prevalence and mortality (**Chapter 2**).

[1] The Andean subregion includes Bolivia, Colombia, Ecuador, Peru, and Venezuela; the South America-Other subregion includes the countries of the Southern cone (Argentina Chile, Paraguay and Uruguay) plus Brazil, Guyana and Suriname (**Table 1**).

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6. In 2014, a total of 228 000 TB cases (216 700 new and relapse TB cases) were notified by National Tuberculosis Programs in the Americas and reported to PAHO/WHO. Among pulmonary TB cases, 76% of new and relapse cases notified were bacteriologically confirmed (as opposed to clinically diagnosed). Most notified TB cases were adults and males.

7. The Americas have met the 2015 global target for TB case detection (≥70%): notifications of newly diagnosed TB cases in 2014 represented 81% (range: 72%-90%) of estimated incident cases. Case detection across the region has increased in recent years, particularly in the Caribbean, Mexico and Central America, and South America-Other subregions (**Chapter 3**).

8. The Americas are unlikely to have met the 2015 global target of at least 85% treatment success in new and relapse patients. Of TB patients treated in the 2013 cohort, 75% were successfully treated, 0.6% failed treatment, 6.7% died, and 8.1% were lost to follow-up (9.2% were not evaluated). Treatment success varied across the countries between 36% and 93%. TB treatment success continued to be low particularly among re-treatment patients other than relapse and among HIV-positive patients (**Chapter 3**).

9. Strengthening laboratory capacity and improving access to rapid TB diagnostics remain priorities for TB control in the Americas. In 2014, data for laboratory capacity and external quality assurance (EQA) were reported by 23 countries. Laboratory capacity for smear microscopy remained below the regional target in 4 of these 23 countries and for culture testing in 9 of these. Capacity for drug-susceptibility testing (DST) was below target in 17 of 23 countries. The roll-out of rapid molecular diagnostics continues to expand. (**Chapter 4**).

10. Although substantial efforts have been made to accelerate access to DST and adequate treatment for drug resistant (DR)-TB in the Americas, the region is unlikely to have met the 2015 targets of 100% MDR-TB case detection and ≥75% treatment success. In 2014, only 23% of laboratory-confirmed new PTB cases and 31% of all re-treatment cases had a DST result available. DST coverage varied substantially across countries and was particularly low the in the South America-Other subregion. A total of 3 083 MDR-TB cases and 662 rifampicin-resistant TB (RR-TB) cases were detected region wide, representing about half of the estimated MDR-TB cases. Treatment was initiated for 88% of MDR-TB cases detected. Treatment success in the 2012 cohort of patients was 57%. Several countries reported high rates of patients being lost to follow-up during MDR-TB treatment (**Chapter 5**).

11. In 2014, 74% of all TB cases notified in the Americas had their HIV status recorded, suggesting considerable progress in HIV test coverage over the past years. The proportion of HIV-positive patients among those with recorded HIV status was 13% overall. It was highest in the Caribbean and in South America-Other and lowest in North America. Whilst, coverage of antiretroviral treatment (ART) and co-trimoxazole preventive therapy (CPT) for HIV-positive TB patients in countries with a high burden of TB/HIV seems to have increased, more consistent reporting is needed to monitor trends. Similarly, better reporting is needed to monitor trends in TB screening and

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provision of isoniazid preventive therapy (IPT) to people living with HIV in the Americas (**Chapter 6**).

12. In 2014, a total of 10 176 TB cases among children were reported, a rate of 4.4 per 100 000 children. The proportion of children among notified TB cases was 4.9 %, with large variation across countries. Very low TB notification rates for childhood TB in some countries, particularly among children under 5 years old, seem to point to considerable under-diagnosis (**Chapter 7**).

13. Sixteen selected countries that together accounts for 86% of the notified cases in the region were analyzed. They received funding for treatment of drug-susceptible tuberculosis that reached US$ 330 million in 2014, double the level of 2006. Increases in funding were accompanied with increases in the number of patients successfully treated. The cost per patient in these patients is increasing overall in all countries compared with previous years. It is less than GDP per capita in 13 of the 16 selected countries. (**Chapter 8**).

14. Funding for TB prevention, diagnosis and treatment reached US$ 420 million in 2015, more than double the level of 2006. Funding was mostly used for diagnosis and treatment of drug-susceptible TB. Overall, most resources have been mobilized domestically, reaching 95% of total available funding in 2015(US$ 400 million). Meanwhile, total donor funding remained stable at around US$ 20 million per year in the last three years, mostly from the Global Fund which is the principal donor in the region. Up to the end of 2015 it had disbursed US$ 100 million for TB control for the countries in the Americas. (**Chapter 8**).

15. Funding gaps amount to US$ 64 million in 2015 for the group of 16 countries selected. Reported NTP funding gaps are mainly for program management and laboratory infrastructure/equipment/supplies. (**Chapter 8**).

16. While achievements have been major in reducing the burden of disease in the Americas, gains in TB control need to be sustained and intensified in countries with high TB rates. Current main priorities for TB control in the Americas include: 1) strengthening laboratories capacity and roll-out of rapid diagnostics to increase MDR-TB case detection; 2) strengthening treatment programs to achieve better outcomes for both non-MDR- and MDR-TB patients; 3) enhancing TB/HIV collaborative activities; and 4) increasing efforts to improve detection of TB in children and other vulnerable populations, including the poor and marginalized; and maintaining and increasing funding for TB prevention and control. (**Conclusions**).

Introduction

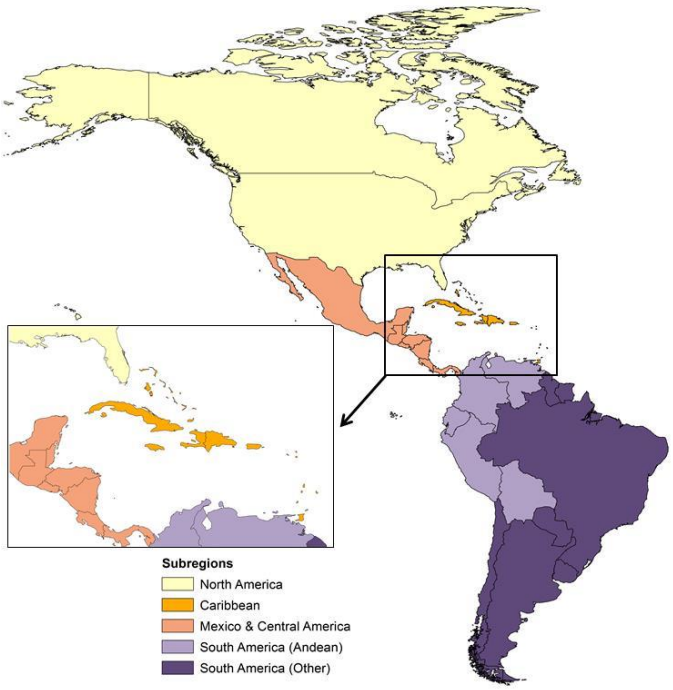
This report has been produced and published by PAHO's Regional Tuberculosis Program. It is intended to provide a comprehensive and up-to-date overview of the current epidemiological situation of TB in the Americas, and to report on efforts towards TB control in the Region of the Americas.

The analyses presented in this report are based on data submitted by 35 countries and 4 associate member states of the Americas to PAHO and the World Health Organization (WHO) during the 2015 global round of data collection. Data are presented for the Americas as a whole, five sub-regions, 35 countries and 4 associate member states (**Figure 1**). Subregions, countries and associate member states are listed in **Table 1**. Data on TB case reports from 7 territories are also presented (**Box 6**).

The report provides estimates of the current burden of TB and shows progress towards the global targets for TB control in the Americas one year before the target year 2015. It presents regional data on case notification and treatment outcomes, diagnostics and laboratory strengthening, management of drug-resistant TB and TB/HIV collaborative activities, and financing for TB control. As in last year's report, a separate chapter focuses on childhood TB. The last chapter of the report provides key conclusions on regional TB epidemiology, control and financing.

This report incorporates revised WHO case definitions for TB and drug-resistant TB, and the revised WHO categories for assigning treatment outcomes that were used for the first time in the 2014 round of global TB data collection.[2]

Figure 1: Region of the Americas: Division into five subregions



[2] Definitions and reporting framework for tuberculosis – 2013 revision. Geneva, World Health Organization, 2013 (WHO/HTM/TB/2013.2). Available at: http://www.who.int/tb/publications/definitions/en/.

Introduction

Table 1: Region of the Americas: subregional divisions and countries (PAHO member states and associate members) with population data, 2014[3]

Sub-region/country	Population
North America	**355,036,427**
Canada	35,587,793
United States of America	319,448,634
Caribbean	**41,762,257**
Antigua and Barbuda	90,900
Aruba*	103,441
Bahamas	383,054
Barbados	283,380
Cuba	11,379,111
Curaçao*	155,763
Dominica	72,341
Dominican Republic	10,405,943
Grenada	106,349
Haiti	10,572,029
Jamaica	2,783,301
Puerto Rico*	3,686,517
Saint Kitts and Nevis	54,944
Saint Lucia	183,645
Saint Vincent and the Grenadines	109,360
Sint Maarten (Dutch part)*	37,696
Trinidad and Tobago	1,354,483
Mexico & Central America	**170,461,473**
Belize	351,706
Costa Rica	4,757,606
El Salvador	6,107,706
Guatemala	16,015,494
Honduras	7,961,680
Mexico	125,385,833
Nicaragua	6,013,913
Panama	3,867,535
South America (Andean)	**135,923,171**
Bolivia (Plurinational State of)	10,561,887
Colombia	47,791,393
Ecuador	15,902,916
Peru	30,973,148
Venezuela (Bolivarian Republic of)	30,693,827
South America (Other)	**278,094,746**
Argentina	42,980,026
Brazil	206,077,898
Chile	17,762,647
Guyana	763,893
Paraguay	6,552,518
Suriname	538,248
Uruguay	3,419,516
Total (Americas)	**981,278,074**

* PAHO associate member

[3] United Nations (UN) population estimates; see: http://www.un.org/en/development/desa/population

Chapter 1

Estimated Burden of Tuberculosis in the Americas

The burden of disease caused by TB in the Americas is measured in terms of incidence, prevalence, and mortality. Estimates are produced annually by WHO using information gathered through case notification, death registration, expert opinion and consultation with countries.

Incidence is defined as the number of new and relapse[4] episodes of TB occurring in a given year. *Prevalence* is defined as the estimated number of TB cases at a given point in time. *Mortality* from TB is defined as the number of deaths caused by TB. As in last year's report, data on estimated TB deaths among both HIV-negative and HIV-positive people are presented.[5] Estimates of TB incidence, prevalence and mortality include diagnosed and undiagnosed cases. The estimates are usually presented as absolute numbers of TB cases and deaths, and as rates per 100 000 of the population using United Nations population estimates.

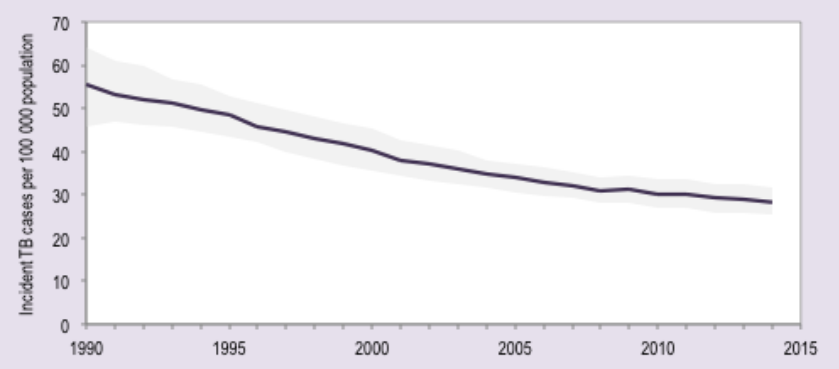
Although every effort is made to use existing data and information, there is considerable uncertainty around the burden estimates. These include uncertainty about data recorded and reported; missing data and the extrapolations used to impute these, and parameter values used to estimate the number of undiagnosed (or untreated) TB cases. Unless indicated otherwise, the WHO estimates include uncertainty ranges that are defined as the 2.5th and 97.5th percentiles of outcome distributions established with the use of simulations.[6] Annual trends in the estimates have to be interpreted with caution as surveillance systems, reporting practices and estimation methodology may be subject to changes over time.

1.1. Incidence

In 2014, an estimated 277 200 (uncertainty range: 247 600 - 309 200) incident TB cases occurred in the Americas. The incidence rate was 28 per 100 000 population, with an uncertainty range of 25.2 to 31.5 per 100 000.

Estimated annual incidence rates have constantly declined since 1990, although this decline appears to be slower in recent years (**Figure 2**).

Figure 2: Estimated TB incidence in the Americas 1990 – 2014[a]



[a] Shaded areas represent uncertainty intervals

[4] Relapse episodes are defined as a new episode of TB in people who have had TB in the past and for whom there was bacteriological confirmation of cure and/or documentation that treatment was completed.

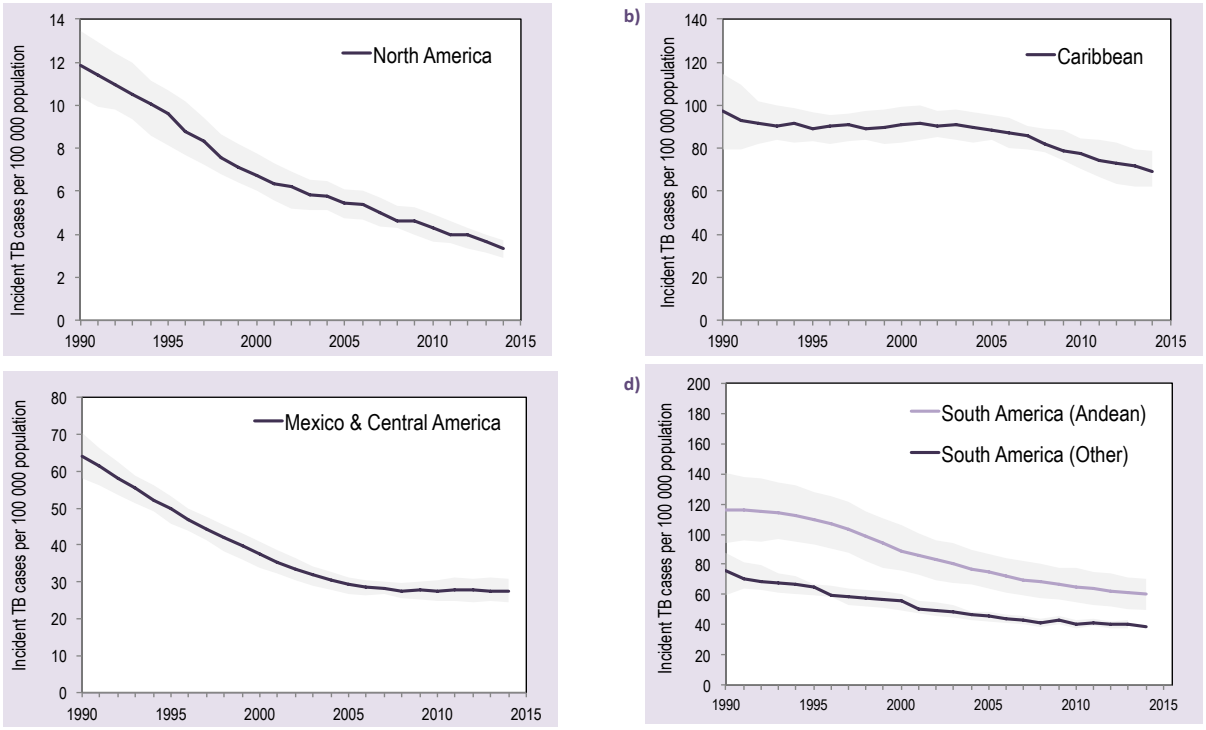
[5] TB deaths among HIV-positive people are classified as HIV deaths according to the revised version of the International classification of diseases (ICD-10) and were thus not included in mortality estimates in previous years.

[6] For more information, see: Technical Appendix to the Global Tuberculosis Report 2015 (WHO), available at: http://www.who.int/tb/publications/global_report/gtbr15_online_technical_appendix.pdf?ua=1

At the subregional level, estimated incidence in 2014 was highest in the Caribbean region (69 per 100 000; uncertainty: 62 – 79) followed by South America-Andean (60 per 100 000; uncertainty: 50 – 70), South America-Other (39 per 100 000; uncertainty: 37 – 42) and Mexico and Central America (28 per 100 000; uncertainty: 25 – 31). It was lowest in North America (3.7 per 100 000; uncertainty: 2.9 – 3.3). The rate is declining in all subregions except Mexico and Central Americas where it has remained constant over the past seven years (**Figure 3**).

The highest absolute number of incident TB cases occurred in South America – Other, which had an estimated 107 590 cases, accounting for 39% of all cases in the Americas. More than two-third (68%) of all incident TB cases in the Americas occurred in two sub-regions of South America (Andean and Other).

Figure 3 a-d: Estimated TB incidence in five subregions of the Americas, 1990 – 2014[a]



[a] Shaded areas represent uncertainty intervals

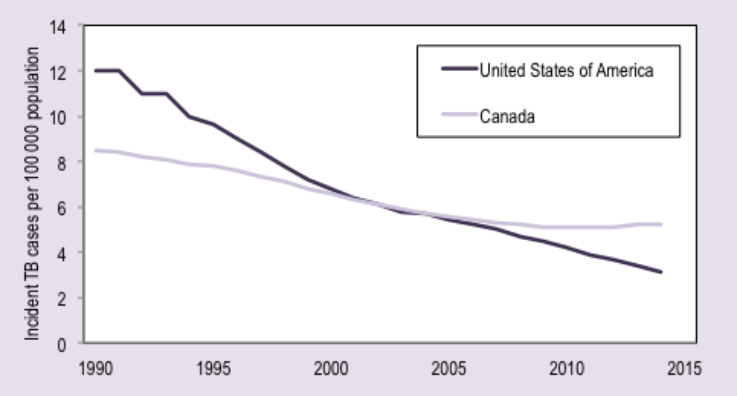
Countries of the North America subregion

In the United States and Canada (the two countries of the North America subregion), an estimated total of 9 900 and 1 900 incident TB cases occurred in 2014, respectively.

TB incidence rates in this subregion are among the lowest in the Americas. In 2014, the rate was 3.1 (uncertainty: 2.7 – 3.5) per 100 000 in the United States, following a steady decline over the past years. In Canada, the rate was 5.2 (uncertainty: 4.6 – 5.9) per 100 000 and appears to have remained stable in recent years after a marked decline until 2010 (**Figure 4a**).

Figure 4 (a-e): Estimated TB incidence by subregion and country in the Americas, 1990 – 2014

Figure 4a: Countries of the North America subregion



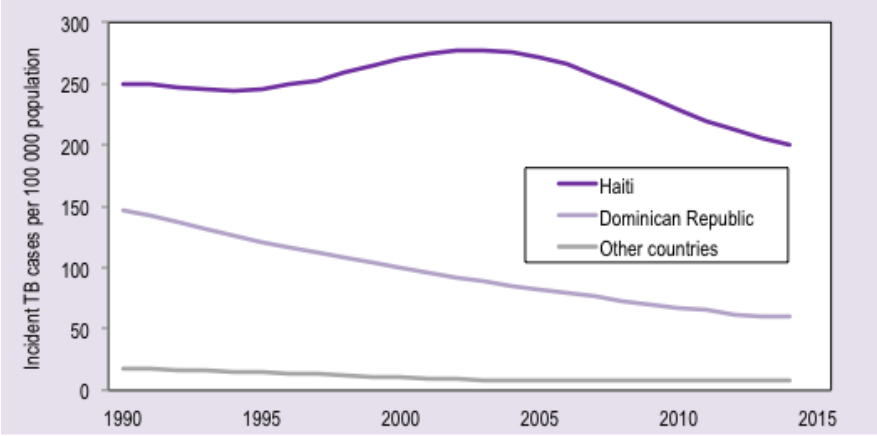
Countries of the Caribbean subregion

In 2014, the 28 900 incident TB cases estimated for the 17 countries and associate member states of the Caribbean subregion (Antigua and Barbuda, Aruba, Bahamas, Barbados, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Puerto Rico, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten, Trinidad and Tobago) mainly occurred in three countries: Haiti accounted for 73% of these cases (21 000 cases), the Dominican Republic for 21% (6 200 cases), and Cuba for 3.8% (1 100 cases). Trinidad and Tobago accounted for half of the remaining cases (1% or 290 cases), followed by Jamaica (0.4% or 130 cases). Twelve other Caribbean countries represent the residual 0.6% (171 cases).

TB incidence in Haiti was 200 (uncertainty: 177 - 225) per 100 000, the highest of all countries in the Americas. It was lower in the Dominican Republic (60 per 100 000; uncertainty: 53 - 68) and much lower in Cuba (9.4 per 100 000; uncertainty: 8.1 - 11) and in the 14 remaining countries (overall: 6.3 per 100,000; uncertainty: 5.5 - 7.3).

TB incidence has been declining in Haiti and the Dominican Republic over the past years. In the other countries, it has been declining or remained stable at a low level (**Figure 4b**).

Figure 4b: Countries of the Caribbean subregion

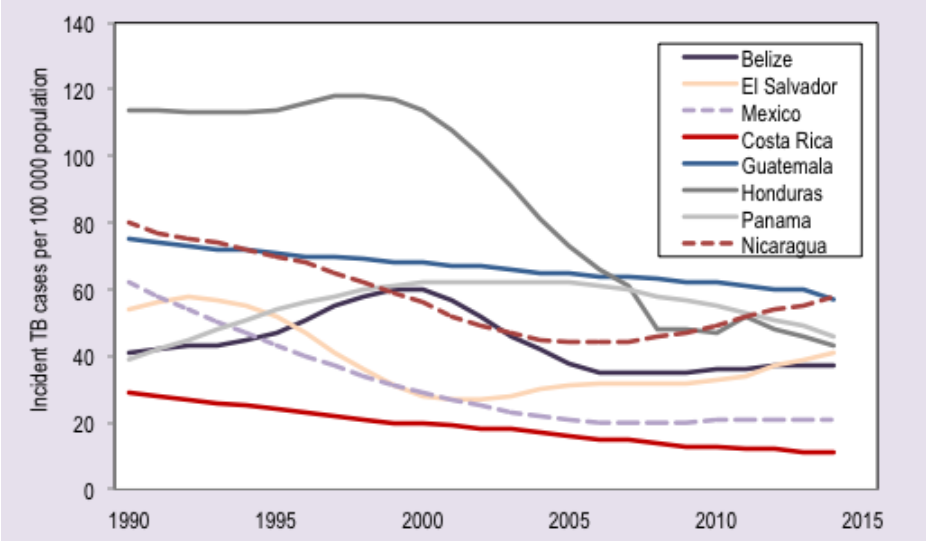


Countries of the Mexico and Central America subregion

In 2014, an estimated 47 060 TB cases occurred in the Mexico and Central America subregion. Of these, an estimated 26 000 incident TB cases occurred in Mexico, more than half (55%) of the estimated TB burden in the eight countries of the Mexico and Central America subregion (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico Nicaragua and Panama). Mexico was followed by Guatemala (9 200 cases or 20%), Nicaragua (3 500 cases or 7.4%), and Honduras (3 400 cases or 7.2%). A total of 4 960 cases (11%) occurred in the four remaining countries: Belize (130 cases or 0.3%), Costa Rica (530 cases or 1.1%), El Salvador (2 500 cases or 5.3%), Panama (1 800 cases or 3.8%).

In 2014, TB incidence per 100 000 was highest in Nicaragua (58 per 100 000; uncertainty: 53 - 63) and lowest in Costa Rica (11 per 100 000; uncertainty: 10 - 13). While in the past years rates have been declining in Guatemala, Panama and Honduras, TB incidence has recently been increasing in Nicaragua and El Salvador, and it appears to be stable in Mexico, Costa Rica and Belize (**Figure 4c**).

Figure 4c: Countries of the Mexico and Central America subregion



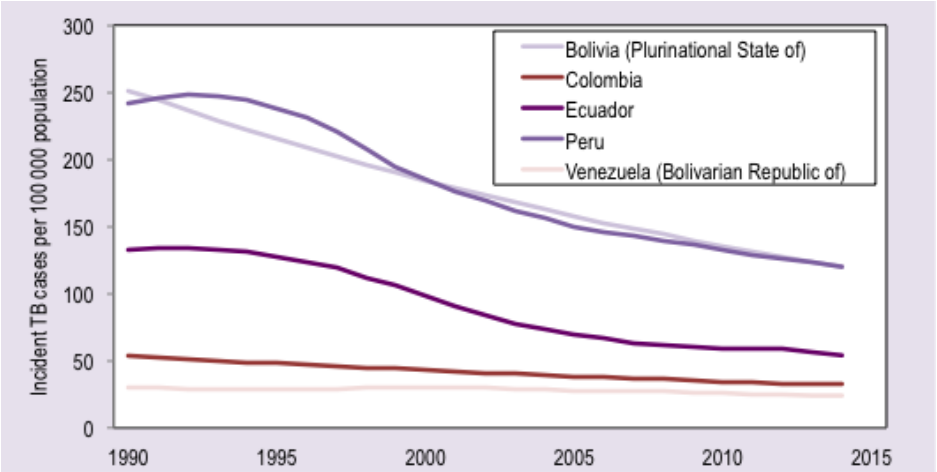
Countries of the South America–Andean subregion

In 2014, an estimated 81 900 TB cases occurred in the South America-Andean subregion. With 37 000 incident TB cases, Peru accounted for 45% of the estimated TB burden in the five countries of this subregion (Bolivia, Colombia, Ecuador, Peru, and Venezuela). Peru is followed by Colombia (16 000 cases or 20%), Bolivia with 13 000 cases (16%), Ecuador with 8 600 cases (11%) and Venezuela with 7 300 cases (9%).

Peru currently ranks second in the Americas for total number of incident TB cases, after Brazil.

Peru and Bolivia had the highest TB incidence (both 120 per 100 000; uncertainty: 98 – 145 and 106 – 135, respectively), whilst Venezuela had the lowest (24 per 100 000; uncertainty range: 21-27). In the past two decades, TB incidence has been declining in all Andean countries (**Figure 4d**).

Figure 4d: Countries of the South America-Andean subregion



Countries of the South America-Other subregion

In 2014, an estimated 107 590 TB cases occurred in the South America-Other subregion. With 90 000 incident TB cases, Brazil accounted for nearly one-third (32.4%) of the incident TB burden in the Americas and 84% of the incident TB burden for the seven countries in the subregion (Argentina, Brazil, Chile, Guyana, Paraguay, Suriname, and Uruguay). Brazil ranks first amongst all countries in the Americas for estimated numbers of incident TB cases. Brazil was followed by Argentina which had 10 000 cases (9.3%); the other five countries shared the remaining TB burden of 7 600 cases (7%) in the subregion.

Despite its relatively lower burden (790 cases), estimated TB incidence in the subregion was highest in Guyana (103 per 100 000; uncertainty: 91 - 116); this was followed by Brazil (44 per 100 000; uncertainty: 42 - 46). TB incidence was lowest in Chile (16 per 100 000; uncertainty: 14 - 18). Over the past decade, TB incidence has been declining in all countries except for Uruguay where it has been increasing and Chile, where it has remained relatively stable (**Figure 4e**).

Figure 4e: Countries in the South America-Other subregion

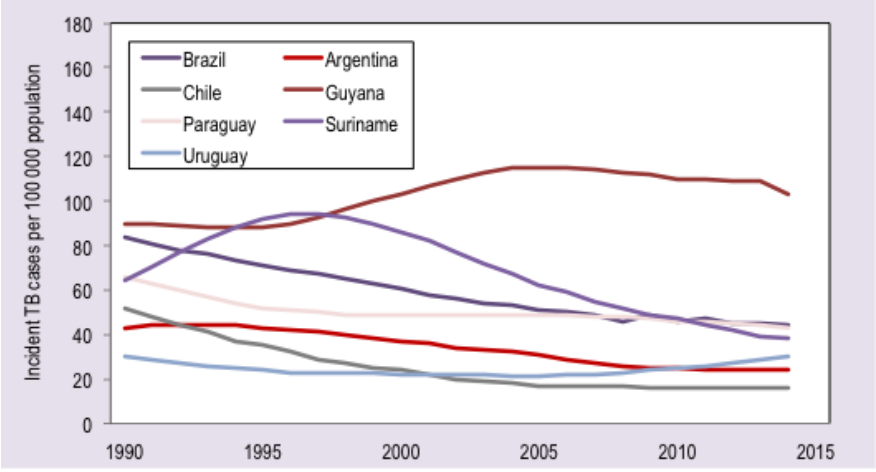
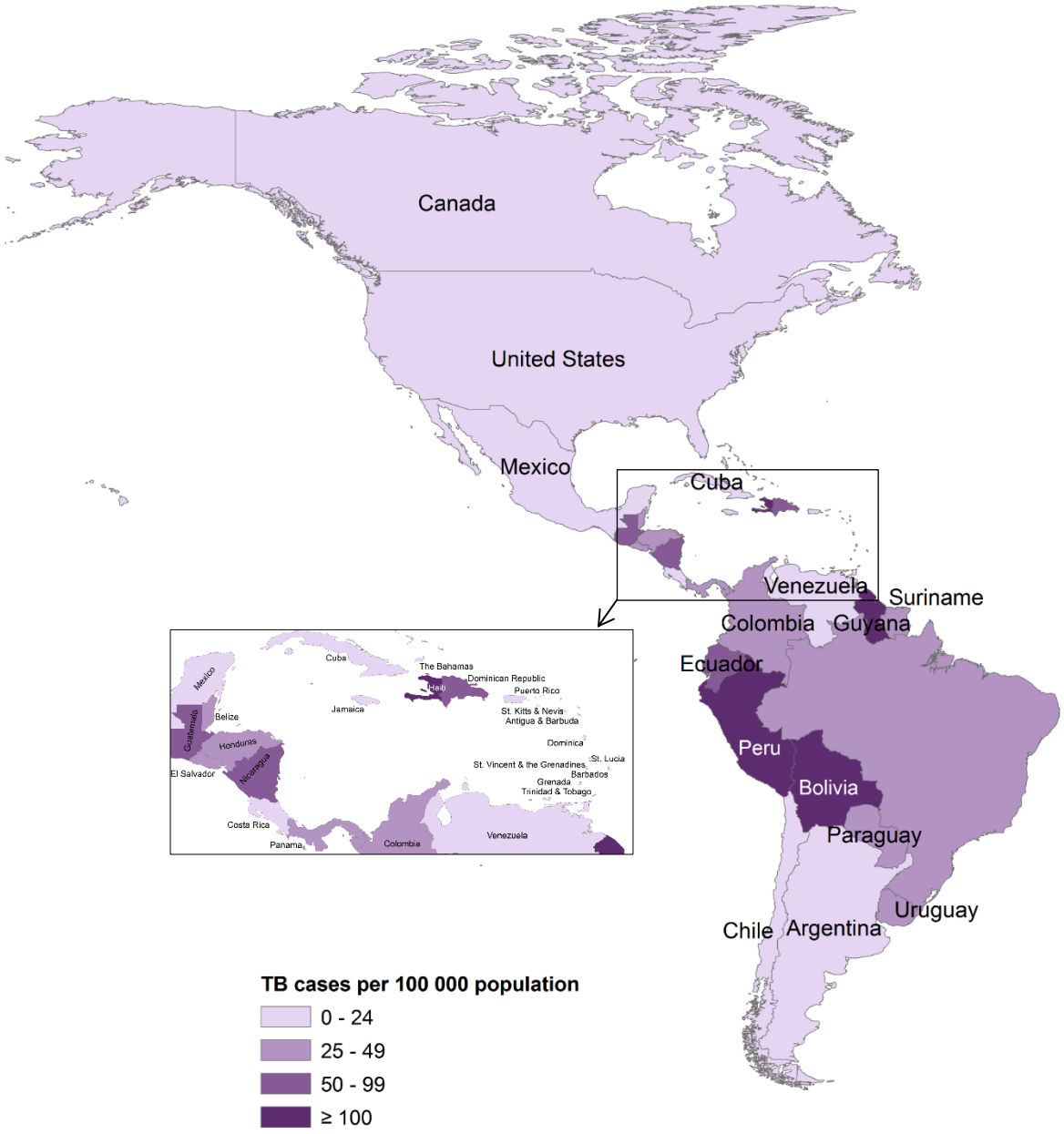


Figure 5 shows the geographical distribution of the estimated TB incidence in the Americas. **Box 1** and **Figure 6** show the top 10 countries in the Americas by estimated total numbers and rates of incident TB cases.

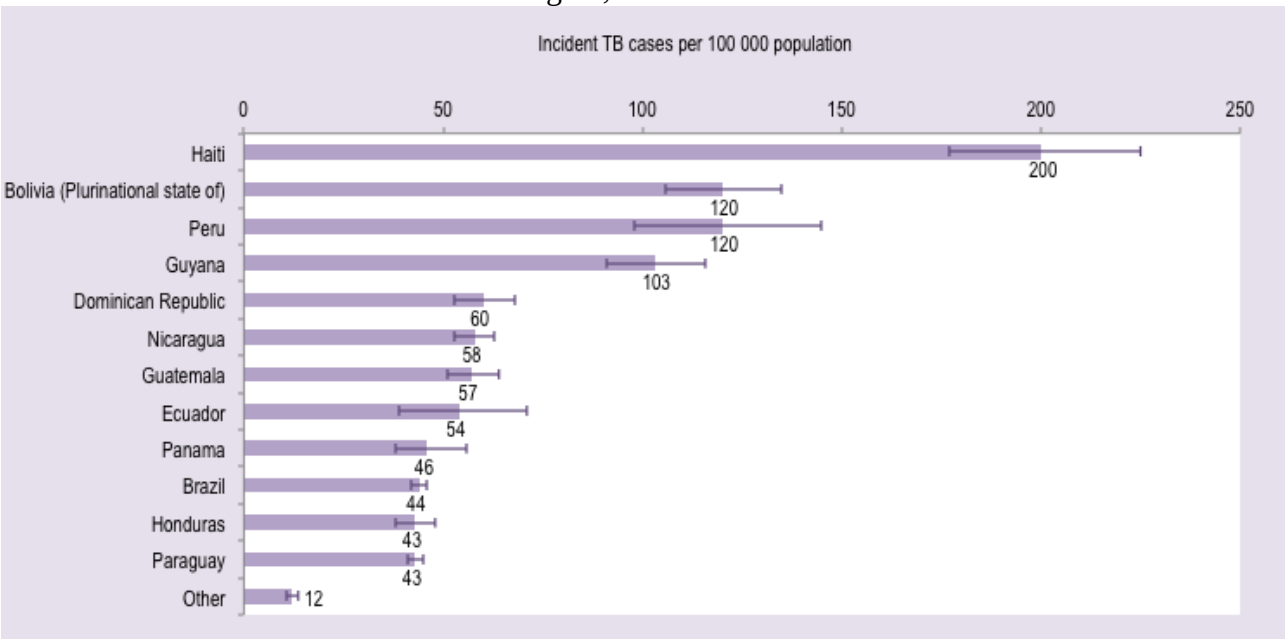
Figure 5: Estimated TB incidence per 100 000 population in the Americas, 2014



Box 1: Top 12 countries by estimated numbers of incident TB cases, Americas region, 2014

#	Country	Incident TB Cases	%	Cumulative %
1	Brazil	90,000	32.5%	32%
2	Peru	37,000	13.3%	46%
3	Mexico	26,000	9.4%	55%
4	Haiti	21,000	7.6%	63%
5	Colombia	16,000	5.8%	69%
6	Bolivia (Plurinational State of)	13,000	4.7%	73%
7	Argentina	10,000	3.6%	77%
8	United States of America	9,900	3.6%	80%
9	Guatemala	9,200	3.3%	84%
10	Ecuador	8,600	3.1%	87%
11	Venezuela (Bolivarian Republic of)	7,300	2.6%	89%
12	Dominican Republic	6,200	2.2%	92%
	Others	23,041	8.3%	100%

Figure 6: Top 12 countries by estimated TB incidence per 100 000 population, Americas region, 2014[a]



[a] Error bars represent uncertainty intervals

1.2. Prevalence

Due to the lack of prevalence surveys, there is considerable uncertainty around the estimates of prevalent TB in the Americas.

In 2014, there were an estimated 355 900 (uncertainty range: 168 600 – 598 400) prevalent TB cases in the Americas, a rate of 36 (uncertainty interval: 17 – 61) per 100 000 population.

At the sub-regional level, best estimates for the number of prevalent TB cases were 14 300 for North America (4.0% of the regional estimate); 35 785 (10%) in the Caribbean; 64 510 (18%) in Mexico and Central America; 108 800 (31%) in South America-Andean and 132 480 (37%) in South America-Other.

1.3. Mortality

In 2014, there were an estimated 23 000 deaths from TB. Of these, 17 000 (uncertainty range: 15 000 – 19 500) TB deaths occurred among HIV-negative people in the Americas; an additional 5 900 (4 500 – 7 700) TB deaths occurred among HIV-positive people, representing 26% of all TB deaths in the region.

Two countries, Brazil (7 700 TB deaths, uncertainty interval: 6 700 – 8 900) and Haiti (2 870; uncertainty interval: 2 110 – 3 850) accounted for nearly half (46%) of the regional burden of death caused by TB.

Figure 7 shows the relative contribution of HIV-positive and -negative people to the estimated burden of TB deaths in the Americas since 1990.

The TB mortality rate (all TB deaths) in the Americas was 2.3 (uncertainty range: 2.0 – 2.8) per 100 000 population. Along with incidence, TB mortality has substantially declined in the Americas since 1990 (**Figure 8**). In the past 10-15 years, a rapid decline in TB mortality occurred most notably in the Caribbean, where the rate of TB deaths per 100,000 remained, nevertheless, twice as high compared to the other subregions in the Americas (**Figure 9**).

Figure 7: Estimated numbers of TB deaths, Americas region, 1990 – 2014

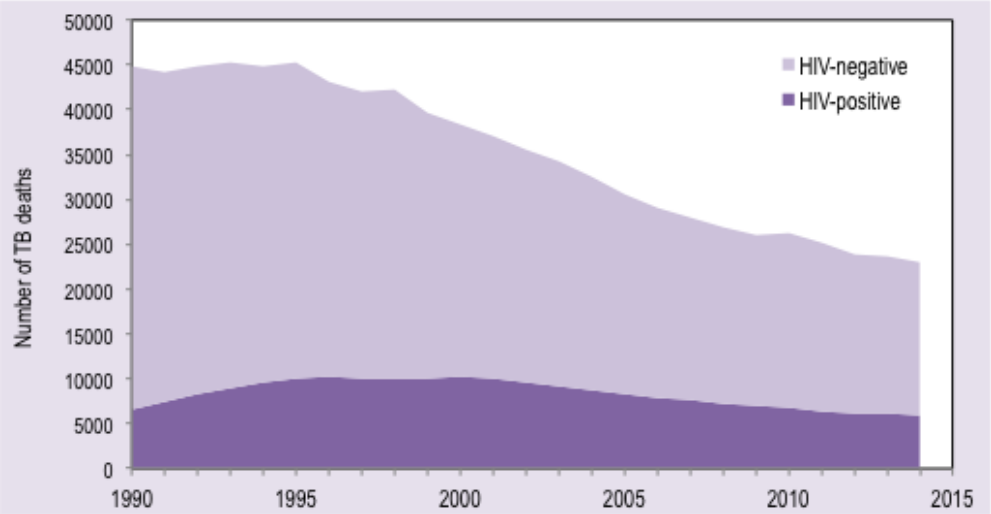


Figure 8: Estimated TB mortality (HIV-positive and -negative), Americas region, 1990 – 2014

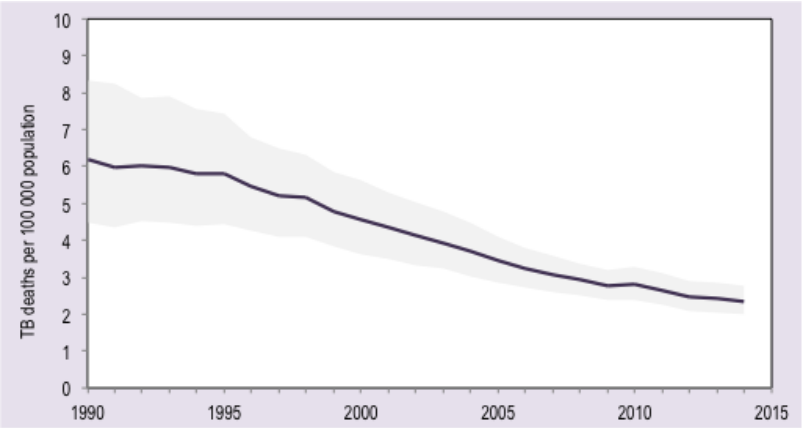
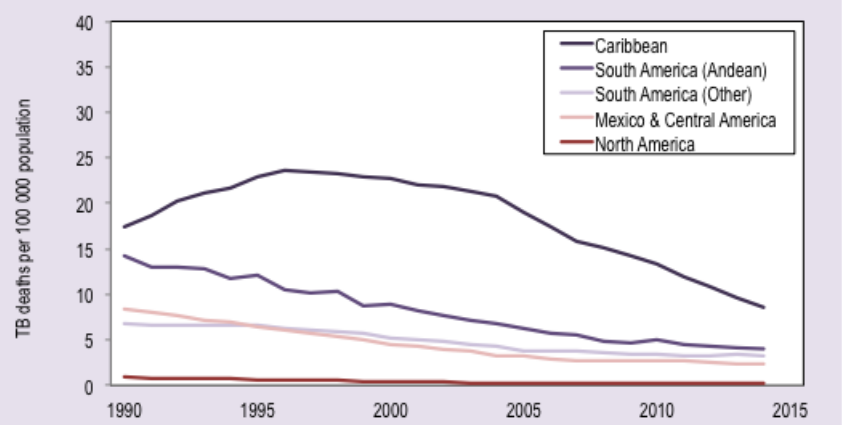


Figure 9: Estimated TB mortality (HIV-positive and -negative) by subregions, Americas region, 1990 – 2014



1.4. Multidrug-resistant TB

In 2014, there were an estimated 6 900 (uncertainty range: 5 400 – 8 200) cases of MDR-TB among notified pulmonary TB (PTB) cases in the Americas. Peru and Brazil accounted for more than half of all MDR-TB cases in the Americas (**Box 2**).

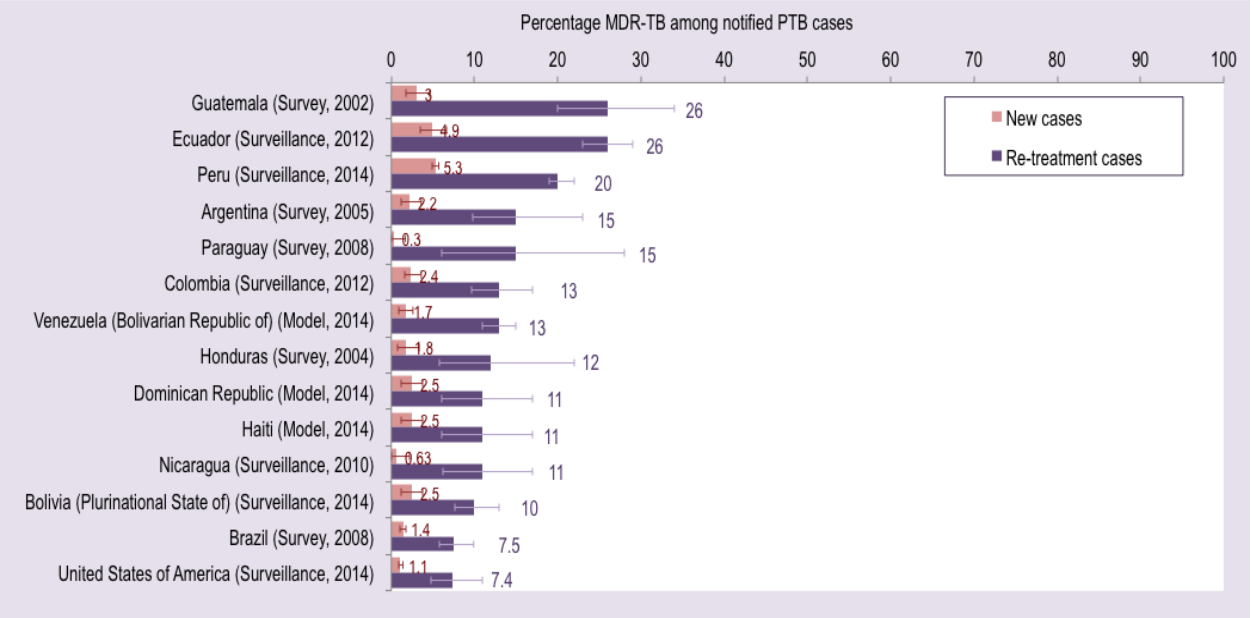
MDR-TB cases represented an estimated 2.3% (1.7% - 3.1%) of notified new PTB cases and 11% (8.2% - 14%) of re-treatment PTB cases. At the country level, the proportion of MDR-TB varied between 0.3% and 5.3% of new and between 7.4% and 26% of re-treatment PTB cases (**Figure 10**). The WHO estimates for MDR-TB are based on drug-resistance surveys, data from DR surveillance and mathematical models.

Details on the management of drug-resistant TB in the Americas are presented in **Chapter 5**.

Box 2: Top 12 countries by estimated number of MDR-TB cases, Americas region, 2014

#	Country	Estimated MDR-TB cases	% of all	Cumulative %
1	Peru	2,000	29%	29%
2	Brazil	1,800	26%	55%
3	Mexico	500	7.3%	63%
4	Haiti	450	6.6%	69%
5	Argentina	360	5.2%	75%
6	Colombia	360	5.2%	80%
7	Ecuador	310	4.5%	84%
8	Bolivia (Plurinational State of)	210	3.1%	87%
9	Venezuela (Bolivarian Republic of)	150	2.2%	90%
10	Dominican Republic	150	2.2%	92%
11	Guatemala	130	1.9%	94%
12	United States of America	110	1.6%	95%
	Others	329	4.8%	100%

Figure 10: Proportions of notified PTB cases estimated to have MDR-TB, Americas region, 2014[a]



[a] Countries with at least 50 estimated MDR-TB cases; error bars show uncertainty ranges

1.5. TB and HIV

In 2014, there were an estimated 36 000 (uncertainty range: 30 900 – 40 600) HIV-positive incident TB cases in the Americas. Brazil and Haiti accounted for nearly half of all HIV-positive incident TB cases in the region (**Box 3**).

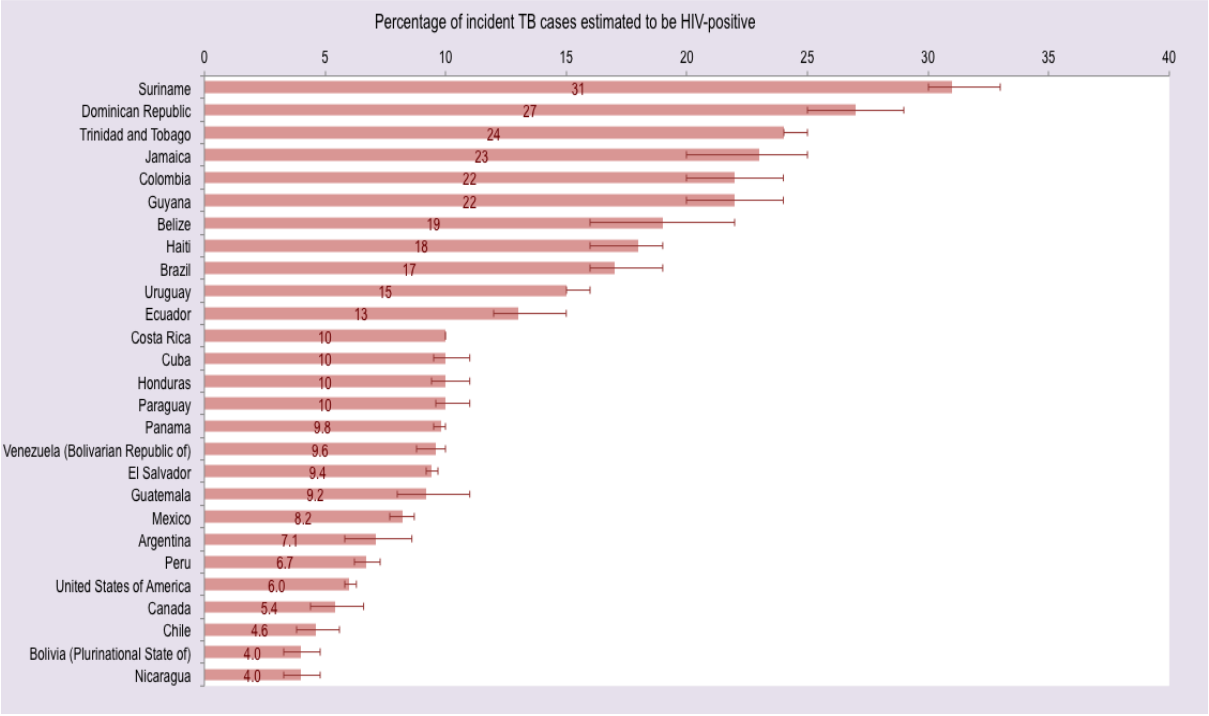
The estimated prevalence of HIV infection among incident TB cases was 13%. HIV prevalence varied across the subregions between 5.9% (North America) and 20% (Caribbean) and across countries from 4% and 31% (**Figure 11**).

Details on TB/HIV collaborative activities in the Americas are presented in **Chapter 6.**

Box 3: Top 10 countries by estimated numbers of HIV-positive incident TB cases, Americas region, 2014

#	Country	Incident TB-HIV cases	% of all	Cumulative %
1	Brazil	13,000	36%	36%
2	Haiti	4,400	12%	48%
3	Mexico	2,300	6.4%	55%
4	Peru	2,300	6.4%	61%
5	Dominican Republic	1,600	4.4%	65%
6	Colombia	1,500	4.2%	70%
7	Ecuador	1,200	3.3%	73%
8	Venezuela (Bolivarian Republic of)	1,100	3.1%	76%
9	Guatemala	910	2.5%	79%
10	United States	710	2.0%	81%
11	Honduras	450	1.2%	82%
12	Bolivia (Plurinational State of)	390	1.1%	83%
	Others	6,176	17.1%	100%

Figure 11: Estimated prevalence of HIV infection among incident TB cases, Americas region, 2014[a]



[a] Countries with at least 100 incident TB cases; error bars show uncertainty ranges

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

Table 2: Estimated epidemiological burden of TB globally, by WHO region and by Americas subregion, 2014

a) Per absolute numbers in thousands

	Incidence		Prevalence	Mortality	MDR-TB*
	All forms	HIV-positive	All forms	HIV-negative	among notified PTB cases
North America	12	0.7	14	0.5	0.1
Caribbean	29	5.7	36	2.6	0.6
Mexico & Central America	47	3.9	65	3.0	0.8
South America (Andean)	82	8.2	109	4.3	3.0
South America (Other)	108	18	132	6.6	2.3
America	277	36	356	17	6.9
AFR	2,698	860	3,182	445	32
EMR	742	12	1,017	88	15
EUR	335	20	440	34	72
SEAR	4,054	210	5,371	449	99
WPR	1,563	31	2,096	88	71
World	9,671	1,169	12,462	1,119	300

b) Per 100 000 population

	Incidence		Prevalence	Mortality	MDR-TB*
	All forms	HIV-positive	All forms	HIV-negative	among notified PTB cases
North America	3.3	0.2	4.0	0.2	0.03
Caribbean	69	14	86	6.2	1.5
Mexico & Central America	28	2.3	38	1.8	0.5
South America (Andean)	60	6.0	80	3.1	2.2
South America (Other)	39	6.3	48	2.4	0.8
America	28	3.7	36	1.7	0.7
AFR	280	89	330	46	3.3
EMR	117	1.9	160	14	2.4
EUR	37	2.2	48	3.7	7.9
SEAR	213	11.0	282	24	5.2
WPR	85	1.7	114	4.8	3.9
World	134	16	172	15	4.1

AFR = African 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

Progress towards the 2015 Global Targets for TB Control

The year 2015 marks the final year of the current Global Plan to Stop TB 2011-2015 ("Global Plan") developed by WHO and the Stop TB Partnership.[7] The main global indicators and targets for TB control are based on Millennium Development Goal (MDG) 6 and the targets set in the Global Plan (**Box 4**), and include i) reducing TB incidence, prevalence and mortality, and ii) increasing TB case detection and treatment success. Additional targets were set in the Global Plan to address the specific challenges of multidrug-resistant TB (MDR-TB) and the TB/HIV co-epidemic.

This chapter summarizes the progress that was made in 2014 in the Americas, one year before the final target year. **Table 3** and **Table 4** highlight key findings at the regional, subregional and country level. More details on TB incidence, prevalence and mortality, case detection, treatment success, and the indicators addressing MDR-TB and TB/HIV can be found in different chapters of this report.

Box 4

Global targets and indicators for TB control to be met until 2015

Millennium Development Goal (MDG) 6:
Combat HIV/AIDS, malaria and other Diseases

Indicators in the MDG framework and associated targets: The indicators in the MDG framework are TB incidence, prevalence and mortality rates; the case detection rate; and the percentage of TB patients successfully treated. The Stop TB Partnership set targets to halve prevalence and mortality rates by 2015 compared with a baseline of 1990. In 1991, the World Health Assembly (WHA) set targets to detect at least 70% of incident cases and to successfully treat at least 85% of TB patients by 2000 (later reset to 2005); these WHA targets were not updated after 2005 but are still used for reference.

Table 3 shows the current progress towards the targets associated with MDG 6 in the Americas.

Global Plan to Stop TB 2011-2015 (additional targets):

Indicators and associated targets for the response to TB/HIV and MDR-TB: Key indicators for addressing the co-epidemics of TB/HIV are the proportion of TB patients who know their HIV status (target: 100%), the proportion of HIV-positive patients enrolled in antiretroviral treatment (ART; target: 100%) and the proportion of individuals newly enrolled in HIV care and eligibile for treatment for latent TB infection that are provided with isoniazid preventive therapy (IPT; target: 100%).
Key indicators for addressing the epidemic of MDR-TB are the proportion of MDR-TB cases that are detected and notified (target: 100%) and the treatment success rate among confirmed MDR-TB cases (target: ≥75%).

Table 4 shows the current progress towards the targets for the response to TB/HIV and MDR-TB in the Americas.

2.1. Reducing TB incidence, prevalence and mortality

The Region of the Americas has met the global targets for reducing TB incidence, prevalence and mortality before 2015 (**Table 3**). The mortality target was reached about ten years in advance of the target year.

TB incidence is declining in the region as a whole and in all five subregions except Mexico and Central America. In this subregion, only four countries (Costa Rica, Guatemala, Honduras and Panama) show a declining trend in TB incidence over the past five years.

TB prevalence in the Americas was 36 per 100 000 population in 2014, equivalent to a 56% reduction in TB prevalence since 1990 (82 per 100 000).

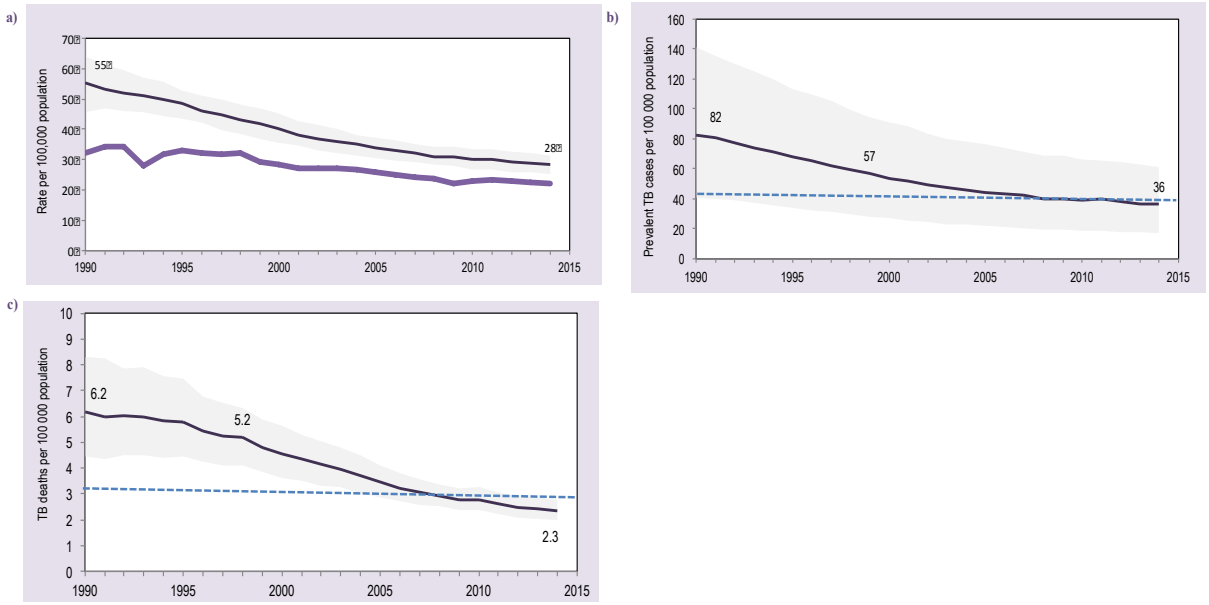
TB mortality was 2.3 per 100 000 population in 2014, equivalent to a 62% reduction in TB mortality since 1990 (6.2 per 100 000).

The encouraging regional trend in TB prevalence and mortality is mainly due to countries with high absolute numbers of TB cases and TB deaths, such as Brazil, Peru, Colombia and

[7] WHO. Global Plan to Stop TB, 2011–2015. Geneva; WHO 2010. (WHO/HTM/STB/2010.2). Available at: http://www.stoptb.org/assets/documents/global/plan/TB_GlobalPlanToStopTB2011-2015.pdf

Bolivia, having met (or are on track to meet) both targets for 2015. However, 18 of the 39 countries included in this report are currently not on track to halve TB prevalence; and 17 of 39 are not on track to halve TB mortality relative to 1990 (**Table 3 and Figure 12**).

Figure 12 a-c: Trend in **(a)** estimated TB incidence rate (thinner purple line with uncertainty interval) and TB case notification rate; **(b)** estimated prevalence; and **(c)** mortality rate, Americas region, 1990-2015. Blue dotted line represents 50% reduction in prevalence and mortality compared to 1990 levels.



2.2. Increasing case detection and treatment success

The Americas have met the target of 70% TB case detection, reaching 78% in 2014, along with all of its subregions and most countries (**Table 3**). The region has one of the highest estimated case detection rates globally.

The region is not likely to meet the global target for treatment success (85%). As of 2014, the treatment success rate in new and relapse cases was only 75%. The target was met only in five of the 39 countries included in this report (Bolivia, Costa Rica, El Salvador, Honduras and Saint Lucia); treatment success was below 70% in six of the remaining countries (Argentina, Belize, Chile, Guyana, Paraguay and Trinidad and Tobago) (**Table 3**).

2.3. Addressing the co-epidemic of TB/HIV

In the Americas, a growing number of TB patients know their HIV status. In 2014, the percentage of TB patients who were tested or knew their HIV status was 74% of those notified compared to 53% in 2009 (see Chapter 6, **Figure 26a**). Across the countries this percentage ranged from 16% to 99% in 2014.

In addition, 64% of all HIV-positive TB patients were on ART as reported by 29 countries. This percentage should be interpreted with caution, given that several countries with high absolute numbers of TB/HIV patients, including Brazil, did not report data.

Only 12 countries reported data on treatment for latent TB infection in HIV-positive people. In these countries, the percentage of people on IPT among those enrolled in HIV care ranged

from 0% to 97%. Regional trends over time in the scale up of ART and IPT cannot be assessed given the high number of countries not reporting data in 2014 (**Table 4**).

2.4. Addressing the MDR-TB epidemic

The Americas are unlikely to reach the 2015 targets for MDR-TB case detection and MDR-TB treatment success. In 2014, only 55% of the MDR-TB cases estimated among notified PTB cases in the region were detected. The proportion of cases detected varied substantially across countries. It was particularly low in three of the subregions: below 40% in the Caribbean and South America-Other subregions, and just above 40% in Mexico and Central America (**Table 4**).

The target of ≥75% treatment success in the 2012 cohort of MDR-TB patients was not reached in any of the subregions. The MDR-TB treatment success rate was 57% overall in the region and ranged across the countries from 34% to 100% (**Table 4**).

Table 3: Progress towards 2015 targets set within the MDG framework, Americas region [a]

MDG Framework (Indicators and Targets)						
Indicator		**TB Incidence Rate**	**TB Prevalence Rate**	**TB Mortality Rate**	**TB Case Detection Rate (%)**	**TB Treatment Success Rate: New and Relapse Cases, 2013 (%)**
Target		**Incidence Rate Falling**[1]	**50% Reduction in Prevalence Rate by 2015 compared with 1990**	**50% Reduction in Mortality Rate by 2015 compared with 1990**	**at least 70%**[2]	**at least 85%**[2] [3]
Region						
Americas		Met	Met	Met	78 (70-88)	75
Subregions						
North America		Met	Met	Met	89 (80-102)	83
Caribbean		Met	Almost met	Met	74 (65-83)	81
Mexico & Central America		Uncertain	Met	Met	72 (65-82)	83
South America (Andean)		Met	Met	Met	75 (65-91)	74
South America (Other)		Uncertain	Met	Met	83 (77-88)	70
Countries						
North America	Canada	Uncertain	Almost met	Almost met	84 (74-96)	82
	United States of America	Met	Met	Met	90 (80-100)	83
Caribbean	Antigua and Barbuda	Not met	Not met	Not met	44 (39-50)	-
	Aruba	Met	Not met	Not met	18 (16-20)	-
	Bahamas	Uncertain	Met	Not met	110 (98-130)	76
	Barbados	Met	Met	-	190 (170-220)	-
	Cuba	Uncertain	Met	Almost met	68 (60-79)	84
	Curaçao	Uncertain	-	-	-	-
	Dominica	Uncertain	Met	Met	190 (170-220)	-
	Dominican Republic	Met	Met	Not met	71 (63-80)	83
	Grenada	Met	Not met	-	-	-
	Haiti	Met	Not met	Met	75 (66-85)	81
	Jamaica	Met	Not met	Not met	66 (55-81)	77
	Puerto Rico	Met	Met	Met	86 (76-99)	73
	Saint Kitts and Nevis	Not met	Not met	-	-	-
	Saint Lucia	Uncertain	Almost met	Not met	36 (32-41)	100
	Saint Vincent and the Grenadines	Uncertain	Met	Not met	19 (16-23)	-
	Sint Maarten (Dutch part)	Uncertain	-	-	-	-
	Trinidad and Tobago	Uncertain	Not met	Not met	86 (76-98)	62
Mexico & Central America	Belize	Uncertain	Not met	Not met	55 (50-60)	36
	Costa Rica	Met	Met	Met	87 (77-99)	88
	El Salvador	Not met	Not met	Met	87 (80-95)	93
	Guatemala	Met	Not met	Almost met	34 (31-39)	84
	Honduras	Uncertain	Met	Met	82 (73-93)	89
	Mexico	Uncertain	Met	Met	81 (72-91)	80
	Nicaragua	Not met	Not met	Met	76 (70-82)	84
	Panama	Met	Not met	Not met	81 (68-100)	80
S. America (Andean)	Bolivia (Plurinational State of)	Met	Met	Met	64 (57-72)	85
	Colombia	Uncertain	Met	Met	76 (68-86)	71
	Ecuador	Met	Met	Not met	60 (46-82)	75
	Peru	Met	Met	Not met	81 (67-99)	79
	Venezuela (Bolivarian Republic of)	Met	Not met	Met	87 (77-99)	81
South America (Other)	Argentina	Uncertain	Almost met	Met	89 (78-100)	51
	Brazil	Uncertain	Met	Almost met	82 (78-86)	72
	Chile	Uncertain	Met	Met	85 (75-97)	47
	Guyana	Uncertain	Not met	Not met	69 (62-78)	67
	Paraguay	Met	Not met	Not met	80 (76-84)	68
	Suriname	Met	Met	Not met	73 (61-89)	77
	Uruguay	Not met	Not met	Not met	83 (73-95)	79
Legend		Met	Met	Met	≥ 70%	≥ 85%
		Uncertain [4]	Almost met [5]	Almost met [5]	55-69%	70-84%
		Not met [5]	Not met [5]	Not met [5]	< 55%	< 70%

[1] Anaylsis of trend is based on TB incidence for the past five years (2010-2014)

[2] The bands are defined according to the targets that existed when the MDGs were established.

[3] Data not shown for countries with a cohort size of less than 10 TB patients.

[4] "*Uncertain*" means that there was no statistically significant trend of TB incidence in the past five years. It is therefore uncertain whether the target will be reached in 2015. More information will be available in the 2016 report to determine if the target was met or not.

[5] "*Almost met*" means 40-49% reduction, " *Not met*" means no or less than 40% reduction in the burden indicator in 2014 relative to 1990

[a] 2014 data unless otherwise specified

Table 4: Progress towards 2015 targets for TB/HIV and MDR-TB set by the Global Plan to Stop TB, Americas region, 2011–2015 [a]

		TB/HIV: 2015 Global plan targets			MDR-TB: 2015 Global plan targets	
Indicator		TB Patients with Known HIV Status (%) [1]	Notified HIV-Positive TB Patients Started on ART (%) [1]	People Living with HIV Newly Enrolled in HIV Care who where Started on IPT (%) [1] [2]	Estimated MDR-TB cases that were detected and notified [1] [3] [4]	Treatment Success Rate: Confirmed MDR-TB cases, 2012 cohort (%) [1]
Target		100	100	50	100	≥75
Region						
Americas		74	64		55	57
Subregions						
North America		82			>100	60
Caribbean		85	62		31	73
Mexico & Central America		86	74		41	72
South America (Andean)		76	60		74	58
South America (Other)		64	60		38	49
Countries						
North America	Canada	51				-
	United States of America	87			98	59
Caribbean	Antigua and Barbuda	-	-	2.0		-
	Aruba					
	Bahamas	56	80			-
	Barbados	-	-			-
	Cuba	99	83	71		-
	Curaçao	-	-	-	-	-
	Dominica	-	-			-
	Dominican Republic	73	85	64	62	72
	Grenada	-				
	Haiti	88	54	97	20	76
	Jamaica	92	95			-
	Puerto Rico	89	-			-
	Saint Kitts and Nevis	-	-			-
	Saint Lucia	-	-	0.0		-
	Saint Vincent and the Grenadines			6.0		
	Sint Maarten (Dutch part)	-	-			-
	Trinidad and Tobago	99	56		0.0	-
Mexico & Central America	Belize	72	100		0.0	-
	Costa Rica	94	100			-
	El Salvador	98	84	63		100
	Guatemala	86	93		48	69
	Honduras	88	82	23	19	-
	Mexico	85	59	3.0	40	74
	Nicaragua	81	-	13	36	90
	Panama	99	95		69	42
S. America (Andean)	Bolivia (Plurinational State of)	77	68		52	67
	Colombia	80	38		52	48
	Ecuador	88	100	15	>100	54
	Peru	74	66	38	73	60
	Venezuela (Bolivarian Republic of)	70	83		17	52
South America (Other)	Argentina	16			32	34
	Brazil	70			39	51
	Chile	50	31		100	-
	Guyana	91	70	7.0	14	-
	Paraguay	79	87	0.0	18	-
	Suriname	97	73			-
	Uruguay	91	52			-
Legend		≥ 95%	≥ 95%	≥ 75%	≥ 95%	≥ 85%
		80-94%	80-94%	50-74%	70-94%	75-84%
		50-79%	50-79%	25-49%	50-69%	50-74%
		< 50%	< 50%	< 25%	< 50%	< 50%

[1] Data not shown for countries with a cohort size of less than 10 individuals (-) or without numerator or denominator. Blank cells indicate no data available.

[2] Approximately 50% of patients newly enrolled in HIV care are expected to be eligible for IPT.

[3] The numerator is the number of notified rifampicin-resistant and MDR-TB cases. The denominator is the estimated number of MDR-TB cases among notified.

[4] The denominator (i.e. estimated number of MDR-TB cases) may be too low for countries with more than 100% MDR-TB cases detected.

[a] 2014 data unless otherwise specified

Chapter 3

TB Case Notification, Detection Rate and Treatment Outcomes

Recording and reporting of TB cases and monitoring of treatment outcomes represent cornerstones of TB control programs worldwide. This chapter provides an overview on TB case notification, detection rate and treatment outcomes in the Americas based on the data collected and submitted by 39 PAHO/WHO member states and associated members and information on the TB case reports submitted by 7 territories in the Americas.

3.1. Case notification

In 2013, the WHO definitions of TB cases were revised to take into consideration the worldwide introduction of rapid molecular diagnostics and the scale-up of treatment for DR-TB. **Box 5** provides an overview of the WHO case definitions recommended for use since March 2013. Data on TB case notifications by age and sex are now being reported for new and relapse cases combined.

In 2014, about 228 000 TB cases were reported in the Americas, a rate of 23 per 100 000 population. Notifications of different categories of TB cases in the Americas are summarized in **Table 5**.

Box 5

WHO definitions of TB cases recommended for use since March 2013 and that were used in the 2015 round of TB data collection in the Americas and globally[a]

Bacteriologically confirmed case of TB A patient from whom a biological specimen is positive by smear microscopy, culture or WHO-approved rapid diagnostic test (such as Xpert MTB/RIF). All such cases should be notified, regardless of whether TB treatment is started.

Clinically diagnosed case of TB A patient who does not fulfil the criteria for bacteriologically confirmed TB but has been diagnosed with active TB by a clinician or other medical practitioner who has decided to give the patient a full course of TB treatment. This definition includes cases diagnosed on the basis of X-ray abnormalities or suggestive histology and extrapulmonary cases without laboratory confirmation. Clinically diagnosed cases subsequently found to be bacteriologically positive (before or after starting treatment) should be reclassified as bacteriologically confirmed.

Case of pulmonary TB Any bacteriologically confirmed or clinically diagnosed case of TB involving the lung parenchyma or the tracheobronchial tree. Miliary TB is classified as pulmonary TB because there are lesions in the lungs. Tuberculous intra-thoracic lymphadenopathy (mediastinal and/or hilar) or tuberculous pleural effusion, without radiographic abnormalities in the lungs, constitute a case of extrapulmonary TB. A patient with both pulmonary and extrapulmonary TB should be classified as a case of pulmonary TB.

Case of extrapulmonary TB Any bacteriologically confirmed or clinically diagnosed case of TB involving organs other than the lungs, e.g. pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, meninges.

New case of TB A patient who has never been treated for TB or has taken anti-TB drugs for less than one month. Re-treatment cases are further classified by the outcome of their most recent course of treatment into four categories.

1. Relapse patients have previously been treated for TB, were declared cured or treatment completed at the end of their most recent course of treatment, and are now diagnosed with a recurrent episode of TB (either a true relapse or a new episode of TB caused by reinfection).
2. Treatment after failure patients have previously been treated for TB and their most recent course of treatment failed i.e. they had a positive sputum smear or culture result at month 5 or later during treatment.
3. Treatment after loss to follow-up patients have previously been treated for TB and were declared 'lost to follow-up' at the end of their most recent course of treatment.
4. Other previously treated patients are those who have previously been treated for TB but whose outcome after their most recent course of treatment is unknown or undocumented.

Case of multidrug-resistant TB (MDR-TB) TB that is resistant to two first-line drugs: isoniazid and rifampicin. For most patients diagnosed with MDR-TB, WHO recommends treatment for 20 months with a regimen that includes second- line anti-TB drugs.

Case of rifampicin-resistant TB (RR-TB) A patient with TB that is resistant to rifampicin detected using phenotypic or genotypic methods, with or without resistance to other anti-TB drugs. It includes any resistance to rifampicin, whether mono-resistance, multidrug-resistance, polydrug-resistance or extensive drug-resistance.

[a] Sources: WHO Global TB report 2014 / Definitions and reporting framework for tuberculosis – 2013 revision. Geneva, World Health Organization, 2013 (WHO/HTM/TB/2013.2). Available at: http://www.who.int/tb/publications/definitions/en/.

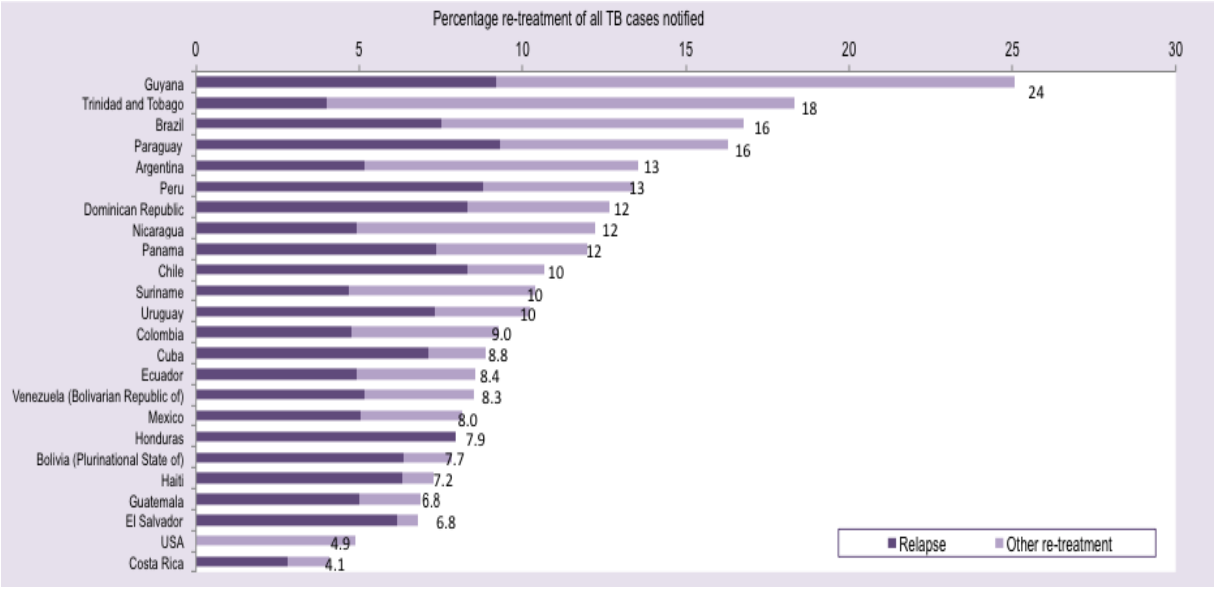
Table 5: TB case notifications, Americas region, 2014

		Total Notified	New and Relapse	Retreatment Excl. Relapse	New or Treatment History Unknown			Relapse		
					Pulmonary Bacteriol. confirmed	Pulmonary Clinically Diagnosed	Extra-Pulmonary	Pulmonary Bacteriol. confirmed	Pulmonary Clinically Diagnosed	Extra-Pulmonary
Region										
	Americas	229,896	216,793	13,103	128,763	40,896	32,924	10,191	2,921	1,040
Subregions										
	North America	10,975	10,517	458	6,757	1,380	2,300			
	Caribbean	21,818	21,405	413	13,091	4,741	2,142	991	359	81
	Mexico & Central America	34,938	34,009	929	21,227	5,311	5,634	1,417	267	153
	South America (Andean)	64,064	61,511	2,553	37,547	8,401	11,271	3,468	595	229
	South America (Other)	98,101	89,351	8,750	50,141	21,063	11,577	4,315	1,697	558
Countries										
North America	Canada	1,568	1,568	0	919	146	423	58	3	19
	United States of America	9,407	8,949	458	5,838	1,234	1,877	0	0	0
Caribbean	Antigua and Barbuda	3	3	0	2	1	0	0	0	0
	Aruba	2	2		2	0	0			
	Bahamas	50	50	0	25	20	1	2	2	0
	Barbados	5	5	0	3	1	1	0	0	0
	Dominica	1	1	0	0	1	0	0	0	0
	Cuba	742	729	13	467	130	80	41	7	4
	Curaçao	5	5	0	4	1	0	0	0	0
	Dominican Republic	4,605	4,405	200	2,630	926	483	300	64	2
	Grenada	0	0	0	0	0	0	0	0	0
	Haiti	15,963	15,806	157	9,747	3,521	1,541	641	281	75
	Jamaica	86	86	0	34	44	6	2	0	0
	Puerto Rico	44	44	0	39	0	5	0	0	0
	Saint Kitts and Nevis	7	7	0	1	6	0	0	0	0
	Saint Lucia	6	6	0	5	1	0	0	0	0
	Sint Maarten (Dutch part)	0	0	0	0	0	0	0	0	0
	Saint Vincent and the Grenadines	6	5	1	4	1	0	0	0	0
	Trinidad and Tobago	293	251	42	128	88	25	5	5	0
Mexico & Central America	Belize	87	72	15	33	29	8	2		0
	Costa Rica	469	463	6	380	7	63	10	0	3
	El Salvador	2,220	2,206	14	1,564	215	291	134	0	2
	Guatemala	3,224	3,163	61	2,103	550	352	132	15	11
	Honduras	2,820	2,820	0	1,810	380	406	180	22	22
	Mexico	21,881	21,196	685	13,177	3,060	3,892	779	192	96
	Nicaragua	2,709	2,632	77	1,447	717	338	130	0	0
	Panama	1,528	1,457	71	713	353	284	50	38	19
S. America (Andean)	Bolivia (Plurinational State of)	8,201	8,079	122	5,476	449	1,642	428	32	52
	Colombia	12,435	11,875	560	7,073	1,949	2,289	415	117	32
	Ecuador	5,352	5,157	195	3,649	341	913	254	0	0
	Peru	31,461	30,008	1,453	17,823	4,204	5,348	2,128	366	139
	Venezuela (Bolivarian Republic of)	6,615	6,392	223	3,526	1,458	1,079	243	80	6
South America (Other)	Argentina	10,038	9,195	843	5,249	2,218	1,255	319	107	47
	Brazil	81,512	73,970	7,542	41,120	17,801	9,479	3,602	1,488	480
	Chile	2,440	2,383	57	1,481	237	467	158	15	25
	Guyana	648	545	103	284	153	58	19	31	0
	Paraguay	2,417	2,247	170	1,371	458	209	163	42	4
	Suriname	158	149	9	100	16	26	4	2	1
	Uruguay	888	862	26	536	180	83	50	12	1

3.1.1. Case notification by treatment history

Of the 230 000 TB cases notified in 2014 in the Americas, around 27 300 (12%) were re-treatment cases. Of these, 14 152 (52%) were classified as relapse and 13 100 (48%) as "other" re-treatment cases. At the country level, the proportion of re-treatment among all notified TB cases varied from 4.1% to 24% (**Figure 13**).

Figure 13: Proportion of re-treatment TB cases amongst all notified cases, Americas region, 2014[a]

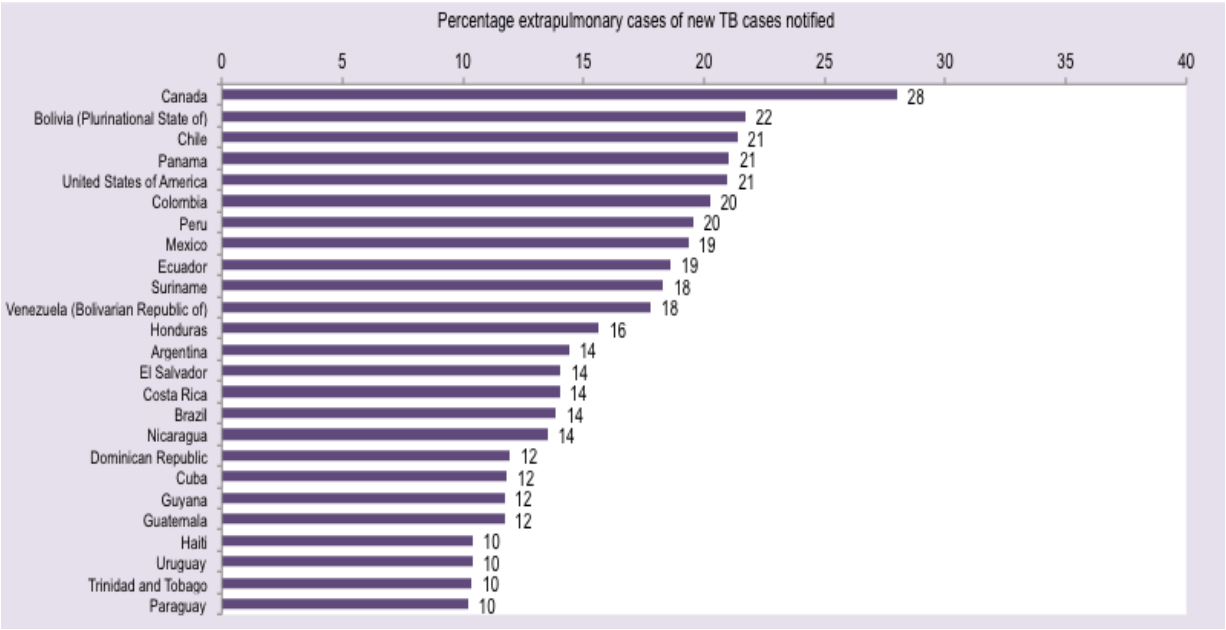


[a] Countries with at least 100 TB cases notified

3.1.2. Case notification by site of disease

Of the 216 793 new TB cases notified, about 169 600 (84%) were pulmonary TB (PTB) cases and 32 900 (16%) were extrapulmonary tuberculosis (EPTB) cases. At the country level, the proportion of EPTB among new cases varied between 10% and 28% (**Figure 14**). High variation in the proportion of EPTB cases across countries may be due to capacity to diagnose EPTB.

Figure 14: Proportion of EPTB among new cases, Americas region, 2014[a]

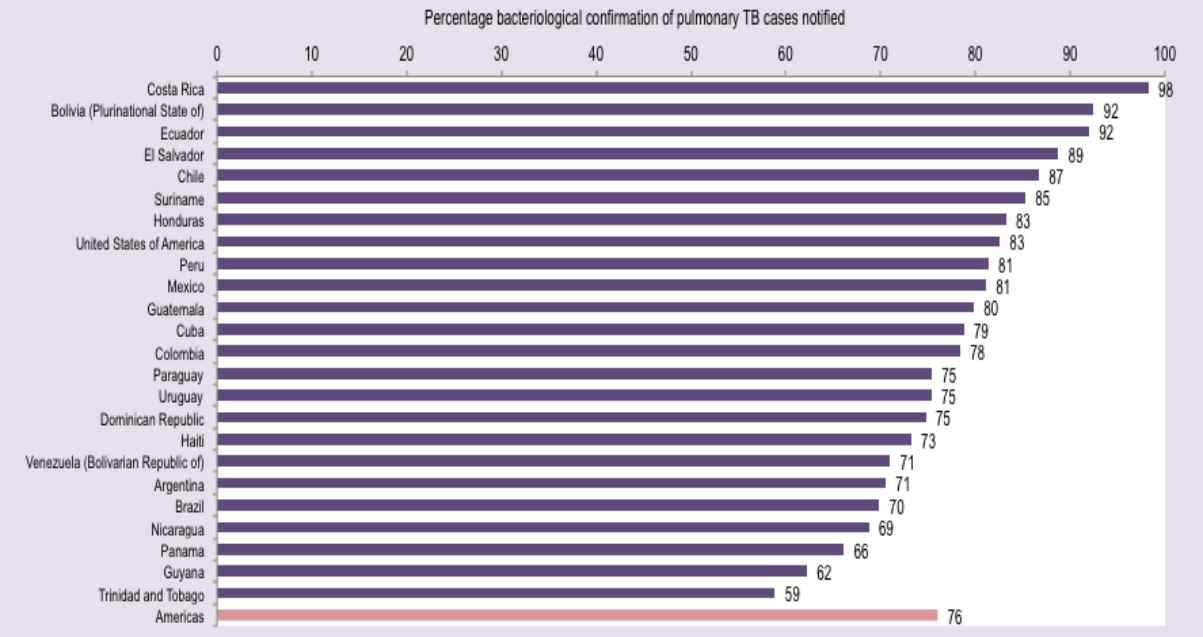


[a] Countries with at least 100 TB cases notified

3.1.3. Case notification by bacteriology

Of 187 800 (new and relapse) PTB cases notified, 139 000 (76%) were bacteriologically confirmed and 43 800 (24%) were clinically diagnosed. The proportion of bacteriologically confirmed PTB varied at country level between 59% and 98% (**Figure 15**).

Figure 15: Proportion of cases with bacteriological confirmation amongst new and relapse PTB cases, Americas region, 2014[a]



[a] Countries with at least 100 TB cases notified

3.1.4. Case notification by age and sex

In 2014, 37 countries in the Americas reported data by age group and sex, and 33 of 37 countries included relapse cases into their age and sex-specific case reports. Age group and sex was reported for a total of 210 400 new and relapse cases in the Americas, representing 97% of all new and relapse TB cases notified in 2014 (**Table 5**).

Of the 210 400 TB cases with available data, 77 780 were female (37%).

Figure 16 shows rates of new and relapse TB cases per 100 000 population by age and sex in the Americas region overall and in each of its five subregions.[8]

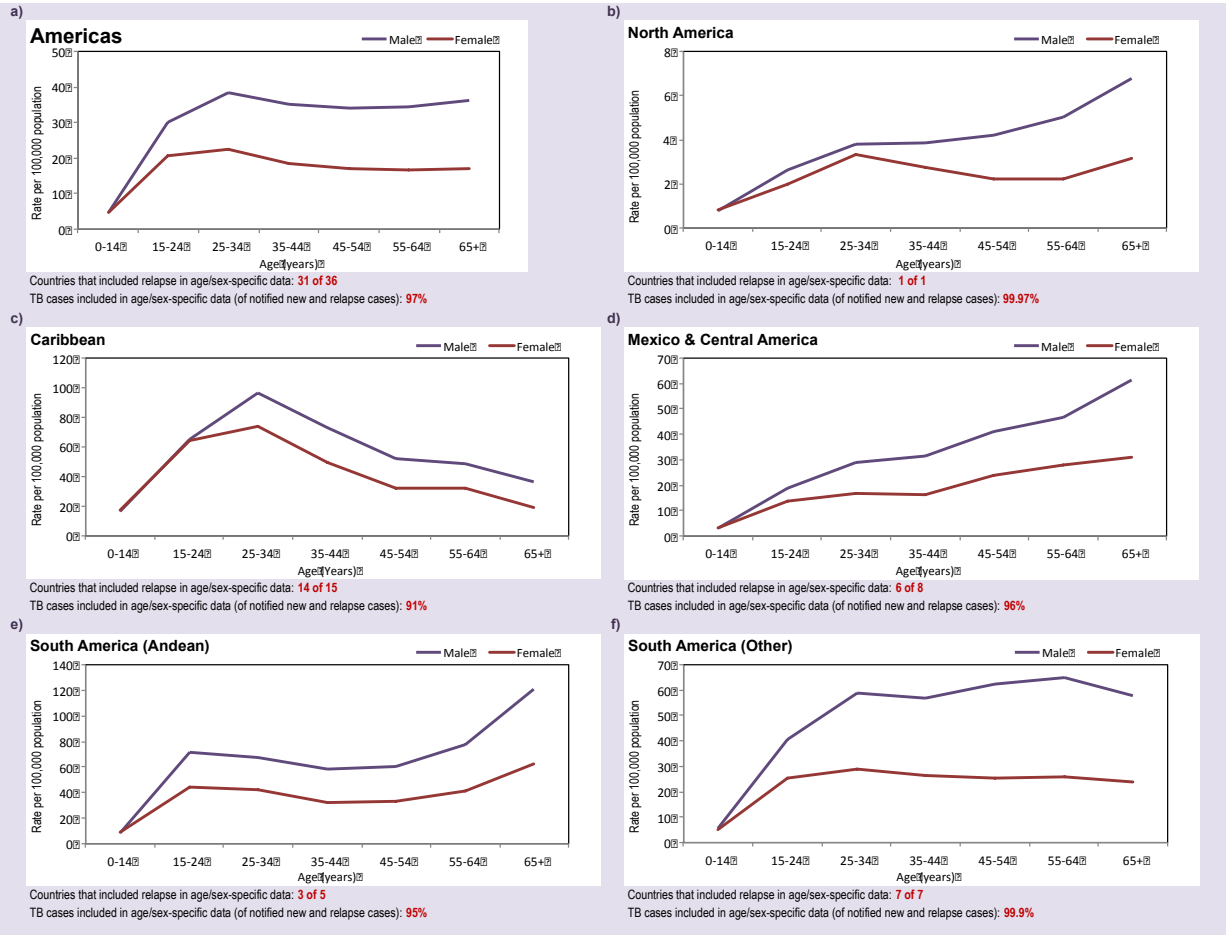
TB rates in the Americas vary considerably by age group and sex which may be due to age and sex-specific differences in case detection, recording and reporting, and in TB incidence. At the regional level (**Figure 16a**) notification rates are lowest among children (0-14 years old) and highest among young adults (25-34 years old). TB rates amongst children are similar in males and females, but higher in young adolescent and adult males.

[8] Age- and sex-specific TB rates for new and relapse cases were estimated using United Nations population estimates (by equal age groups and sex) for the year 2014. The rates represent underestimates of the true TB notification rates because not all countries included relapse along with new cases in age and sex-specific case reports, and, because there were notified new and relapse cases for whom age and sex-specific information was not available. The number of countries that included relapse cases, and the number of cases with age and sex-specific information as percentage of the total number of new and relapse cases are shown under each graph in **Figure 15 a-e**.

Distributions of age- and sex-specific TB rates at the subregional level show considerable heterogeneity (**Figure 16b-f**). In the Caribbean, notification rates are highest in young adults (25-34 years old) and decrease thereafter; this finding may be related to the association of TB risk in this age group with the concurrent HIV epidemic. Notification rates in other subregions either show a second peak in older age (in females in North America, and in both males and females in South America-Andean); a constant increase with age (in males in North America, in both males and females in Mexico and Central America); or a relatively constant level across adult age groups (in South America-Other). The increase in older age both in males and females in Mexico and Central America and in South America (Andean) warrants further investigation.

Similarly, across all subregions, sex differences in notification rates appear greater in medium (and senior) adult age with higher rates observed in males. TB rates in males and females appear more similar in children and younger adults (0-14 and 15-24 years old) (**Figure 16b-f**).

Figure 16 a-f: Age- and sex-specific rates of new and relapse TB cases, Americas region and five subregions, 2014



3.1.5. Case notification in territories

Seven territories contribute to TB case notification in the Americas (Anguilla; Bermuda; British Virgin Islands; Bonaire, Saint Eustatius and Saba; Cayman Islands, Montserrat; Turks and Caicos Island). In 2014, a total of 2 cases were notified in these territories (0.9 per 100 000 population) (**Box 6**).

Box 6: TB case notification in 7 territories in the Americas, 2014

Territory	Population	TB cases notified	Rate per 100,000
Anguilla	14,460	1	6.9
Bermuda	62,376	0	-
Bonaire, Saint Eustatius and Saba	24,313	0	-
British Virgin Islands	29,585	0	-
Cayman Islands	59,172	0	-
Montserrat	5,094	0	-
Turks and Caicos Islands	33,740	1	3.0
TOTAL	**228,740**	**2**	**0.9**

3.2. Case detection rate

The case detection rate (CDR) for TB is one of the target indicators for global TB control (see Chapter 2, **Box 4**). It is defined as the number of new and relapse TB cases notified by National TB Programs (NTPs) divided by the number of incident cases estimated per year.

In 2014, the estimated CDR in the Americas was 81% (uncertainty range: 72%-90%). It was highest in the North America subregion (84%; uncertainty: 76%-97%) and lowest in the Mexico and Central America subregion (72%; uncertainty: 65%-82%) (**Table 6**).

A comparison of the trends in TB case notification rate (new and relapse cases) and estimated TB incidence rate over time in the Americas and the five subregions is shown in **Figure 17**. Case detection is inversely associated with the "gap" between both rates, i.e. the greater the gap the lower the CDR. It is estimated that the CDR in the Americas has increased in the past years, particularly in the Caribbean and South America-Other subregions (**Table 6** and **7** and **Figure 17**). The existing gap between estimated and notified cases needs to be decreased in order to achieve effective TB control.

Table 6: TB case detection rates (and uncertainty ranges), Americas region, 1995 – 2014*

		1995		2000		2005		2010		2014	
Region											
	Americas	68	(63-76)	71	(63-80)	76	(70-85)	76	(68-85)	81	(72-90)
Subregions											
	North America	87	(78-103)	86	(74-96)	88	(78-100)	85	(74-100)	84	(76-97)
	Caribbean	40	(37-42)	52	(48-57)	61	(56-64)	62	(57-69)	74	(65-83)
	Mexico & Central America	42	(40-46)	64	(59-72)	73	(68-79)	74	(66-82)	72	(65-82)
	South America (Andean)	74	(63-87)	74	(62-87)	72	(62-85)	74	(62-88)	75	(65-91)
	South America (Other)	77	(76-85)	72	(67-82)	84	(80-91)	81	(76-87)	83	(77-88)
Countries											
North America	Canada	86	(76-99)	85	(75-97)	86	(76-99)	78	(69-90)	84	(74-96)
	United States of America	89	(79-100)	85	(75-97)	87	(77-100)	86	(76-98)	90	(80-100)
Caribbean	Antigua and Barbuda			120	(100-130)	170	(150-200)	140	(120-160)	44	(39-50)
	Aruba							47	(41-53)	18	(16-20)
	Bahamas	69	(61-79)	110	(94-120)	87	(77-99)	66	(58-75)	110	(98-130)
	Barbados	76	(67-86)	46	(40-52)			87	(77-100)	190	(170-220)
	Cuba	76	(70-83)	83	(76-90)	74	(69-81)	79	(71-89)	68	(60-79)
	Curaçao							87	(77-99)	87	(77-99)
	Dominica	87	(77-99)					87	(77-99)	190	(170-220)
	Dominican Republic	42	(39-46)	62	(57-68)	66	(62-71)	60	(54-66)	71	(63-80)
	Grenada	130	(110-160)					99	(82-120)		
	Haiti	32	(30-35)	45	(42-49)	57	(53-61)	62	(56-69)	75	(66-85)
	Jamaica	66	(54-81)	75	(62-92)	59	(49-72)	85	(71-100)	66	(55-81)
	Puerto Rico	92	(82-110)	88	(78-100)	91	(80-100)	96	(85-110)	86	(76-99)
	Saint Kitts and Nevis	88	(78-100)					65	(57-74)	180	(160-200)
	Saint Lucia	43	(38-49)	48	(42-54)	87	(77-99)	87	(77-99)	36	(32-41)
	Saint Vincent and the Grenadines	45	(38-55)	57	(48-70)	26	(21-31)	56	(47-68)	19	(16-23)
	Sint Maarten (Dutch part)							87	(77-99)		
	Trinidad and Tobago	81	(72-93)	92	(81-100)	75	(66-85)	78	(69-89)	86	(76-98)
Mexico & Central America	Belize	97	(92-100)	72	(68-76)	96	(91-100)	130	(120-130)	55	(50-60)
	Costa Rica	70	(66-75)	76	(70-83)	78	(72-83)	85	(76-95)	87	(77-99)
	El Salvador	84	(80-88)	92	(88-96)	97	(93-100)	86	(80-93)	87	(80-95)
	Guatemala	42	(39-46)	37	(34-40)	45	(42-48)	37	(33-41)	34	(31-39)
	Honduras	78	(68-90)	90	(77-110)	66	(57-77)	82	(73-93)	82	(73-93)
	Mexico	28	(26-30)	62	(58-68)	81	(76-87)	83	(75-91)	81	(72-91)
	Nicaragua	87	(84-91)	86	(81-91)	81	(77-85)	86	(80-93)	76	(70-82)
	Panama	89	(74-110)	62	(52-77)	79	(66-98)	78	(64-95)	81	(68-100)
S. America (Andean)	Bolivia (Plurinational State of)	89	(83-95)	66	(60-72)	68	(63-73)	62	(56-70)	64	(57-72)
	Colombia	55	(51-60)	67	(62-73)	62	(58-67)	72	(65-80)	76	(68-86)
	Ecuador	54	(41-74)	55	(42-76)	46	(35-63)	55	(42-76)	60	(46-82)
	Peru	79	(66-97)	81	(67-99)	81	(67-100)	80	(66-98)	81	(67-99)
	Venezuela (Bolivarian Republic of)	86	(76-99)	88	(78-100)	90	(79-100)	86	(76-98)	87	(77-99)
South America (Other)	Argentina	89	(79-100)	86	(76-98)	88	(78-100)	72	(64-82)	89	(78-100)
	Brazil	79	(73-85)	73	(67-80)	84	(79-90)	82	(78-86)	82	(78-86)
	Chile	85	(75-97)	85	(75-97)	90	(79-100)	87	(77-99)	85	(75-97)
	Guyana	46	(43-50)	55	(51-60)	75	(70-80)	86	(77-95)	69	(62-78)
	Paraguay	70	(68-72)	75	(72-78)	73	(71-75)	82	(78-86)	80	(76-84)
	Suriname			21	(18-26)	38	(33-44)	80	(66-99)	73	(61-89)
	Uruguay	80	(71-92)	86	(76-99)	87	(77-99)	84	(74-96)	83	(73-95)

* Estimates are not available for some Caribbean countries with very low TB burden and some percentages may exceed 100%

Figure 17 a-f: Comparison of estimated TB incidence rate (thinner line with uncertainty interval) and TB case notification rate by region and subregion, Americas region, 1990 – 2014

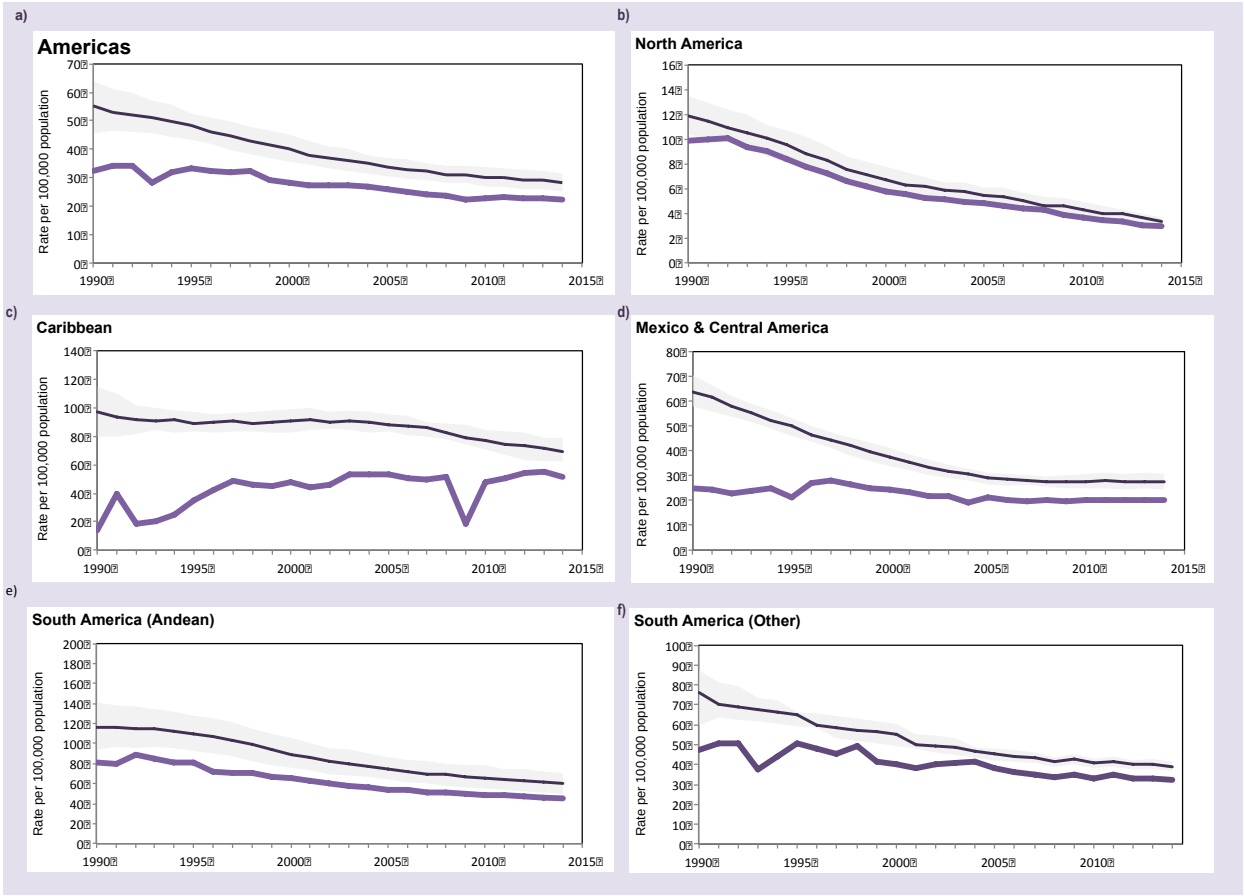


Table 7: Top 12 countries with gap in TB notifications, Americas region, 2014

#	Country	Estimated number of cases	Notified new and relapse cases	Gap in notifications (n)	Gap in notifications compared to total gap (%)
1	Brazil	90,000	73,970	16,030	27
2	Peru	37,000	30,008	6,992	12
3	Guatemala	9,200	3,163	6,037	10
4	Haiti	21,000	15,806	5,194	8.6
5	Bolivia (Plurinational State of)	13,000	8,079	4,921	8.1
6	Mexico	26,000	21,196	4,804	7.9
7	Colombia	16,000	11,875	4,125	6.8
8	Ecuador	8,600	5,157	3,443	5.7
9	Dominican Republic	6,200	4,405	1,795	3.0
10	United States of America	9,900	8,949	951	1.6
11	Venezuela (Bolivarian Republic of)	7,300	6,392	908	1.5
12	Nicaragua	3,500	2,632	868	1.4
	Others	29,541	25,161	4,380	7.2
	Total	277,241	216,793	60,448	100

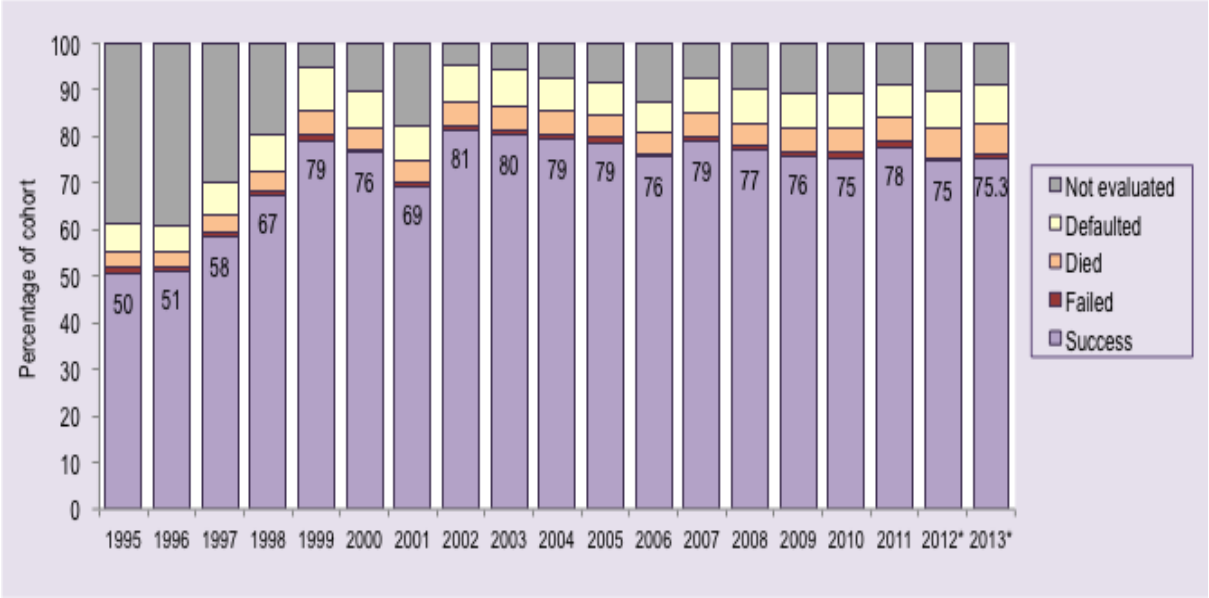
3.3. Treatment outcomes

In 2013, a total of 220 300 new and relapse cases were notified in the Americas. Treatment outcomes were reported for a total of 202 385 new and relapse patients (2013 cohort), representing 92% of cases notified in 2013.[9]

Of the TB patients included in the 2013 cohort, 151 100 (75.3%) were successfully treated; 1 303 (0.6%) failed their treatment; 13 635 (6.7%) died; and 16 439 (8.1%) were lost to follow-up. Treatment outcomes were not evaluated for 18 596 patients (9.2%).

Treatment success was similar to the 2012 cohort but slightly lower compared to previous years given a higher proportion of patients who were lost to follow up (8.1% compared to 7.2% in the 2011 cohort and 7.7% in the 2012 cohort); this is most likely due to the inclusion of relapse cases in the treatment outcome data for the 2012 and 2013 cohorts (**Figure 18**).

Figure 18: Treatment outcomes in new TB cases, by annual cohort, Americas region, 1995 - 2013 cohorts

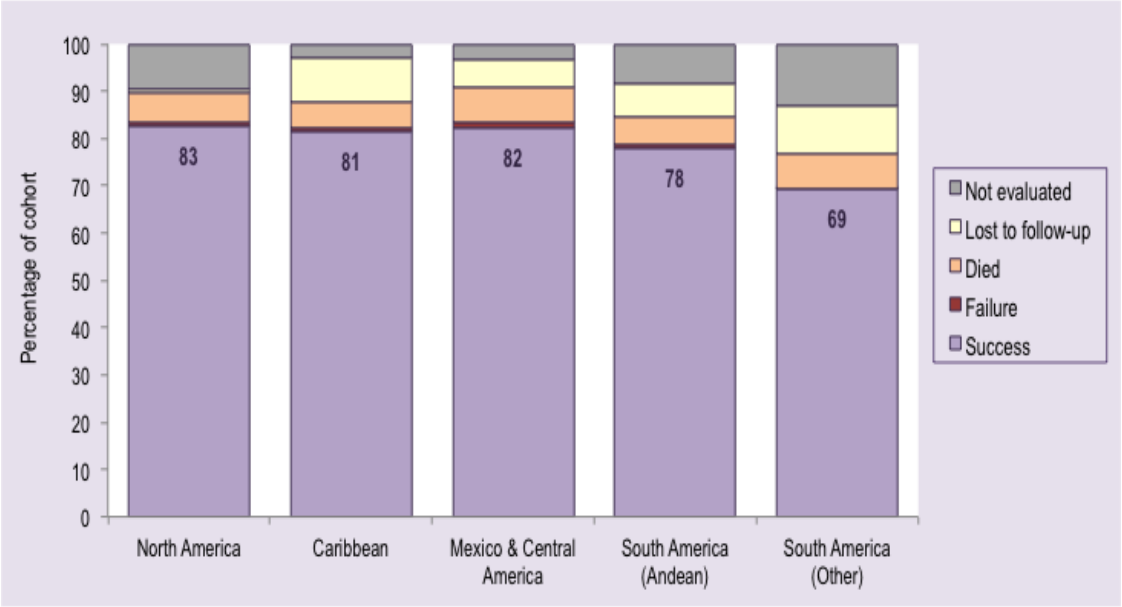


* The 2012 and 2013 treatment cohorts include new as well as relapse cases (versus previous years' cohorts that included only new cases)

At the subregional level, treatment success varied between 69% (in South America-Other) and 83% (in North America) (**Figure 19**).

[9] During the previous round of TB data collection in 2014, treatment cohorts included all new and relapse cases for the first time, regardless of bacteriological confirmation. In the Americas, a small number of countries did not (yet) include relapse cases in 2015. Those countries are marked in the figures.

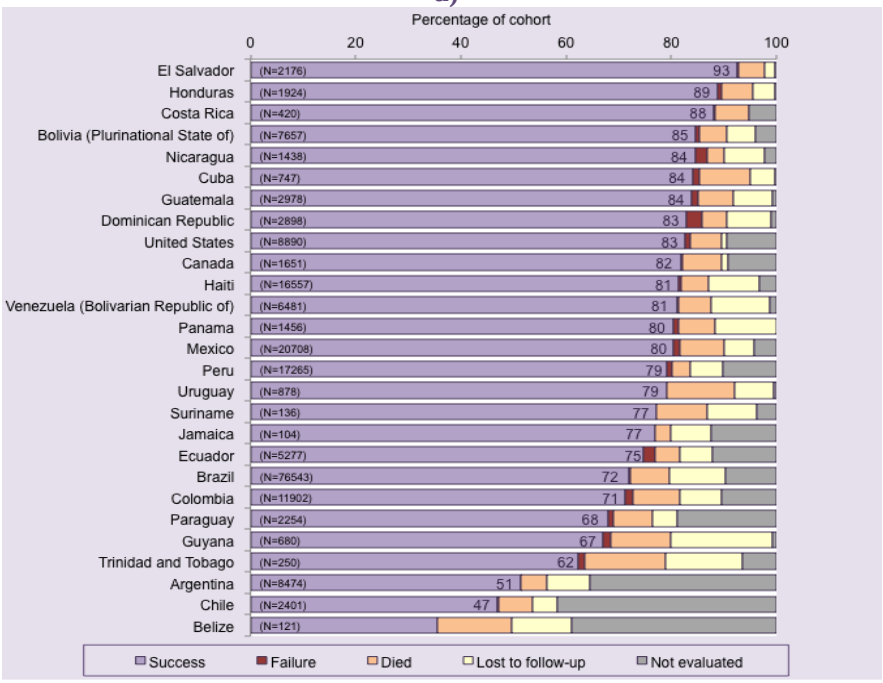
Figure 19: Treatment outcomes for new and relapse cases in five subregions, annual cohort, Americas region, 2013 cohort



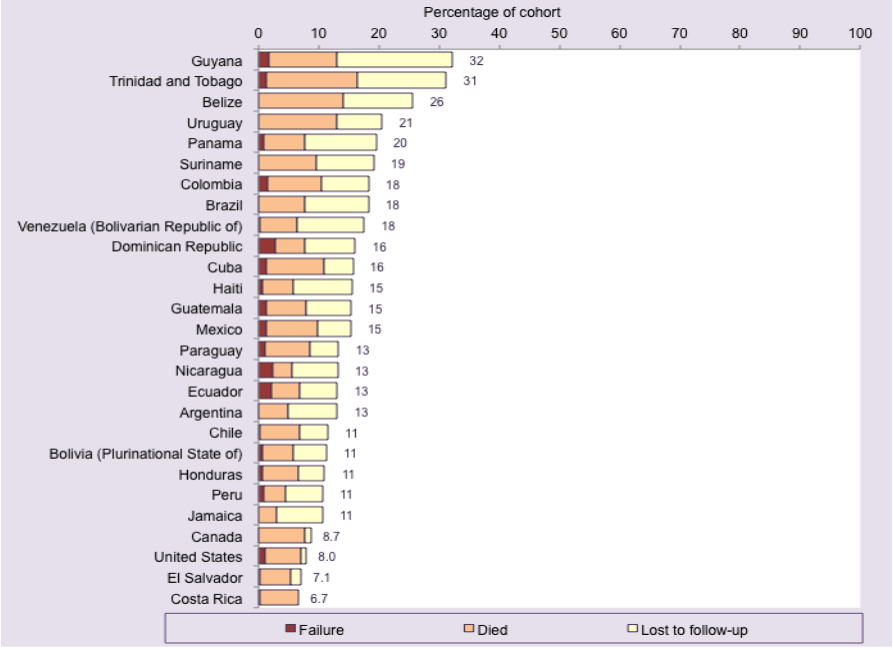
Amongst the 26 countries with at least 50 TB patients treated in the 2013 cohort, treatment success rates for new and relapse rates varied between 36% and 93% (**Figure 20a**). Five countries reported unfavorable treatment outcomes for 20% of patients or more (**Figure 20b**). The proportion of patients who died during TB treatment was particularly high in Trinidad and Tobago (38 of 250 patients or 15%) and Belize (17 of 121 or 14%).

Figure 20 a-b: Treatment outcomes amongst new and relapse cases: (a) all (numbers in brackets show cohort size); (b) proportions with unfavorable outcomes (failure, died, default), annual cohort, Americas region, 2013

a)



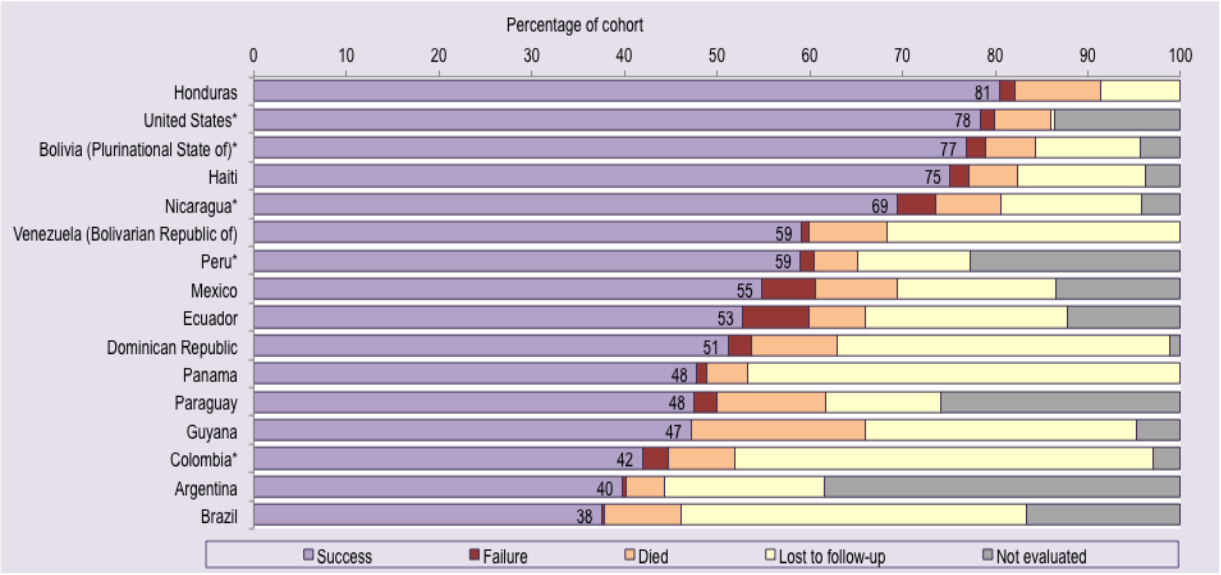
b)



*Country reported new cases only
[a] Countries with a cohort size < 50 TB cases not included

Treatment outcomes in re-treatment TB patients other than relapse were less favorable compared to those amongst new and relapse cases. Among 16 countries with at least 50 TB patients treated in the 2013 cohort, treatment success rates for re-treatment cases other than relapse varied between 38% and 81% (**Figure 21**).

Figure 21: Treatment outcomes amongst re-treatment cases (excluding relapse, unless indicated otherwise), annual cohort, Americas region, 2013[a]



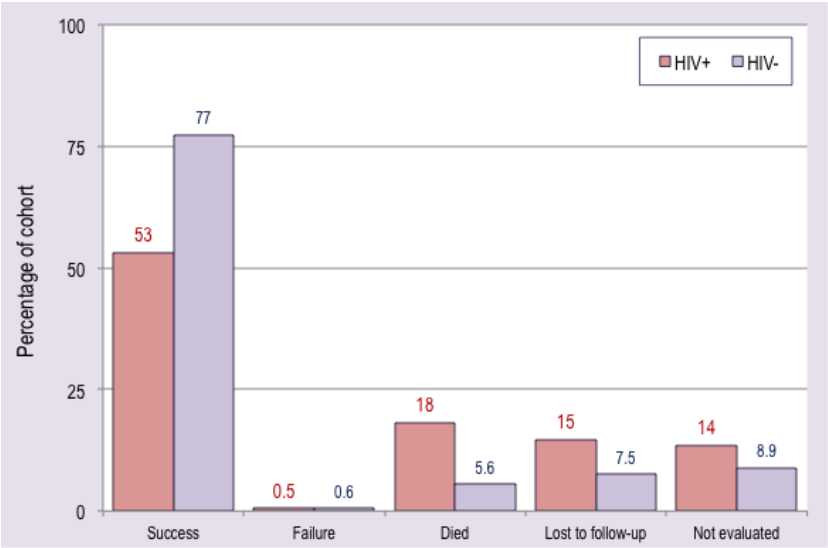
*Country included relapse cases in the cohort

[a] Countries with a cohort size of less than 50 TB cases not included

Treatment outcomes in HIV-positive TB patients were less favorable compared to HIV-negative TB patients. In countries with available data[10], treatment success in HIV-positive TB patients (new and relapse) was 53% compared to 77% in HIV-negative patients (**Figure 22**).

Treatment outcomes for MDR-TB patients are shown in Chapter 5.

Figure 22: Treatment outcomes by HIV status (new and relapse cases), annual cohort, Americas region, 2013[a]



[a] 31 countries reporting data on treatment outcome in HIV-positive and -negative patients

10 Data on treatment results by HIV status (2013 cohort) were reported by NTP programs from 31 of the 39 countries analysed in this report, for a total of 186 359 patients.

Chapter 4

TB Diagnostics and Laboratory Strengthening

Strengthening laboratory capacity and improving access to rapid diagnostics to ensure timely confirmation of TB and determination of drug-resistance remain priorities for TB control in the Americas.

4.1. Strengthening of laboratory capacity

Regional targets have been agreed by the PAHO member states to strengthen laboratory capacity throughout the Americas (**Box 7**). Within the network of the Global Laboratory Initiative[11], supranational reference laboratories situated in Atlanta and Boston (United States), Buenos Aires (Argentina), Guadeloupe (France), Mexico City (Mexico) and Santiago (Chile) serve to provide external quality assurance (EQA) to laboratories in the Americas. National reference laboratories for TB have been established in 33 of the 39 countries included in this report.

Box 7

Targets for TB laboratory capacity in the Americas:

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

All 23 countries with higher TB burden that were requested to provide detailed information on laboratories reported data for laboratory capacity and EQA in 2014. These countries accounted for 95% of the estimated incident TB cases in the Americas.

Laboratory capacity for smear microscopy was below the regional target in 4 of the 23 countries, and below target for culture testing in 9 of the 23 countries. Capacity for DST was below target in 17 of the 23 countries. EQA for smear microscopy laboratories was not available in one country and only partly established in 17 of the 23 countries. EQA for DST was only partly established in at least 5 of the 23 countries (**Table 8**).

4.2. Roll-out of rapid TB diagnostics

Two WHO-endorsed rapid tests for the diagnosis of TB and determination of drug-resistance, the GeneXpert MTB/RIF (Xpert MTB/RIF®, Cepheid, Sunnyvale, USA), and the Line Probe Assay (GenoType MTBDR*plus*®, Hain Lifescience, Nehren, Germany), continue to be rolled out globally and in the Americas. Instruments and test cartridges/kits for both tests are being offered at concessional prices via the Foundation of Innovative Diagnostics (FIND).[12]

In the Americas, 24 of the 39 countries have procured and used GeneXpert for the diagnosis of TB and the determination of drug-resistant TB at concessional prices, showing an increase from the previous year (**Box 8**). By the end of December 2014, a total of 1 085 GeneXpert modules and 448 100 cartridges had been procured at concessional prices by these countries.

[11] An initiative of the WHO / Stop TB Partnership; see: http://www.stoptb.org/wg/gli

[12] See: http://www.finddiagnostics.org

Table 8: Laboratory capacity for smear microscopy, TB culture, and DST, Americas region, 2014[a]

				Microscopy			Culture		DST		
		Top 10 inc. TB cases	Top 10 MDR-TB cases	Number of Laboratories	Laboratories per 100,000 population	Percentage laboratories with EQA	Number of Laboratories	Laboratories per 1 million population	Number of Laboratories	Laboratories per 5 million population	Percentage laboratories with EQA
North America	Canada										
	United States of America	☐									
Caribbean	Antigua and Barbuda										
	Aruba										
	Bahamas										
	Barbados										
	Cuba										
	Curacao										
	Dominica										
	Dominican Republic		☐	188	1.8	89%	13	1.2	2	1	100%
	Grenada										
	Haiti	☐	☐	221	2.1	79%	1	0.1	1	0.5	100%
	Jamaica			3	0.1	67%	0	0	0	0	0%
	Puerto Rico										
	Saint Kitts and Nevis										
	Saint Lucia										
	Saint Vincent and the Grenadines										
	Sint Maarten (Dutch part)										
	Trinidad and Tobago										
Mexico & Central America	Belize			8	2.3	0%	0	0	0	0	0%
	Costa Rica			102	2.1	100%	16	3	1	1.1	100%
	El Salvador			195	3.2	100%	25	4	1	0.8	100%
	Guatemala	☐	☐	289	1.8	98%	10	0.6	3	0.9	33%
	Honduras			184	2.3	79%	6	0.8	1	0.6	0%
	Mexico	☐	☐	1,299	1.0	53%	65	0.5	15	0.6	87%
	Nicaragua			220	3.7	94%	3	0.5	1	0.8	100%
	Panama			64	1.7	100%	10	2.6	1	1.3	100%
S. America (Andean)	Bolivia (Plurinational State of)	☐	☐	563	5.3	91%	62	5.9	2	0.9	50%
	Colombia	☐	☐	2,042	4.3	69%	1,052	22	5	0.5	100%
	Ecuador	☐	☐	319	2.0	100%	20	1.3	1	0.3	100%
	Peru	☐	☐	1,476	4.8	84%	50	2	7	1.1	100%
	Venezuela (Bolivarian Republic of)			257	0.8	46%	10	0	1	0.2	100%
South America (Other)	Argentina	☐	☐	705	1.6	44%	125	2.9	17	2.0	82%
	Brazil	☐	☐	3,382	1.6	47%	324	1.6	26	0.6	15%
	Chile			196	1.1	88%	39	2.2	1	0.3	100%
	Guyana			20	2.6	75%	1	1.3	0	0	0%
	Paraguay			133	2.0	86%	13	2.0	1	0.8	0%
	Suriname			3	0.6	67%	1	1.9	0	0	
	Uruguay			1	0	100%	1	0.3	1	1	100%

[a] Empty cells indicate that no data were made available; laboratory capacity below regional targets (listed in **Box 7**) are highlighted in red

Box 8

WHO monitoring of Xpert MTB/RIF roll-out: Orders of GeneXperts and Xpert MTB/RIF cartridges[a]

GeneXpert procured:	No GeneXpert yet:	Not eligible for preferential pricing:
Argentina	Antigua and Barbuda	Bahamas
Bolivia (Plurinational State of)	Belize	Barbados
Brazil	Dominica	Canada
Chile	Grenada	United States of America
Colombia	Saint Kitts and Nevis	
Costa Rica	Saint Lucia	
Cuba	Saint Vincent and the Grenadines	
Dominican Republic		
Ecuador		
El Salvador		
Guatemala		
Guyana		
Haiti		
Honduras		
Jamaica		
Mexico		
Nicaragua		
Panama		
Paraguay		
Peru		
Suriname		
Trinidad and Tobago		
Uruguay		
Venezuela (Bolivarian Republic of)		

[a]Data source: WHO / *FIND*; more information available at:http://www.who.int/tb/laboratory/mtbrifrollout/en/; Data through December 2014

Chapter 5

Management of Drug-resistant TB

In 2014, an estimated 7 000 people per year were expected to develop MDR-TB in the Americas (see **Chapter 1**). To cure them and to reduce the spread of DR-TB, appropriate case detection through DST for new and re-treatment patients and provision of effective treatment are essential. This chapter provides an overview of DST coverage, MDR-TB case detection, and treatment in the Americas.

5.1. Coverage of DST

The diagnosis of DR-TB requires that patients be tested for susceptibility to anti-TB drugs using either DST or rapid molecular diagnostics. The following figures for DST coverage refer to TB cases tested at any time during their treatment for rifampicin resistance – with or without isoniazid – using conventional or molecular diagnostics.

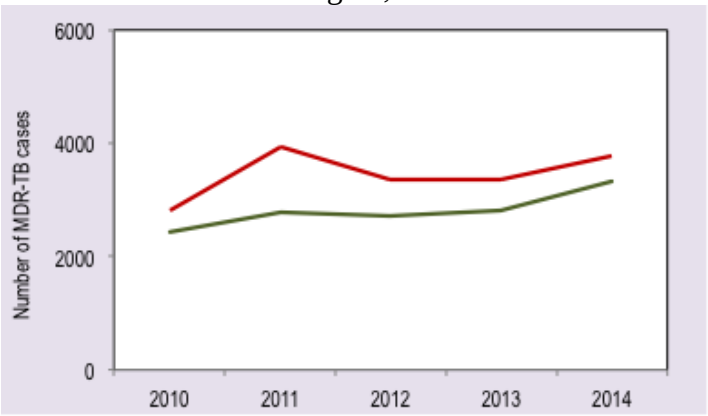
In 2014, about 30 700 new cases and 8 600 re-treatment cases had a DST result. Notification data combined with data from drug resistance surveillance suggest that in 2014 24% of laboratory-confirmed new PTB cases and 32% of re-treatment cases had a DST result. Data submitted by the NTPs suggest that the coverage varies substantially across countries and was low particularly in the South America-Other subregion (**Table 9**).

5.2. MDR-TB case detection and treatment

In 2014, a total of 3 083 MDR-TB cases and 662 RR-TB cases[13] were detected in the Americas. The total number of MDR-TB/RR-TB cases detected represented 55% of the estimated MDR-TB cases in the Americas (**Table 10**).

Treatment for MDR-TB was provided for 3 321 (88%) of RR/MDR-TB cases detected. **Figure 23** shows the total estimated numbers of MDR-TB cases compared to the number of MDR-TB cases diagnosed and treated in the Americas over time. Data at the subregional and country level emphasize the importance to strengthen MDR case detection and scale up MDR-TB treatment (**Table 9-10**), particularly in countries with high estimated numbers of MDR-TB cases (**Figure 24**).

Figure 23: Detected (red line) and treated (green line) MDR-TB cases, Americas region, 2009-2014



[13] Rifampicin-resistant TB is defined as TB that is resistant to rifampicin but not or unknowingly to isoniazid (as opposed to MDR-TB that is defined by resistance to both drugs). The WHO recommends that all patients with rifampicin-resistant strains should be treated using a full MDR-TB regimen. For surveillance purposes, the proportion of MDR-/RR-TB cases detected is compared to the number of patients for whom MDR-TB treatment was provided, and to the best estimate of MDR-TB cases that occurred among notified TB cases.

Table 9: DST coverage among TB and MDR-TB cases, Americas region, 2014

		New bacteriologically confirmed cases		Re-treatement cases		Unknown[1]	MDR-TB cases	
		with DST result[2]	% of total	with DST result[2]	% of total	with DST result[2]	with DST result[3]	% of total
Region								
	Americas	30,702	24	8,648	32	22,384	617	20
Subregions								
	North America	7,749	115	393	73	84	77	72
	Caribbean	703	5.4	343	19	145	44	24
	Mexico & Central America	1,510	7.1	1,623	59	302	13	5.1
	South America (Andean)	17,953	48	5,326	78	4,949	135	7.6
	South America (Other)	2,787	5.6	963	6.3	16,904	348	45
Countries								
North America	Canada	1,192	130	71	89	15	11	69
	United States of America	6,557	112	322	70	69	66	73
Caribbean	Antigua and Barbuda	0	0			0		
	Aruba	0	0			0		
	Bahamas	21	84	2	50	0		
	Barbados	0	0			0		
	Cuba	310	66	56	86	0	5	100
	Curaçao	4				0		
	Dominica					0		
	Dominican Republic	240	9	176	31	54	39	43
	Grenada					0		
	Haiti	0	0	91	7.9	91	0	0
	Jamaica	34	100	2	100	0		
	Puerto Rico	40	103			0		
	Saint Kitts and Nevis	0	0			0		
	Saint Lucia	6	120			0		
	Saint Vincent and the Grenadines	4	100	1	100	0		
	Sint Maarten (Dutch part)					0		
	Trinidad and Tobago	43	34	15	29	0		
Mexico & Central America	Belize	2	6.1	2	12	0		
	Costa Rica	0	0	1	5.3	0	0	0
	El Salvador	846	54	123	82	7	0	0
	Guatemala	353	17	28	13	0	0	0
	Honduras	117	6.5	93	42	8	0	0
	Mexico	42	0	1,282	73	0	13	7.8
	Nicaragua	0	0	55	27	0	0	0
	Panama	150	21	39	22	287	0	0
S. America (Andean)	Bolivia (Plurinational State of)	238	4.3	510	80	0	0	0
	Colombia	3,484	49	535	48	115	69	47
	Ecuador	1,016	28	720	160	0	51	20
	Peru	12,949	73	3,375	83	4,824	0	0
	Venezuela (Bolivarian Republic of)	266	7.5	186	34	10	15	100
South America (Other)	Argentina	894	17	546	41	1,500	91	98
	Brazil	0	0	0	0	15,344	240	36
	Chile	1,127	76	179	70	59	15	100
	Guyana	0	0	0	0	0		
	Paraguay	308	22	149	39	0	2	100
	Suriname	88	88	13	81	1		
	Uruguay	370	69	35	39	0	0	0

Blank cells indicate no cases in this category

[1] Unknown: DST results for TB cases with unknown previous TB treatment history

[2] DST is for rifampicin resistance only or for both rifampicin and isoniazid resistance

[3] DST is for a fluoroquinolone and a second-line injectable drug

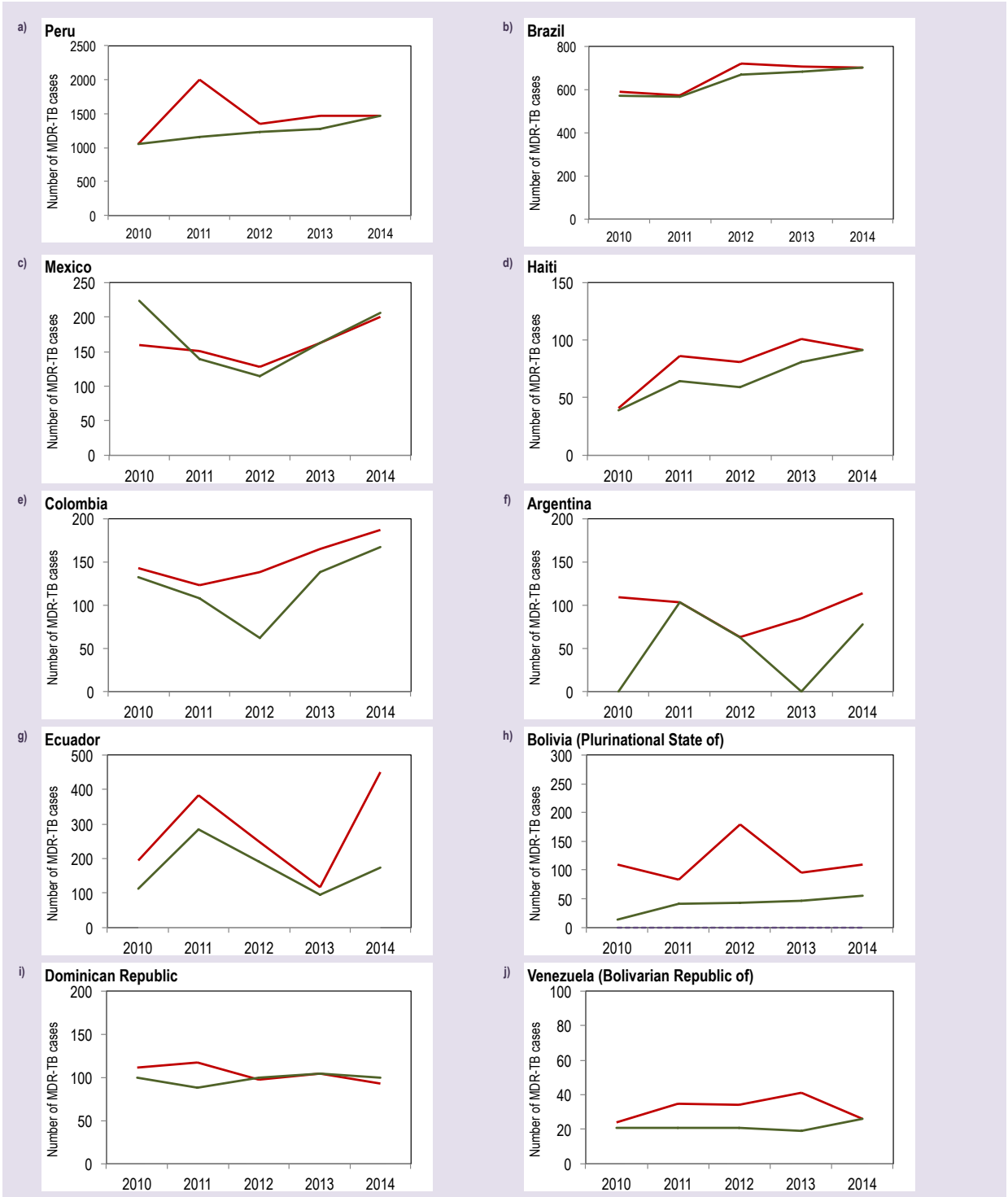
The percentage may exceed 100% if estimates of the number of MDR-TB cases are too conservative and if linkage between the clinical and laboratory registers is inadequate.

Table 10: MDR-TB cases estimated, diagnosed and treated, Americas region, 2014

		MDR-TB cases estimated [1]		MDR/RR-TB diagnosed		Enrolled on MDR-TB treatment	
		Best estimate	interval	Number	% of estimated	Number	% of diagnosed
Region							
	Americas	6,859	(5,413 - 8,234)	3,765	*55*	3,321	*88*
Subregions							
	North America	110	(88 - 140)	129	*117*	128	*99*
	Caribbean	621	(363 - 897)	194	*31*	204	*105*
	Mexico & Central America	820	(632 - 1,013)	340	*41*	300	*88*
	South America (Andean)	3,030	(2,640 - 3,420)	2,237	*74*	1,884	*84*
	South America (Other)	2,278	(1,690 - 2,764)	865	*38*	805	*93*
Countries							
North America	Canada	0	(0 - 0)	21		21	*100*
	United States of America	110	(88 - 140)	108	*98*	107	*99*
Caribbean	Antigua and Barbuda	0		0		0	
	Aruba	0		0		2	
	Bahamas	2	(0 - 5)	0	*0*	0	
	Barbados	0	(0 - 3)	0		0	
	Cuba	7	(0 - 14)	10	*143*	10	*100*
	Curaçao	0	(0 - 3)	0		0	
	Dominica	0		0		0	
	Dominican Republic	150	(95 - 210)	93	*62*	100	*108*
	Grenada	0		0		0	
	Haiti	450	(260 - 640)	91	*20*	91	*100*
	Jamaica	2		0		0	
	Puerto Rico	0	(0 - 4)	0		0	
	Saint Kitts and Nevis	0		0		0	
	Saint Lucia	0		0		0	
	Saint Vincent and the Grenadines	0		0		0	
	Sint Maarten (Dutch part)	0		0		0	
	Trinidad and Tobago	10	(8 - 12)	0	*0*	1	
Mexico & Central America	Belize	19	(18 - 19)	0	*0*	1	
	Costa Rica	7	(0 - 13)	1	*14*	1	*100*
	El Salvador	6	(0 - 16)	15	*250*	15	*100*
	Guatemala	130	(95 - 170)	62	*48*	34	*55*
	Honduras	63	(30 - 96)	12	*19*	12	*100*
	Mexico	500	(440 - 560)	201	*40*	206	*102*
	Nicaragua	50	(21 - 78)	18	*36*	20	*111*
	Panama	45	(28 - 61)	31	*69*	11	*35*
S. America (Andea	Bolivia (Plurinational State of)	210	(120 - 290)	110	*52*	55	*50*
	Colombia	360	(260 - 450)	187	*52*	167	*89*
	Ecuador	310	(250 - 380)	451	*145*	173	*38*
	Peru	2,000	(1900 - 2100)	1,463	*73*	1,463	*100*
	Venezuela (Bolivarian Republic of)	150	(110 - 200)	26	*17*	26	*100*
South America (Other)	Argentina	360	(240 - 480)	114	*32*	78	*68*
	Brazil	1,800	(1400 - 2100)	702	*39*	702	*100*
	Chile	23	(11 - 34)	23	*100*	10	*43*
	Guyana	28	(18 - 38)	4	*14*	0	*0*
	Paraguay	60	(18 - 100)	11	*18*	13	*118*
	Suriname	5	(3 - 6)	9	*180*	0	*0*
	Uruguay	2	(0 - 6)	2	*100*	2	*100*

[1] Notified cases of MDR/RR-TB in 2013 as a percentage of the best estimate of MDR-TB cases among all cases of pulmonary TB in the same year. The percentage may exceed 100% if estimates of the number of MDR-TB cases are too conservative and if linkage between the clinical and laboratory registers is inadequate.

Figure 24: MDR-TB cases Detected (red line) and treated (green line) MDR-TB cases in the ten countries with the highest burden of MDR-TB in the Americas, 2009-2014*

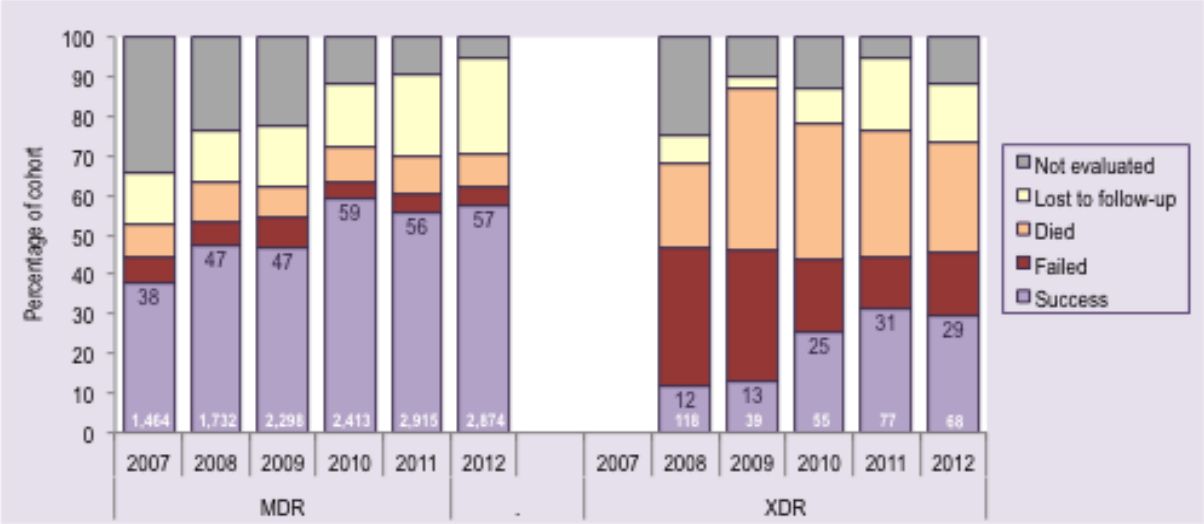


5.2. MDR-TB treatment outcomes

Of the 2 866 patients treated in the 2012 cohort of MDR-TB patients in the Americas, 1 642 (57%) were successfully treated, 131 (4.6%) failed treatment, 241 (8.4%) died, and 705 (25%) were lost to follow-up. Treatment success rates among MDR-TB and extensively drug-

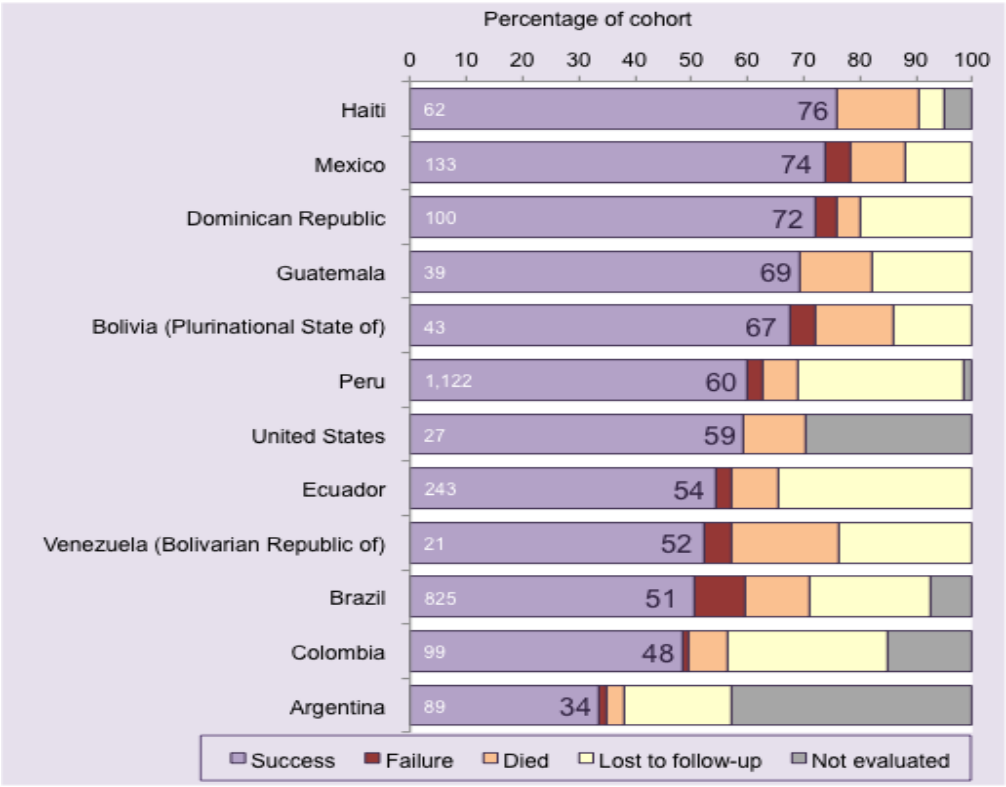
resistant TB (XDR-TB) patients have been increasing in the Americas in the past few years (**Figure 25**). Among the 12 countries with at least 20 MDR-TB patients treated, treatment success rates ranged between 34% and 76%. Several countries reported high rates of patients being lost to follow-up during MDR-TB treatment (**Figure 26**).

Figure 25: Treatment outcomes for MDR-TB and XDR-TB cases, by annual cohort, Americas region, 2007-2012 cohorts [a]



[a] White numbers at the base of the bars show cohort size

Figure 26: Treatment outcomes for MDR-TB cases, Americas region, 2012[a]



[a] Countries with a cohort size ≥20 MDR-TB patients only; white numbers show cohort size

Chapter 6

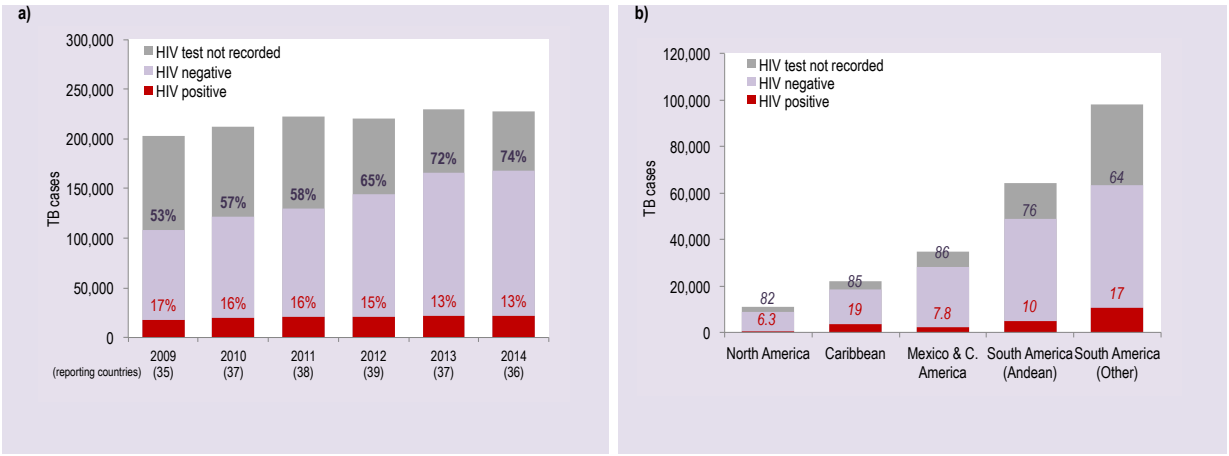
TB/HIV Collaborative Activities

By the end of 2013, 2.8-4.0 million people[14] were estimated to be living with HIV in the Americas. The WHO estimates that in the following year 36 000 people living with HIV developed TB. The Regional Plan for Tuberculosis Control[15] aims at strengthening collaborative activities of TB and HIV programs in the Americas. It is recommended that all TB patients get tested or know their HIV status. Co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) should be initiated or continued in HIV-positive TB patients. All people living with HIV should be screened for TB and those without active TB should receive isoniazid preventive therapy (IPT). To meet these recommendations, strengthening of collaboration between NTPs and HIV/AIDS programs is essential. This chapter provides an overview of HIV testing and provision of CPT and ART for HIV-positive TB patients and of intensified TB cases finding (TB screening) and isoniazid preventive therapy (IPT) among people living with HIV in the Americas.

6.1. Coverage of HIV testing among TB patients

WHO recommends that routine HIV testing be offered to all patients with presumptive and diagnosed TB as well as to partners of known HIV-positive TB patients.[16] In 2014, around 169 100 TB cases had an HIV test result recorded (or knew their status), 74% of all TB cases notified in the Americas (**Table 11**). The coverage of HIV test results among notified TB cases has been increasing in the past years (**Figure 27a**), most notably, in the countries with the highest estimated burden of TB/HIV (**Figure 27**). At the subregional level, it was lowest in South America-Other (64%) and highest in Mexico and Central America (86%) in 2014 (**Figure 27b**).

Figure 27 a-b: HIV test coverage and status among TB cases (a) region-wide (2009-2014) and (b) in five subregions[a]



[a] Bars show absolute numbers of TB cases; purple percentages indicate test coverage; red percentages indicate proportions HIV-positive

[14] Lower and upper estimates for people living with HIV (all sexes, all ages) were available for 29 of 35 countries in the Americas, representing 99.6% of the regional population in 2012. Data source: Joint United Nations Program on HIV/AIDS (UNAIDS); for more information, visit: http://www.unaids.org/

[15] Pan American Health Organization: Regional Plan for Tuberculosis control, 2006-2015. Washington, D.C, 2006. ISBN 92 75 12673 9.

[16] WHO policy on collaborative TB/HIV activities: guidelines for national programs and other stakeholders. Geneva, World Health Organization, 2012 (WHO/ HTM/TB/2012.1). Available at http://apps.who.int/iris/bitstream/10665/44789/1/9789241503006_eng.pdf

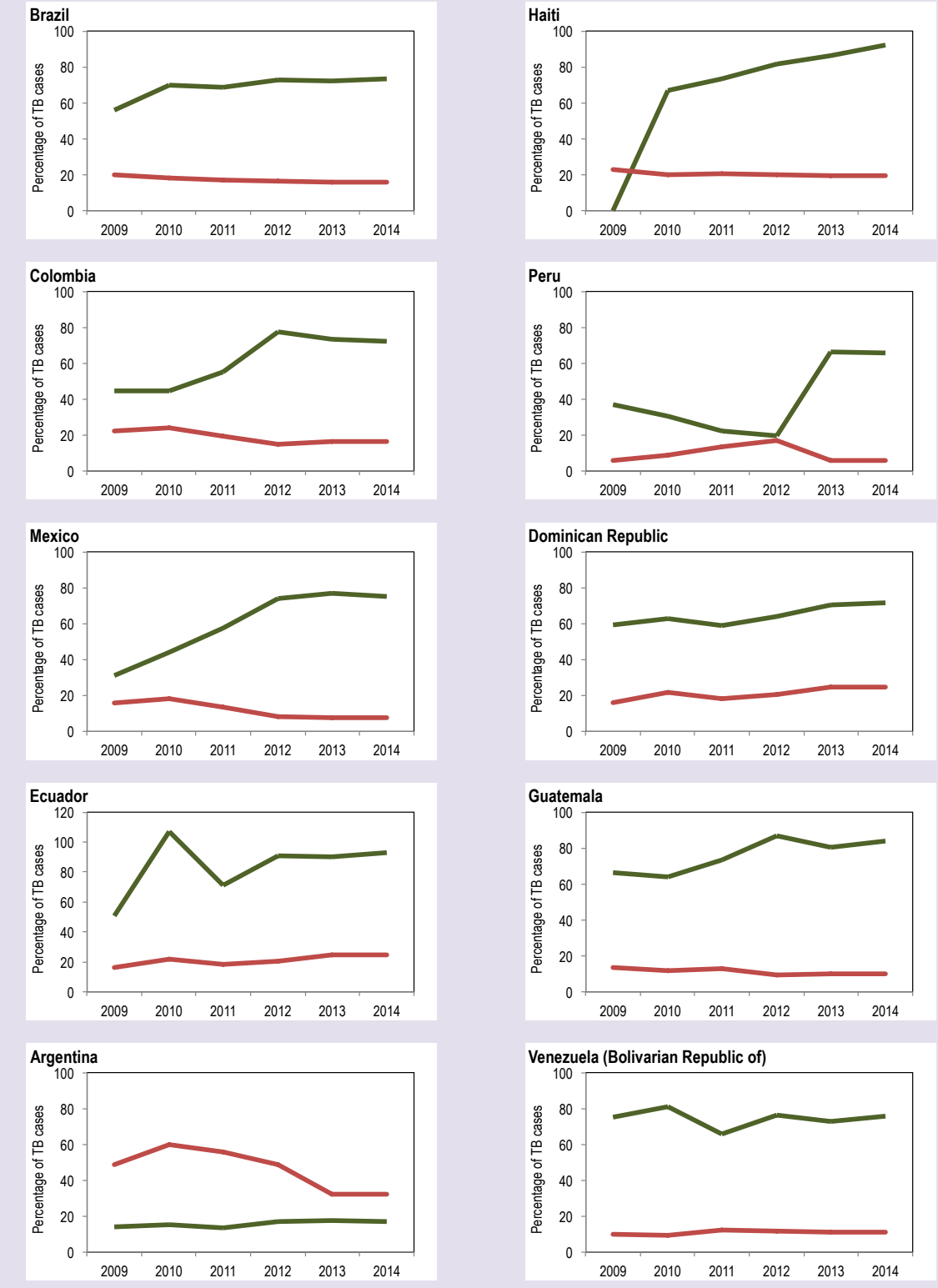
Table 11: HIV testing and provision of CPT and ART for HIV-positive TB cases, Americas region, 2014

			HIV testing		TB/HIV			
		Number of notified TB cases	Number of TB cases with an HIV test result recorded	% of notfied	Number of TB cases recorded as HIV- positive	% of tested	% of HIV-positive TB cases started/ continued on CPT	% of HIV-positive TB cases started on ART
Region								
	Americas	229,896	169,927	*74*	21,978	*13*	*52*	*64*
Subregions								
	North America	10,975	9,020	*82*	568	*6.3*		
	Caribbean	21,818	18,536	*85*	3,569	*19*	*59*	*64*
	Mexico & Central America	34,938	30,191	*86*	2,180	*7.8*	*72*	*74*
	South America (Andean)	64,064	48,956	*76*	4,909	*10*	*36*	*60*
	South America (Other)	98,101	63,224	*64*	10,752	*17*	*68*	*60*
Countries								
North America	Canada	1,568	803	*51*	64	*8.0*		
	United States of America	9,407	8,217	*87*	504	*6.1*		
Caribbean	Antigua and Barbuda	3	3	*100*	1	*33*	*100*	*100*
	Aruba	2						
	Bahamas	50	28	*56*	10	*36*	*0*	*0*
	Barbados	5	2	*40*	2	*100*	*0*	*0*
	Cuba	742	736	*99*	87	*12*	*0*	*0*
	Curaçao	5	5	*100*	1	*20*	*100*	*100*
	Dominica	1	0	*0*	0			
	Dominican Republic	4,605	3,377	*73*	782	*23*	*47*	*85*
	Grenada	0	0		0			
	Haiti	15,963	13,968	*88*	2,588	*19*	*63*	*54*
	Jamaica	86	79	*92*	19	*24*		*95*
	Puerto Rico	44	39	*89*	6	*15*	*33*	*33*
	Saint Kitts and Nevis	7	4	*57*	1	*25*	*100*	*100*
	Saint Lucia	6	6	*100*	1	*17*	*100*	*100*
	Saint Vincent and the Grenadines	6						
	Sint Maarten (Dutch part)	0	0		0			
	Trinidad and Tobago	293	289	*99*	71	*25*	*24*	*56*
Mexico & Central America	Belize	87	63	*72*	25	*40*	*100*	*100*
	Costa Rica	469	442	*94*	41	*9.3*	*100*	*100*
	El Salvador	2,220	2,173	*98*	203	*9.3*	*84*	*84*
	Guatemala	3,224	2,782	*86*	245	*8.8*	*93*	*93*
	Honduras	2,820	2,479	*88*	256	*10*	*79*	*82*
	Mexico	21,881	18,547	*85*	1,287	*6.9*	*70*	*59*
	Nicaragua	2,709	2,185	*81*				
	Panama	1,528	1,520	*99*	123	*8.1*	*0*	*95*
S. America (Andean)	Bolivia (Plurinational State of)	8,201	6,340	*77*	262	*4.1*	*48*	*68*
	Colombia	12,435	9,994	*80*	2,143	*21*	*42*	*38*
	Ecuador	5,352	4,729	*88*	637	*13*	*0*	*100*
	Peru	31,461	23,280	*74*	1,385	*5.9*	*42*	*66*
	Venezuela (Bolivarian Republic of)	6,615	4,613	*70*	482	*10*	*34*	*83*
South America (Other)	Argentina	10,038	1,580	*16*	447	*28*		
	Brazil	81,512	56,981	*70*	9,578	*17*		
	Chile	2,440	1,213	*50*	213	*18*		*31*
	Guyana	648	587	*91*	148	*25*	*91*	*70*
	Paraguay	2,417	1,900	*79*	190	*10*	*60*	*87*
	Suriname	158	154	*97*	44	*29*	*61*	*73*
	Uruguay	888	809	*91*	132	*16*	*55*	*52*

Blank cells indicate no data available.

* Data not sufficient to produce subregional/regional estimates.

Figure 28: Percentage cases with recorded HIV status of all notified TB cases (green line) and percentage HIV-positive of all TB cases with known status (red line), in the 10 countries with the highest number of estimated incident HIV-positive TB cases, Americas regions, 2009 – 2014



6.2. HIV co-infection among TB patients with HIV test results

In 2014, around 21 900 TB patients in the Americas were HIV-positive, 13% of all patients with a test result recorded (or with known HIV status). The percentage of HIV-positive TB patients was highest in the Caribbean and in South America-Other. It varied considerably across subregions and countries (**Figure 27b**, **Table 11**). At the regional level, the percentage HIV-positive has slightly declined over the past years (**Figure 27a**). A comparison of test coverage and percentage HIV-positive in the 10 countries with the highest estimated burden of TB/HIV in the Americas suggests that the proportion of HIV-positive test results has been declining along with an increase in test coverage in most countries (**Figure 28**). This may be due to a relative decrease in positive test results as countries move from testing of TB patients at clinical suspicion of HIV towards universal testing of patients. The inverse relationship between test coverage and HIV-positive test results has not been observed in the Dominican Republic where the percentage of test coverage rose from 59% to 71% and the percentage HIV-positive from 16% to 25% between 2009 and 2014 (**Figure 28**).

6.3. ART and CPT for HIV-positive TB patients

Both ART and CPT are important treatment interventions that can substantially reduce morbidity and mortality in TB patients living with HIV. The WHO recommends that ART and CPT be continued, or initiated as soon as possible, in all HIV-positive individuals diagnosed with TB.

Twenty-nine out of 39 countries reported data on the provision of ART and CPT for HIV-positive TB patients in 2014. At the regional level, a total of 7 200 HIV-positive TB patients were started or continued on ART (64%), and a total of 5 700 were started or continued on CPT (52%). The proportion of HIV-positive TB patients on ART varied across countries between 31% and 100% and that for CPT between 0% and 100% (**Table 11**).

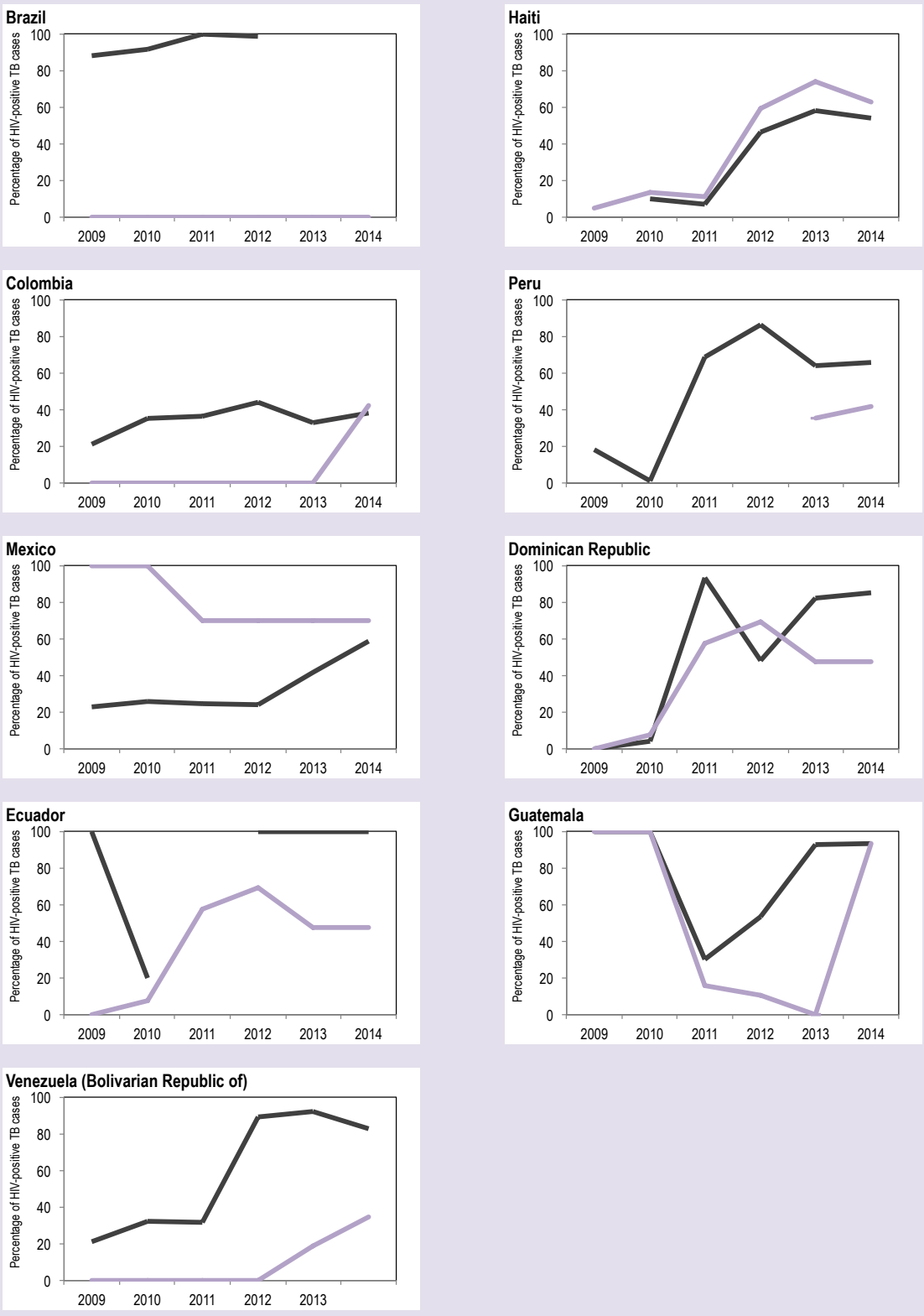
Although data reported between 2009 and 2014 suggest an increase in CPT and ART coverage in some of the countries with the highest estimated burden of TB/HIV (**Figure 29**), trends in most countries are currently unclear. Better reporting will be needed over the forthcoming years to monitor whether HIV-positive TB patients benefit from a scale-up in CPT and ART in the Americas.

6.4. Intensified TB case-finding and IPT among people living with HIV

WHO recommends systematic screening for TB ("intensified TB case finding") among people living with HIV, along with the provision of ART, IPT, and infection control.

In 2014, more countries than in previous years (22 of 39), provided data on TB screening and IPT among people living with HIV (**Table 12**). Figures from countries that provided data for multiple years suggest that there is an increase in the number of HIV-positive people screened for TB and on IPT in the Americas. Better reporting is needed to monitor trends for the scale-up of TB screening and IPT in the Americas in the forthcoming years.

Figure 29: Coverage of ART (black lines) and CPT (light purple lines) among HIV-positive patients notified, in nine of the top ten* countries by estimated incident of HIV-positive TB cases, Americas region, 2009 – 2014



*No data available for Argentina

Table 12: Screening for TB and provision of IPT to individuals living with HIV, Americas region, 2009 – 2014

		HIV-infected people screened for TB						HIV-infected people provided with IPT					
		2009	2010	2011	2012	2013	2014	2009	2010	2011	2012	2013	2014
North America	Canada												
	United States of America												
Caribbean	Antigua and Barbuda	1	0		125	125	46	0	0	5	1	5	1
	Aruba												
	Bahamas												
	Barbados		5				14	0				0	
	Cuba	1,249		1,608	1,506	1,603	1,337	1,561	1,366	1,429	1,339	1,438	1,300
	Curaçao												
	Dominica	12		2				2				0	
	Dominican Republic	0	5,041					822	5,041			171	945
	Grenada	1	23		8	19		0	0		0	1	
	Haiti		6,154		2,105	2,309			4,112		15,283	19,199	22,038
	Jamaica												
	Puerto Rico	4						0					
	Saint Kitts and Nevis												
	Saint Lucia	36			168		20	0			1		0
	Saint Vincent and the Grenadines			16	58			1				0	3
	Sint Maarten (Dutch part)												
	Trinidad and Tobago	335	648	715			3,656	4	11				
Mexico & Central America	Belize												
	Costa Rica	41									0		
	El Salvador	67	292			1,612	5,089	97	455			1,127	1,946
	Guatemala	525	24					250				316	
	Honduras	764	390			654	3,541	96	27		286	168	249
	Mexico	2,368						676					487
	Nicaragua	60	761	81	103	327	80	60	465	152	230	126	130
	Panama							196					
S. America (Andean)	Bolivia (Plurinational State of)												
	Colombia												
	Ecuador		390										287
	Peru							1,361	1,183		1,416	1,115	1,126
	Venezuela (Bolivarian Republic of)	30,158						102	102				
South America (Other)	Argentina												
	Brazil	8,668					37,540						
	Chile												
	Guyana	893	843			2,251	4,864	162	144	119	154	192	44
	Paraguay	273		231	412	381	669	0					0
	Suriname												
	Uruguay												

Empty cells indicate no data available.

Chapter 7

Childhood TB

Addressing the particular challenges of finding, diagnosing and treating TB in children is a priority of TB control globally and in the Americas. This chapter provides an overview about the estimated burden, case notification and treatment outcomes for childhood TB in the Americas.

7.1. The burden of childhood TB in the Americas

Producing estimates for the burden of childhood TB remains challenging. However, following a global consultation held in 2015 and based on collaborations between WHO and academic groups established since 2013 considerable progress has been made, and methods to estimate the incidence of disease among children have recently been updated. Global and regional estimates of TB incidence among children have been published by WHO using more robust methodology.

In 2014, an estimated 27 000 (uncertainty: 25 000 – 29 000) children (aged 0-14 years) developed TB in the Americas. Children represented 9.7% of the estimated regional burden of TB (all age groups) and 2.7% of the estimated global burden of childhood TB.

7.2. Childhood TB case notification and treatment outcomes

In the Americas, 10 250 new and relapse TB cases among children were notified in 2014, or 4.5 per 100 000 children. The number of notified childhood TB cases represented 38% (35% - 41%) of the estimated burden of childhood TB. **Table 13** and **Figure 30** provide an overview of notified TB cases among children in the region.

Children accounted for 4.9% of all notified TB cases in 2014. The proportion of childhood TB among all notified TB cases varied substantially across the countries (**Table 13** and **Figure 31**).

In most countries, the TB case notification rate for children in 2014 was similar or slightly slower compared to 2013, suggesting that there is currently insufficient progress towards reducing the gap in childhood TB case detection.

Few countries in the Americas provided sufficient data to monitor TB treatment outcomes among children. Reported treatment success rates in these countries varied between 46% and 98% (**Figure 32**).

In conclusion, there is a need to improve childhood TB case detection and reporting in the Americas over the forthcoming years and to improve monitoring of treatment outcomes among children.

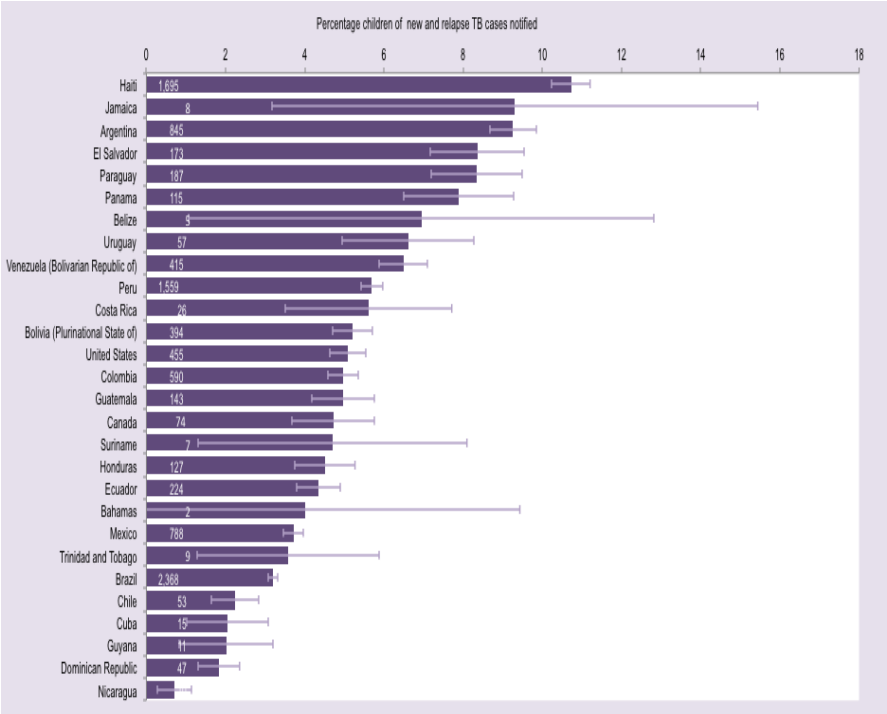
Table 13: TB case notifications among children, Americas region, 2014

		Population (0-14 years)	Notified cases of childhood TB			Notified TB cases 0-14 years per 100,000 children	Notified TB cases 0-14 years, percentage of all TB cases*
			0-4 years	5-14 years	Total 0-14 years		
Population (0-14 years)							
	Americas	230,234,448	*4,109*	6,141	10,250	*4.5*	*4.9*
Subregions							
	North America	66,585,715	*303*	226	529	*0.8*	*5.0*
	Caribbean	10,622,240	*846*	931	1,777	*16.7*	*9.1*
	Mexico & Central America	49,504,887	*461*	773	1,234	*2.5*	*3.8*
	South America (Andean)	37,392,678	*1,071*	2,111	3,182	*8.5*	*5.5*
	South America (Other)	66,128,928	*1,428*	2,100	3,528	*5.3*	*4.0*
Countries							
North America	Canada	5,707,179	*42*	32	74	*1.3*	*4.7*
	United States of America	60,878,536	*261*	194	455	*0.7*	*5.1*
Caribbean	Antigua and Barbuda	22,320	*0*	0	0	*0*	*0*
	Aruba	19,484					
	Bahamas	80,820	*1*	1	2	*2.5*	*4.0*
	Barbados	55,084	*0*	1	1	*1.8*	*20*
	Cuba	1,884,073	*5*	10	15	*0.8*	*2.1*
	Curaçao	30,000	*0*	0	0	*0*	
	Dominica	18,341	*0*	0	0	*0*	*0*
	Dominican Republic	3,148,325	*8*	39	47	*1.5*	*1.8*
	Grenada	28,264	*0*	0	0	*0.0*	
	Haiti	3,610,905	*823*	872	1,695	*46.9*	*11*
	Jamaica	672,232	*5*	3	8	*1.2*	*9.3*
	Puerto Rico	707,004	*0*	0	0	*0*	*0*
	Saint Kitts and Nevis	13,929	*0*	0	0	*0*	*0*
	Saint Lucia	43,233	*0*	0	0	*0*	*0*
	Saint Vincent and the Grenadines	27,170	*0*	0	0	*0*	*0*
	Sint Maarten (Dutch part)	9,558	*0*	0	0	*0*	
	Trinidad and Tobago	281,498	*4*	5	9	*3.2*	*3.6*
Mexico & Central America	Belize	116,391	*0*	5	5	*4.3*	*6.9*
	Costa Rica	1,079,896	*12*	14	26	*2.4*	*5.6*
	El Salvador	1,686,656	*46*	127	173	*10.3*	*8.4*
	Guatemala	5,945,105			284	*4.8*	*9.9*
	Honduras	2,589,881	*47*	80	127	*4.9*	*4.5*
	Mexico	35,188,628	*285*	503	788	*2.2*	*3.7*
	Nicaragua	1,835,685			29	*1.6*	*2.0*
	Panama	1,062,645	*71*	44	115	*10.8*	*7.9*
South America (Andean)	Bolivia (Plurinational State of)	3,473,928	*89*	305	394	*11.3*	*5.2*
	Colombia	11,805,193	*295*	295	590	*5.0*	*5.0*
	Ecuador	4,665,549	*64*	160	224	*4.8*	*4.3*
	Peru	8,727,371	*435*	1,124	1,559	*17.9*	*5.7*
	Venezuela (Bolivarian Republic of)	8,720,637	*188*	227	415	*4.8*	*6.5*
South America (Other)	Argentina	10,893,901	*293*	552	845	*7.8*	*9.3*
	Brazil	48,484,052	*990*	1,378	2,368	*4.9*	*3.2*
	Chile	3,635,019	*18*	35	53	*1.5*	*2.2*
	Guyana	227,700	*0*	11	11	*4.8*	*2.0*
	Paraguay	2,003,152	*93*	94	187	*9.3*	*8.3*
	Suriname	146,024	*4*	3	7	*4.8*	*4.7*
	Uruguay	739,080	*30*	27	57	*7.7*	*6.6*

Blank cells indicate no data available.

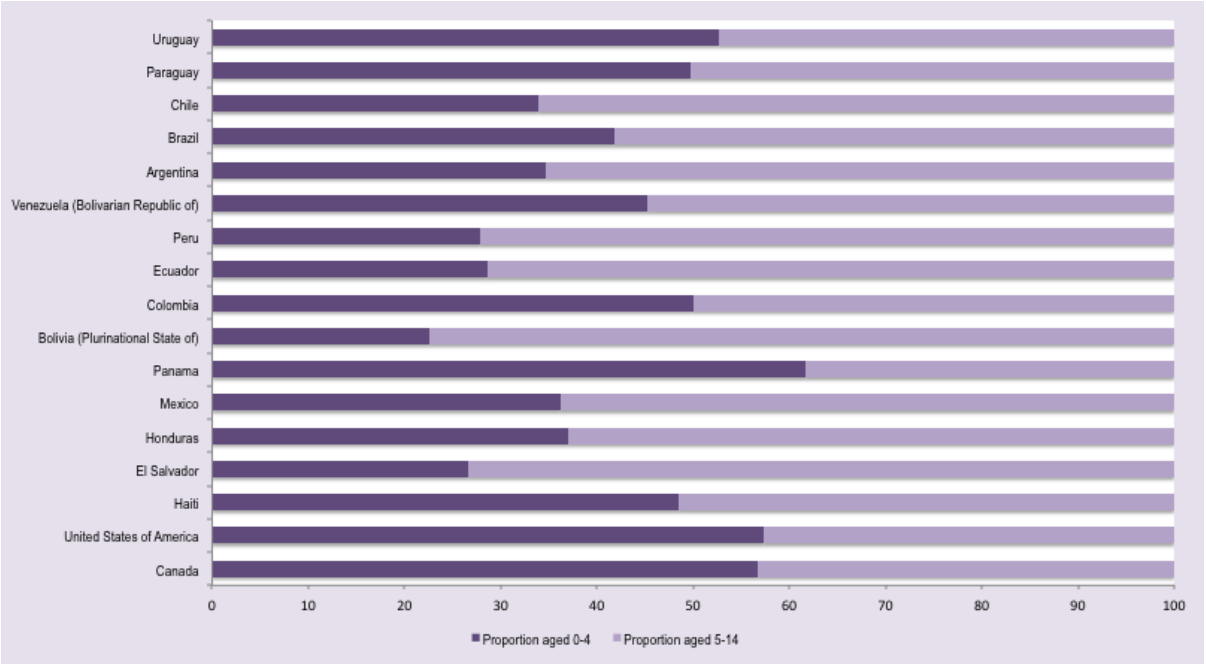
*The reference is the total number of tuberculosis cases included in the age-specific case report.

Figure 30: Proportion of childhood TB among all TB cases notified, Americas region, 2014[a]



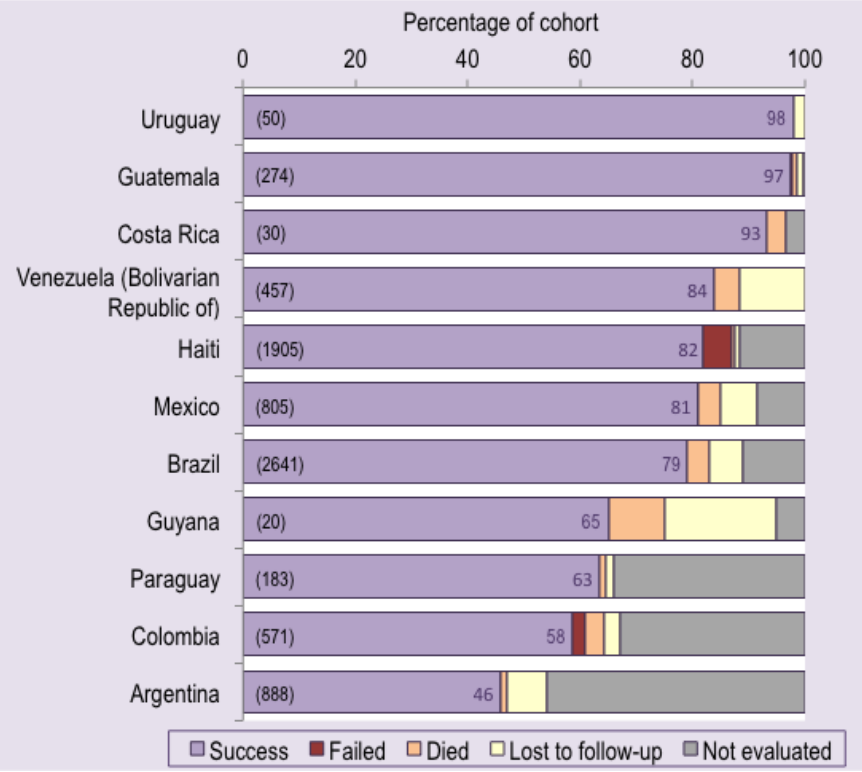
[a] Countries with at least 50 TB cases notified; white numbers show total number of children notified with TB; error bars show 95% confidence intervals

Figure 31: Proportion of TB cases aged 0-4 years and 5-14 years, Americas region, 2014[a]



[a] Countries with at least 50 TB cases notified

Figure 32: TB treatment outcomes for children in countries with available data, 2013 cohort[a]



[a] Countries with a cohort size (shown in brackets at the base) of at least 20 children treated for TB

Chapter 8

Financing TB Prevention, Diagnosis and Treatment

Progress in TB prevention, diagnosis and treatment requires adequate funding sustained over the years. Since 2002, WHO monitors funding for TB in all countries and findings have subsequently been published in global TB Reports. The global TB database[17] holds the financial data reported from 2002 up to 2015 for the 22 high-burden countries, and from 2006 for all other countries. It includes the NTP budget and the use of general health services up until 2015, and NTP expenditures until 2014. A comprehensive analysis of long-term trends in TB funding in low- and middle-income countries for the decade 2002–2011 was conducted by WHO in 2012. Results from these analyses were published in an article in the August 2013 issue of The Lancet Global Health.[18] Fifteen[19] countries of the region of the Americas were included in the analysis. Technical Appendix[20] explained the methods used for data validation each year at WHO as well as details on the estimation of inpatient/outpatient costs and the imputation model used for missing values. It is worth noting that validation and imputation methods improve every year and therefore it is likely that financial data shown for the years 2006-2014 in this year's Report do not match exactly with the data reported in previous Reports.

The aim of this chapter 8 is to present the funding trends during the period 2006-2015 for TB control in the region of the Americas for 16[21] selected countries, which together account for about 86% of the region's TB cases. Financial data for TB of Peru are included in the analysis of this year's Report. During 2015 the NTP of Peru collected the financial data from their system, matched the data to the WHO's data collection form and report it to WHO. Data for previous years were also collected; however, these need still to be revised and completed. Therefore, data for Peru for previous years are estimated values using the imputation model.

This chapter covers four main topics. It starts with an overview of the total funding received until 2014 in relation to the number of patients successfully treated until 2013 and the number of patients treated until 2014, which are the last years for which these data were reported by countries. This is followed by presentation and discussion of the cost per patient successfully treated. The third part of the chapter presents the available funding by intervention area, followed by the analysis of funding from domestic sources and international sources for the region since 2006 up to 2015. The final part analyses the funding gaps reported by the NTPs to WHO with breakdown by intervention area.

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

In the 16 low-income and middle-income countries included in the analyses, that together account for 86% of the total TB cases notified of the region, total funding received for treatment of drug-susceptible tuberculosis grew from US$ 140 million in 2006 to US$ 330

[17] www.who.int/tb/data

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

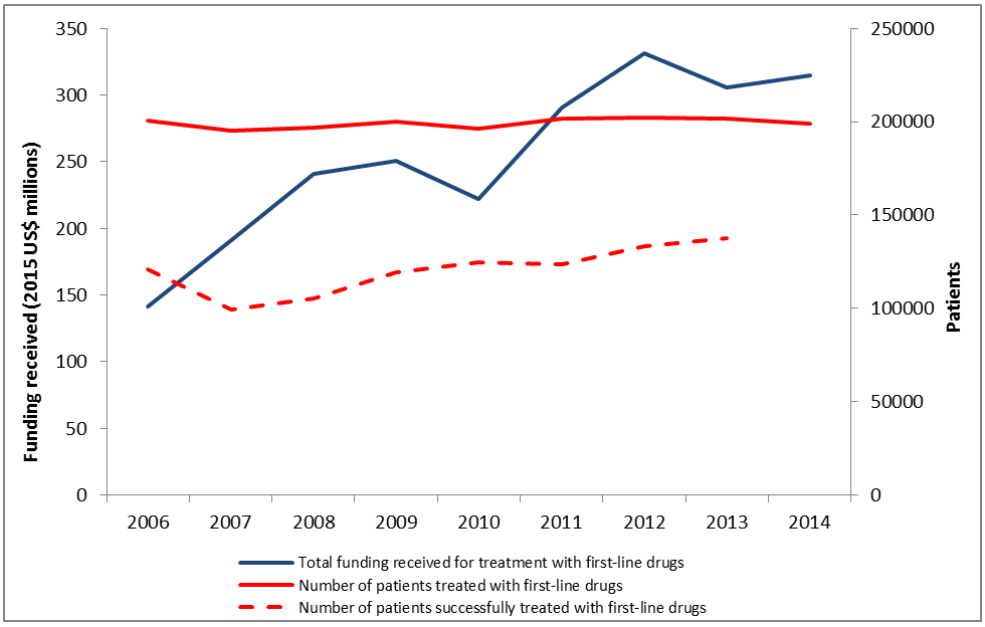
[19] The 15 countries were: Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama and Paraguay.

[20] It can be accessed at http://download.thelancet.com/mmcs/journals/langlo/PIIS2214109X13700329/mmc1.pdf?id=caaTtVN18ZdQw9Q0Wz-qu

[21] The 16 countries included are: Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay and Peru.

million in 2014 (Figure 8.1) [22]. The increases in funding received (from 2006 to 2014) ranged from a small 4% in Bolivia, to 72% in Mexico, and to more than 3 times the 2006 value in Nicaragua. Increases in funding were also accompanied by increases in the number of patients successfully treated, from 120,000 in 2006 to 137,000 in 2013; around 1.8 million people were treated between 2006 and 2014 in these 16 countries.

Figure 33: Total funding received for treatment of drug-susceptible TB and number of patients treated with first-line drugs, 16 selected countries, 2006-2014. *Funding received includes that for drug and non-drug costs channelled through the NTPs and for hospital care and outpatient visits.*



Cost per patient successfully treated was US$ 595 for a low-income country like Haiti and between US$ 977 (Bolivia) – US$ 6008 (Dominican Republic) for the other countries in the analysis – which are middle income countries (**Figure 8.2**). In general, countries in the analysis show an increase in the cost per patient successfully treated, therefore the group of countries is moving towards the solid line (values on the solid line mean that the cost per patient is equal to the Gross Domestic Product per capita[23] – GDP pc). Globally low-income countries spent on average US$ 516, so Haiti is around the world average. Dominican Republic spends per patient treated around the world average for upper-middle income countries.

Three countries – Nicaragua, Jamaica and Dominican Republic, show an average cost per patient successfully treated slightly higher than their GDP pc (the value is above the solid black-line in **Figure 8.2**), this indicates that treatment of tuberculosis in these countries does not seem to be cost-effective[24]. In all of the other countries in the region, the cost per patient

[22] Funding received is the amount of money received by the NTP in one year from the different sources. This amount is reported by the country to WHO once the year has ended. For example, the funding received during 2013 was reported to WHO during the year 2014.

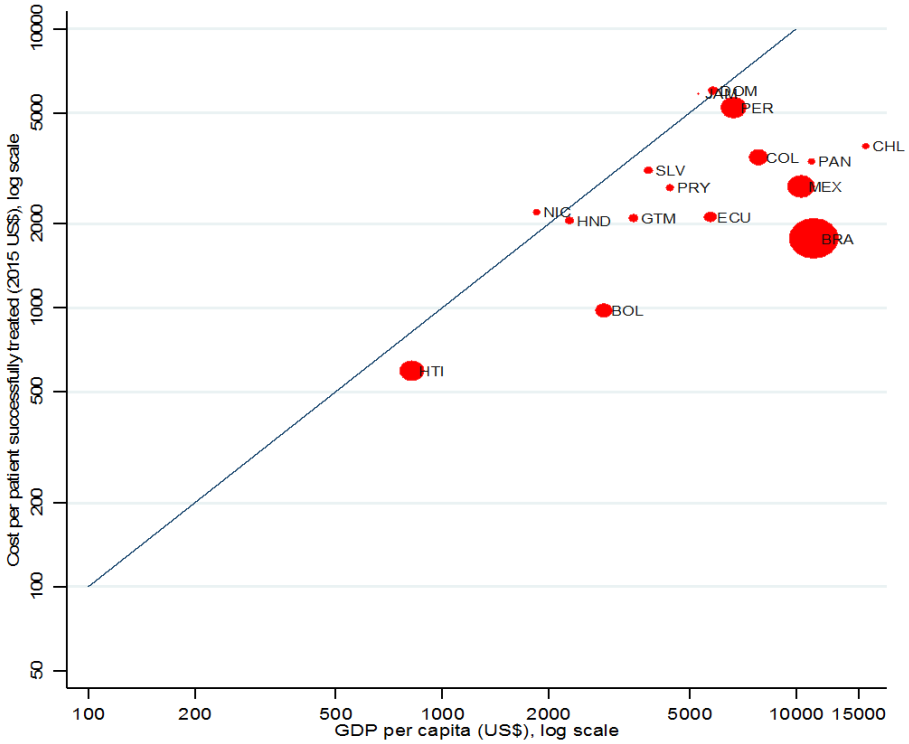
[23] http://data.worldbank.org/indicator/NY.GNP.PCAP.CD.

[24] http://www.who.int/choice/costs/CER_thresholds/en/ . GDP pc is used as the indicator to derive threshold values for cost-effectiveness of health interventions; if the cost per patient is less than GDP pc then probably the intervention is cost-effective. Our analysis does not intend to calculate cost-

treated is less than GDP pc (all values lie below the solid black line in **Figure 8.2**); this means that treatment for tuberculosis seems to be cost-effective in each country.

Although the cost per patient successfully treated tends to be higher in the higher-income countries, a further explanation for variation in costs appears to be the number of patients treated. Some of the countries that show relatively low costs for treating patients in regards to 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 8.2**). Brazil has the third highest income level of the group of countries analysed, after Chile and Mexico, but it also treated the largest number of patients in the region. Therefore its average cost per patient is similar/lower to the cost of low-middle income countries, for example in comparison with Bolivia. Average cost per patient successfully treated is increasing in Nicaragua because the number of patients successfully treated is decreasing in the last three years whereas the costs are about the same.

Figure 34: Cost per TB patient successfully treated with first-line drugs, 16 selected countries, 2013



The three-digit letters for each country mean the following: BOL: Bolivia. BRA: Brazil. COL: Colombia. DOM: Dominican Republic. ECU: Ecuador. GTM: Guatemala. HND: Honduras. HTI: Haiti. JAM: Jamaica. MEX: Mexico. NIC: Nicaragua. PAN: Panama. PER: Peru. PRY: Paraguay. SLV: El Salvador.

Notes

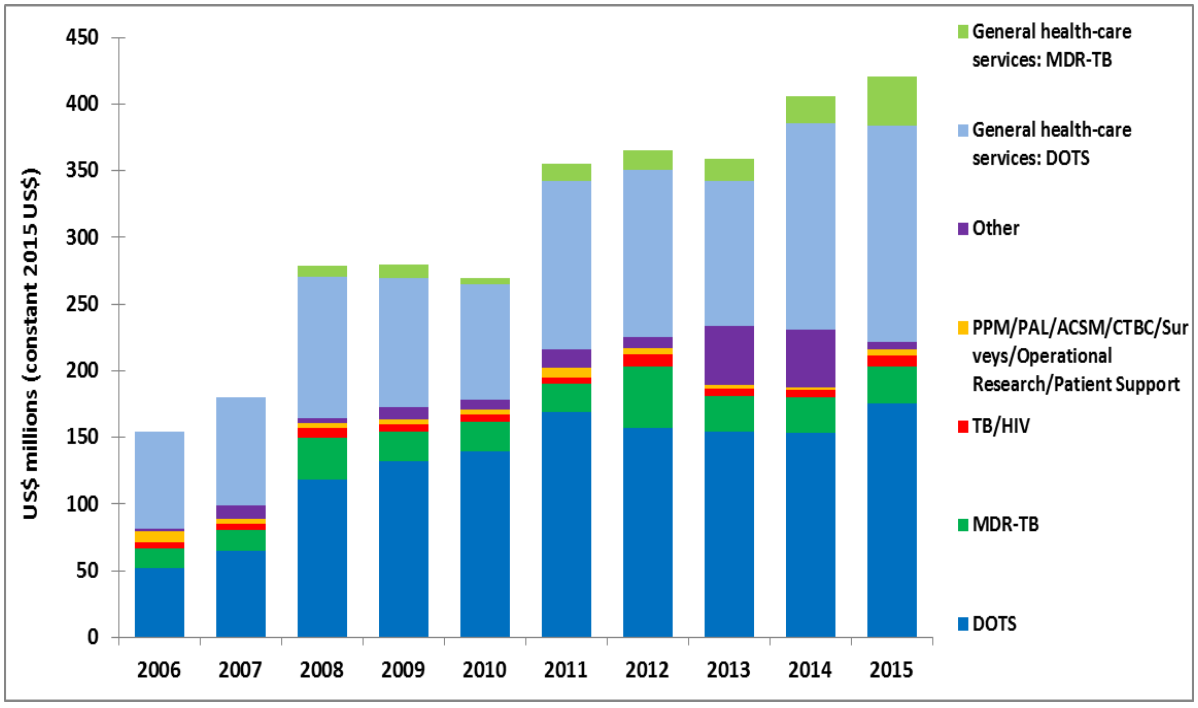
1. The black line marks where cost per patient treated equals GDP per capita. The area of the circle is proportional to the caseload.
2. Costs include first-line drugs, NTP staff, program management and supervision, laboratory equipment and supplies, collaborative TB/HIV activities public-private mix (PPM); the Practical Approach to Lung Health (PAL); advocacy, communication and social mobilization (ACSM); community-based care (CTBC), operational research, surveys, hospital stays and clinic visits.
3. Costs per patient successfully treated are case-weighted three-year mean, 2011–2013, to minimize distortions associated with non-annual expenses on items such as buildings, equipment and buffer stocks of drugs.
4. The legend for Jamaica (JAM) and Dominican republic (DOM) are superposed. The tiny circle corresponds to Jamaica, the slightly more bigger circle is for Dominican Republic.

effectiveness ratios for tuberculosis treatment in these countries; but as a proxy we compare the cost per patient successfully treated (calculated as the funds received divided by the number of patients successfully treated, as reported by countries) with the GDP pc.

8.2 Total funding available for TB, by category of expenditure and sources of funding, 2006-2015

In the 16 countries, funding available[25] for TB reached US$ 420 million in 2015, around three times more than the US$ 153 million that was available in 2006 (**Figure 8.3**). Most funding since 2006 has been used for diagnosis and treatment of drug-susceptible TB (DS-TB). In **Figure 8.3** it would be the categories DOTS (which assembles first-line drugs; NTP staff; program management and supervision; and laboratory equipment and supplies), in addition to public-private mix (PPM); the Practical Approach to Lung Health (PAL); advocacy, communication and social mobilization (ACSM); community-based care (CTBC); operational research; sporadic surveys and patient support) and the use of general health services for DOTS. The category DOTS is not exclusive for drug-susceptible TB patients since it also constitutes the basis for diagnosing, treating and managing patients with RR/MDR/XDR-TB and co-infected TB/HIV. A detailed breakdown of the funding estimated to be required for drug-susceptible TB, MDR-TB and collaborative TB/HIV activities in 2015, based on NTPs assessments of their needs, is shown for the 16 priority countries in **Table 8.1**.The funds for the category "Other" in 2013 and 2014 (**Figure 8.3)** are large compared with other years; this is largely due to wrong categorization of interventions in the reporting in those years from one country.

Figure 35: Funding available for TB prevention, diagnosis and treatment by intervention area, 16 selected countries, 2006-2015



[25] Funding available for TB prevention, diagnosis and treatment, refers to the amount of money that the NTP believes is going to receive in one year. The funding available in 2014 was reported by the country to WHO in 2014.

Table 14: NTP budget for drug-susceptible (DS-TB), drug-resistant (DR-TB) TB patients and collaborative TB/HIV activities, 16 selected countries, 2015, current US$ millions

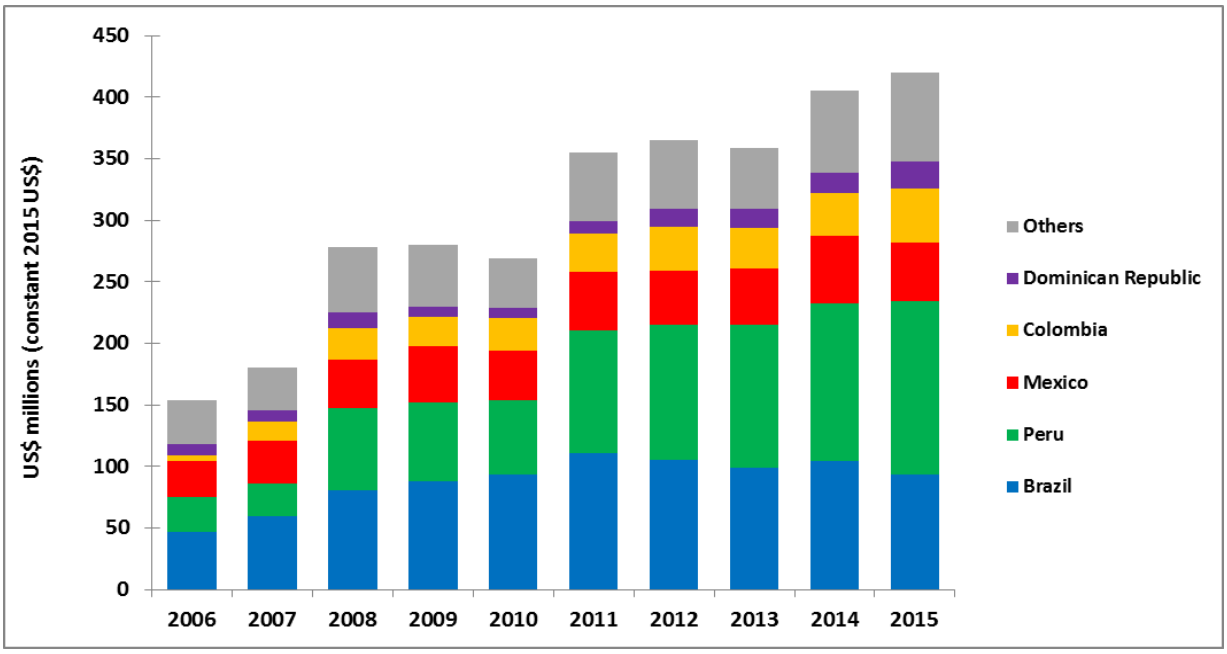
	NTP Budget			
	Total	**DS-TB**	**DR-TB**	**TB/HIV**
Peru	84.5	66.7	13.6	4.3
Brazil	76.8	65.1	9.4	2.3
Paraguay	22.8	21.3	0.1	1.4
Dominican Republic	21.5	19.2	1.8	0.5
Mexico	16.8	16.1	0.6	0.0
Honduras	13.3	12.3	0.5	0.5
Colombia	11.6	9.7	1.4	0.5
Guatemala	10.7	8.6	1.7	0.4
Haiti	8.6	7.0	1.2	0.3
El Salvador	5.1	3.7	0.3	1.1
Nicaragua	4.3	4.1	0.2	0
Ecuador	4.2	3.1	1.1	0
Chile	2.2	2.2	0	0
Bolivia	1.5	1.1	0.4	0
Jamaica	0.2	0.1	0	0.1
Panama	–	–	–	–
Total	**284**	**240**	**32**	**11**

– Data not available.

The general health care services are used by TB and MDR-TB patients when hospitalized (inpatient) or when visiting the health care center for DOT and follow-up visits (outpatient). The use of general health services has represented around 50% of the total funds used for diagnosis and treatment of DS-TB. Inpatient care accounts for the majority of the costs in general health care services. The percentage of TB patients hospitalized is as low as 1-10% (Chile, Dominican Republic, Ecuador, El Salvador, Haiti, Honduras, Mexico, Nicaragua, Paraguay), but also as high as 18-40% in Brazil, Colombia, Panama, Peru and reaches 100% in Jamaica. The cost of use of general health services increased from 2013 to 2014 because of the increase in the number of patients expected to be treated reported from mainly Brazil.

Since 2006 funds available to prevent, diagnose and treat MDR-TB patients have increased considerably. In 2006 around US$ 15 million were available, and have reached US$ 65 million in 2015. The number of patients treated for MDR-TB has increased from around 1900 in 2006, to 3336 in 2015. In 2015 the funds required for the use of general health services by MDR-TB patients increased due to the rise in the percentage of MDR-TB patients reported to be hospitalized in Peru.

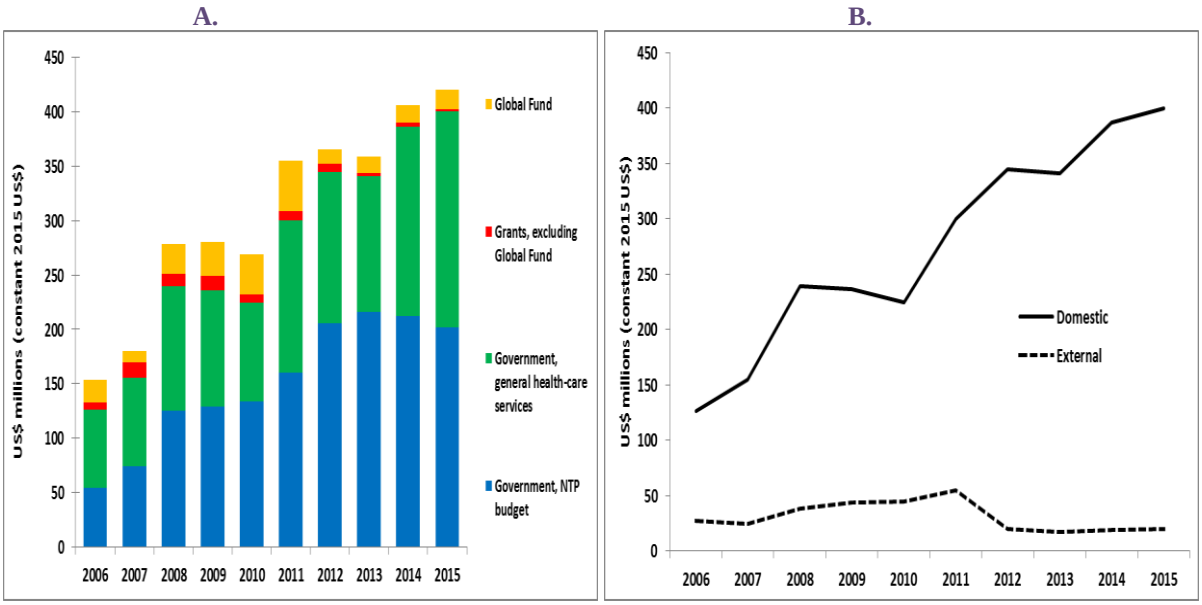
Figure 36: Available funding for TB prevention, diagnosis and treatment by country, 16 selected countries, 2006-2015



Brazil, Peru, Mexico, Colombia and Dominican Republic are the 5 countries with the largest funding available for TB (**Figure 8.4**). Among the group of 16 countries, only Brazil, Peru and Mexico account for 67% of total funding available in 2015 and for 68% of the notified cases in 2014. Total available funding for TB has been in general stable for the last 5 years, at around US$ 350-400 million, reaching US$ 420 million in 2015. Funding available for TB is slightly increasing in Peru but it is decreasing in Brazil.

Domestic funding for TB can be channelled in two ways: 1) via the NTPs i.e. funds specifically for TB prevention, diagnosis and treatment from the governments (including loans taken by the government); and 2) through the use of general health services, this would be funds from domestic sources for inpatient and outpatient care for tuberculosis patients. In 2015, domestic funding for the TB-specific budgets of NTPs accounts for the largest single share of funding (**Figure 8.5a).** External funding is compiled in two groups, 1) those funds from the Global Fund to fight AIDS, Tuberculosis and Malaria (The Global Fund); and 2) those funds from other grants, such as funds received directly from DFID, WHO, USAID or the Italian Cooperation (among others).

Figure 37: Domestic and external funding available for TB care and control, 16 selected countries, 2006-2015. **A.** Break-down by categories. **B.** Overall trends in domestic and external funding.



In the region of the Americas, domestic funding rose from US$ 127 million in 2006 to US$ 400 million in 2015 (**Figure 8.5.b**); as a share of total funding for TB, domestic funding increased from 82% in 2006 to 95% in 2015. Domestic funding channelled through the NTP rose from 43% (2006) to 55% (2015) of total government funding. Most of the increase in domestic funding, channeled through the NTP, was accounted for by Brazil, Peru and Mexico. In 2015, NTPs reported budgets in the range of US$ 0.2 million (Jamaica) to US$ 85 million (Peru) (**Table 8.2**).

External funding had its maximum contribution in 2011 with about US$ 55 million, since then, total donor funding remained stable at around US$ 20 million per year (2012-2015). The Global Fund is the principal external source of funding for the region, its contribution reached a maximum of US$ 46 million in 2011; since 2012 it has been around US$ 15 million per year (2012-2015); in 2015 it represents 88% of total donor.

Table 15: Reported NTP budget, available funding from domestic and international donor sources, funding gap and share of NTP budget provided by domestic and international donor funding, 16 selected countries, 2015, US$ millions.(a)

	Total NTP budget	Domestic funding	International donor funding	Share of available NTP funding (b+c) provided from domestic sources (%)	Share of available NTP funding (b+c) provided by international donors (%)	Funding gap
Peru	84.5	81.4	1.5	96.3%	1.8%	1.6
Brazil	76.8	55.2	0.6	71.9%	0.8%	20.9
Paraguay	22.8	3.8	0.6	16.7%	2.6%	18.4
Dominican Republic	21.5	13.8	3.0	64.2%	14.0%	4.7
Mexico	16.8	16.8	0	100%	0%	0
Honduras	13.3	2.3	1.7	17.3%	12.8%	9.4
Colombia	11.6	7.0	1.7	60.3%	14.7%	2.8
Guatemala	10.7	9.4	0.6	87.9%	5.6%	0.7
Haiti	8.6	0.3	6.2	3.5%	72.1%	2.1
El Salvador	5.1	4.8	0.3	94.1%	5.9%	0
Nicaragua	4.3	0.0	2.3	0%	53.5%	1.9
Ecuador	4.2	3.5	0.7	83.3%	16.7%	0
Chile	2.2	0.3	0	13.6%	0.0%	1.9
Bolivia (Plurinational	1.5	0.8	0.8	53.3%	53.3%	0
Jamaica	0.2	0.2	0	100%	0%	0
Panama	–	–	–			–
TOTAL	**284**	**200**	**20**	**70%**	**7.0%**	**64**

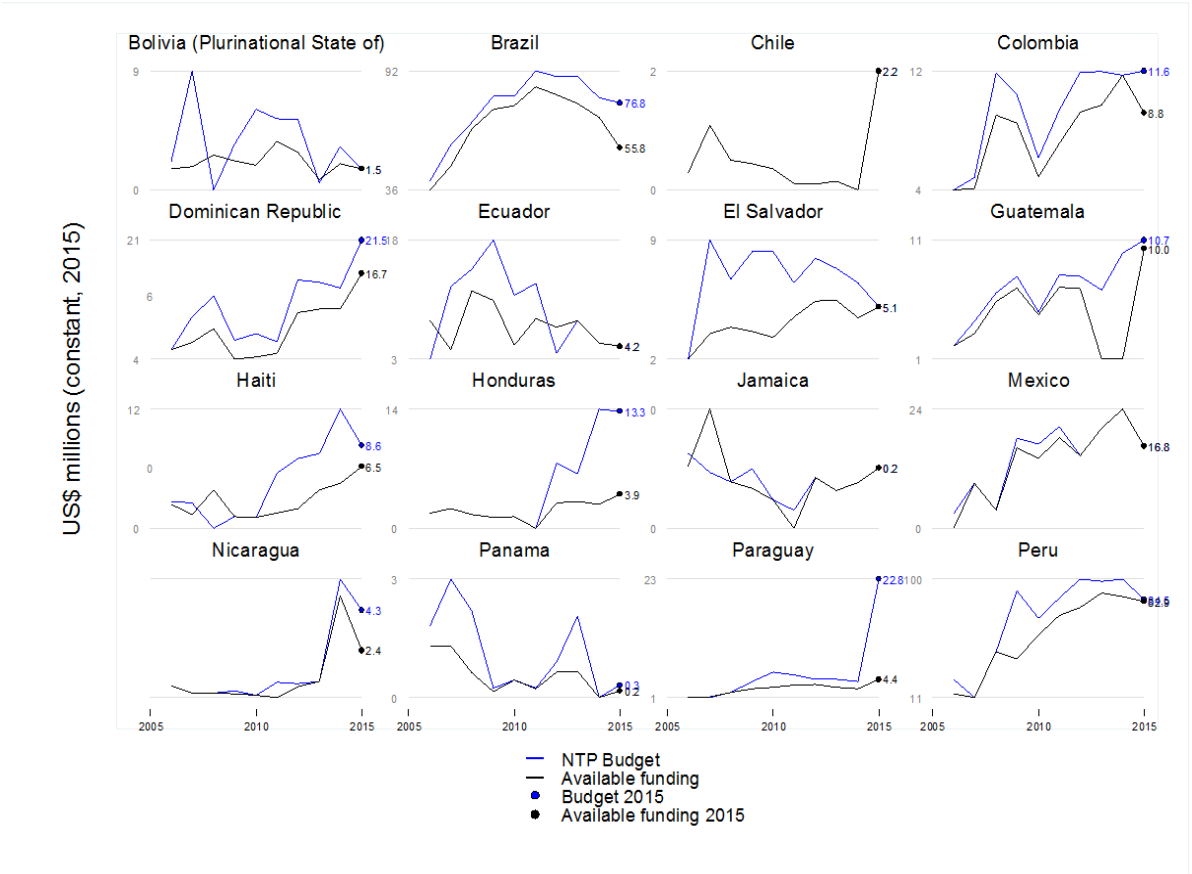
– Data not available.

(a) Data can differ from those presented in other figures as they have not been adjusted to constant 2015 US$.

8.3 Funding gaps for TB prevention, diagnosis and treatment, 2008-2015

Trends in the total needs and resources mobilized by the NTPs in these 16 countries as a whole conceal important variations among them (**Figure 8.6**). Steadily growing regional trends for funding for the period 2006-2015 (**Figure 8.5**) are dominated mainly by the trends in Brazil and Peru, and to a lesser extent by those in Mexico; most of the countries do not show a continuous growing trend for funding but rather sporadic highs and lows (**Figure 8.6**). The funding estimated to be required in Brazil (equivalent to the NTP budget) shows a decreasing trend since 2013 with increasing funding gaps. Countries with small populations like Dominican Republic, Guatemala and Honduras show increasing trends in their NTP budgets and available funding.

Figure 38: NTPs budget and funding available, 16 selected countries, 2006-2015



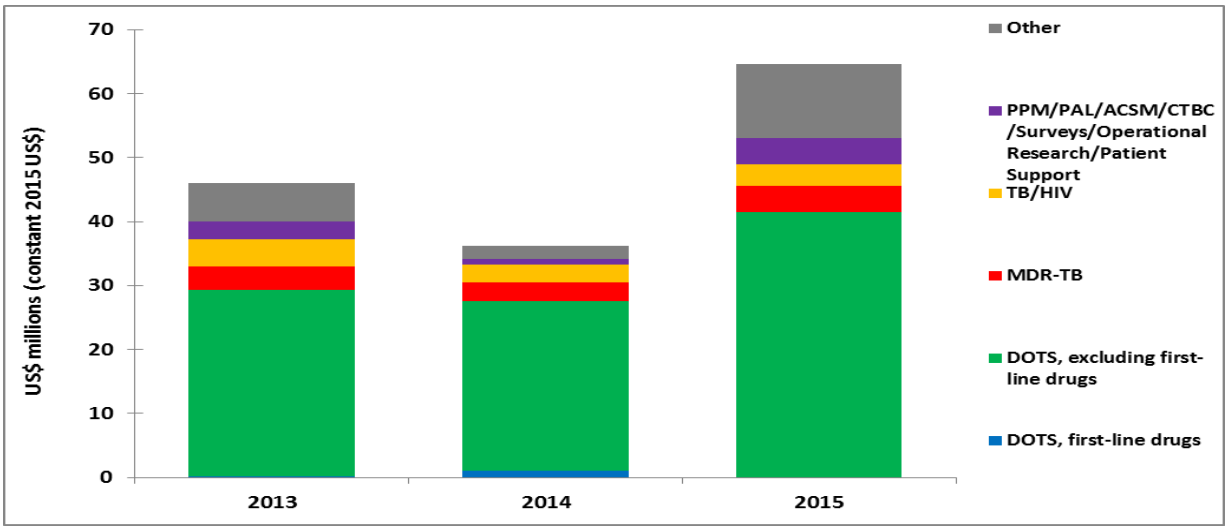
Despite the growth in resources available for TB, countries still report funding gaps which in 2015 amounted to US$ 64 million. This is a considerable increase in reported funding gaps compared with the previous two years, where gaps were US$ 46 and 36 million respectively. Funding gaps are defined as the difference between assessments of funding needs for TB prevention, diagnosis and treatment by NTPs and the actual amount of funds mobilized. Funding gaps have persisted and increased over time. A plausible reason may be that countries are developing more ambitious plans for scaling up interventions, investments in new diagnostic technologies and new policies resulting in increased funding needs. Many NTPs continue to be unable to mobilize all the funding that they estimate necessary to fully implement their national strategic plans. Brazil, Paraguay and Honduras are the three countries with the largest funding gaps for 2015, adding up to US$ 50 million (**Table 8.2**).

Gaps were reported in all income levels (**Table 8.3**) and for all the different interventions of TB prevention, diagnosis and treatment (**Figure 8.7**). DOTS –excluding first-line drugs (composed of NTP staff, program management and laboratory supplies/equipment) is the component showing the largest funding gap in the region. Upper-middle income countries account for the largest reported funding gaps about US$ 39 million in 2015; US$ 21 million within this group were reported by Brazil and US$ 18 million by Paraguay (**Table 8.3**). The NTP of Brazil reports that the funding gap is mainly for the routine program management activities (US$ 12 million) and laboratory infrastructure/equipment/supplies (US$ 4.3 million). The funding gap reported in the group of lower-middle income is dominated by Honduras, most of it relates to routine program management activities (US$ 3.5 million gap) and NTP staff (US$ 2.6 million gap).

Table 16: Total funding gaps according to income level groups in 2015

Group of income level	Funding gap (US$ millions), 2015	*Funding gap as a proportion of total needs for TB*
Low income	2	*24%*
Lower middle income	12	*34%*
Upper middle income	48	*20%*
High income	2	*86%*
Total	64	

Figure 39: Funding gaps by category of expenditure, 16 selected countries, 2013-2015



8.3.1 Active Global Fund grants for TB in the region

The Global Fund is the most important donor for TB prevention, diagnosis and treatment in the Americas. Up to the end of 2015, the Global Fund had disbursed US$ 100 million to 15 countries for 20 grants in progress in the region (**Table 8.4** – these 15 countries are not necessarily the same as the countries in the analysis of the chapter). The countries that were most lagging behind (until the end of 2015) in the implementation of their grants were Honduras, Ecuador, Peru and Guyana (columns 8 and 9 of **Table 8.4**). These countries are at the end of the period of their grants, but the funds still to be disbursed are quite high. For example, Ecuador (grant 1) has 0% of time left of the grant, but still 41% of funds had not been disbursed. Despite this, the grant's ratings in the region were good (column 2 of **Table 8.4**), of the 20 active grants, 9 are rated with A1 or A2, only one grant in Ecuador is rated as B2 (meaning inadequate performance but potential demonstrated).

Table 17: Active Global Fund grants and country performance in the Region of the Americas, as of end 2015 (*Cut-off-date: 1 February 2016)*

General Information		Key grant data		Finance data - Looking backwards		Finance data - Looking forward		
Country	**Latest Rating**	**Signed Amount (Cumulative to date) [1]**	**Disbursed Amount (Cumulative to date) [2]**	**Funds that could theoretically have been disbursed at cut-off date 4 (= time elapsed x signed amount)**	**Difference between Funds that could theoretically have been disbursed at cut-off date and Disbursed**	**Funds remaining (=Signed - Disbursed amount)**	**Proportion of funds remaining of signed amount (%)**	**Time left until end of grant (%)**
Honduras	B1	$ 9,100,813	$ 6,369,490	$ 8,347,049	$ 1,977,559	$ 2,731,323	30%	8%
Ecuador - grant 1	B2	$ 3,304,845	$ 1,941,884	$ 3,304,845	$ 1,362,961	$ 1,362,961	41%	0%
- grant 2	A1	$ 5,434,603	$ 5,326,688	$ 5,434,603	$ 107,915	$ 107,915	2%	0%
Peru - grant 1	B1	$ 11,359,670	$ 10,055,990	$ 11,359,670	$ 1,303,681	$ 1,303,681	11%	0%
- grant 2	A2	$ 8,653,606	$ 8,007,008	$ 8,653,606	$ 646,598	$ 646,598	7%	0%
Guyana	B1	$ 3,282,857	$ 2,197,751	$ 3,183,376	$ 985,625	$ 1,085,106	33%	3%
Nicaragua	B1	$ 10,655,995	$ 9,401,529	$ 9,985,778	$ 584,249	$ 1,254,466	12%	6%
Guatemala	B1	$ 3,746,023	$ 3,383,258	$ 3,746,023	$ 362,764	$ 362,764	10%	0%
Haiti - grant 1	N/A	$ 45,055,551	$ 5,035,645	$ 5,198,717	$ 163,072	$ 40,019,906	89%	88%
- grant 2	A2	$ 21,661,161	$ 20,928,329	$ 20,939,123	$ 10,793	$ 732,832	3%	3%
El Salvador	A1	$ 4,574,369	$ 4,574,368	$ 4,574,369	$ 1	$ 1	0%	0%
Suriname - grant 1	A2	$ 3,303,000	$ 3,303,000	$ 3,303,000	$ -	$ -	0%	0%
- grant 2	N/A	$ 4,045,495	$ 1,227,450	$ 112,375	$ (1,115,075)	$ 2,818,045	70%	97%
Dominican Republic	A2	$ 10,630,744	$ 10,630,744	$ 10,630,744	$ -	$ -	0%	0%
Colombia - grant 1	A1	$ 3,538,489	$ 3,281,893	$ 2,889,766	$ (392,127)	$ 256,596	7%	18%
- grant 2	A1	$ 4,879,739	$ 4,417,703	$ 3,985,120	$ (432,583)	$ 462,036	9%	18%
Bolivia (Plurinational S	A2	$ 3,653,921	$ 3,438,564	$ 3,006,562	$ (432,002)	$ 215,357	6%	18%
Paraguay	N/A	$ 14,557,067	$ 10,625,107	$ 9,561,995	$ (1,063,112)	$ 3,931,960	27%	34%
Panama	N/A	$ 6,867,722	$ 1,927,755	$ 190,770	$ (1,736,985)	$ 4,939,967	72%	97%
Belize	N/A	$ 3,359,024	$ 1,887,349	$ 93,306	$ (1,794,043)	$ 1,471,675	44%	97%
Grand Total, sum		**$ 153,226,960**	**$ 100,082,730**	**$ 105,648,165**	**$ 5,565,434**	**$ 53,144,230**		

Source: The Global Fund database.

Notes:

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

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

3. There are 5 possible ratings for the performance of each grant given by the Global Fund: A1 – exceeds expectations, A2 – meets expectations, B1 – adequate, B2 - inadequate but potential demonstrated, and C – unacceptable

Chapter 9

Conclusions

This section presents the main conclusions about TB epidemiology, control, and financing in the Americas.

1. There have been considerable achievements in TB control in the Americas in the past few years. TB incidence, prevalence and mortality continue to decline in the Americas, and all the 2015 global targets for reducing the burden of disease have been met. However, despite considerable progress in the region as a whole, some countries are lagging behind. TB control efforts need to be sustained and intensified in high burden areas as well as in those with very low burden where elimination could be achieved.

2. Treatment success rate among new and relapse cases remains off-target in the Americas and is the lowest globally (together with the European region, both at 75%). The proportion of TB patients successfully treated is currently low in several countries, particularly in South America. Reducing the number of patients without treatment outcomes through adequate recording and reporting is imperative.

3. Considerable progress has been made in the Americas in rolling out rapid diagnostic tools. Further strengthening of conventional laboratory capacity and performance is needed, especially in countries in which laboratory capacity remains below the regional targets. Strengthening of laboratories should include further roll-out and implementation of rapid diagnostic tests, especially in countries with a high estimated burden of drug-resistant TB and TB/HIV.

4. Improving case detection and management of (multi)drug-resistant TB remains an urgent priority in the Americas. Currently, only about half of the MDR-TB cases estimated among notified PTB cases are being detected in the Americas. Scale-up of DST among new and re-treatment cases by means of conventional and rapid molecular methods is needed to improve detection. This in turn requires higher capacity to treat MDR-TB. Most countries need strengthening of treatment programs in order to improve treatment adherence and outcomes in MDR-TB patients through, for instance, adequate patient support strategies.

5. An increasing number of TB patients are being tested for HIV or know their HIV status. Test coverage should be further increased and CPT and ART scaled up among HIV-positive TB patients. Sustained action towards tackling the double burden of TB and HIV is needed, particularly in South America and in the Caribbean. Further, recording and reporting needs to be improved to allow for reliable assessment of the performance of TB/HIV collaborative activities, including the provision of CPT and ART to HIV-positive TB patients and the scale-up of intensified TB case finding and IPT among people living with HIV in the Americas.

6. Improving case finding (and diagnosis) of childhood TB is a priority for TB control in the Americas. Very low TB notification rates for childhood TB in some countries, particular among children less than 5 years old, suggest considerable under-diagnosis/low case detection. Training activities and increasing involvement of

general practitioners and pediatricians may serve to increase knowledge and awareness about the particular challenges of diagnosing pediatric TB as a means to increase case detection among children in the Americas. In addition, contact investigation and preventive therapy among children should be intensified as well as improved monitoring of treatment outcomes.

7. In countries struggling to control TB, the performance of the strategies implemented should be reviewed to identify the strengths and weaknesses of the interventions that have been put in place. As we are entering the era of the End TB Strategy, evaluating and improving the impact of TB prevention, care and control in these countries is the first important step towards a world free of TB.

8. Based on available financial information from selected countries it can be concluded that despite increasing funding for TB prevention and control, mostly from national sources and aimed at diagnosis and treatment of drug-susceptible TB, there are still important funding gaps. These are mainly for program management and laboratory infrastructure/equipment/supplies. The Global Fund is the main donor for eligible countries only.