TUBERCULOSIS
IN THE AMERICAS

2019 Regional Report

END TB

PAHO

Pan American
Health
Organization

World Health
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REGIONAL OFFICE FOR THE **Americas**

TUBERCULOSIS
IN THE AMERICAS

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DR-TB	drug-resistant tuberculosis
DST	drug susceptibility testing
EQC	external quality control
HIV	human immunodeficiency virus
LPA	line probe assay
LTBI	latent tuberculosis infection
MDR/RR-TB	multidrug-resistant or rifampicin-resistant tuberculosis
MDR-TB	multidrug-resistant tuberculosis
NTP	national tuberculosis program

PAHO	Pan American Health Organization
PDL	persons deprived of liberty
RR-TB	rifampicin-resistant tuberculosis
SDGs	Sustainable Development Goals
TB	tuberculosis
TPT	tuberculosis preventive treatment
USAID	United States Agency for International Development
WHO	World Health Organization
XDR-TB	extensively drug-resistant tuberculosis

Introduction

This report by the Pan American Health Organization (PAHO) presents the situation of tuberculosis in the Region of the Americas and the progress made by the countries of the Region in the prevention and control of the TB epidemic and toward the elimination of TB as a public health problem.

The document is based on data notified by countries of the Region to the World Health Organization (WHO) as inputs for development of the Global TB Report 2019, which contains general information on the different regions of the world. This report aims to provide consolidated and detailed information on the countries of the Americas and a specific analysis of issues related to TB prevention, control, and elimination.

This publication highlights the most important key issues that countries must take into account in accelerating progress towards the global goals and commitments of the End TB Strategy and the political declaration of the United Nations General Assembly High-Level Meeting on Tuberculosis, held in 2018.

1

Moving toward global commitments and targets to end TB

1.1 Global commitments to TB control

In May 2014, the Sixty-seventh World Health Assembly adopted the *Global strategy and targets for tuberculosis prevention, care and control after 2015*, subsequently known as the End TB Strategy, with the goal of ending the tuberculosis (TB) epidemic. This goal is enshrined in target 3.3 of the Sustainable Development Goals (SDGs): " By 2030, end the epidemics of [...] tuberculosis". The End TB Strategy has set milestones (2020 and 2025) and targets (2030 and 2035) for the reduction of TB incidence and mortality. In addition, the Strategy sets forth that, by 2020, no TB patients or their families should have to face catastrophic costs as a result of the disease (Table 1.1).

Table 1.1 Vision, goal, milestones, and targets of the End TB Strategy

Vision	A world free of TB: zero deaths, disease, and suffering due to TB			
Goal	End the global TB epidemic			
Indicators	Milestones (%)		Targets (%)	
	2020	2025	SDG 2030	END TB 2035
Reduction in number of TB deaths compared with 2015 (%)	35	75	90	95
Reduction in TB incidence rate* compared with 2015 (%)	20	50	80	90
TB-affected families facing catastrophic costs due to TB (%)	0	0	0	0

* Per 100,000 population.

The United Nations General Assembly High-Level Meeting on Tuberculosis, held on 26 September 2018, concluded with a consensus political declaration by the Member States of the United Nations. It reaffirmed their existing commitments to the SDGs and the WHO End TB Strategy. The political declaration of the High-Level Meeting included, among others, the following global commitments[1]:

➡ successfully treating 40 million people with tuberculosis from 2018 to 2022, with a special focus on reaching those who are vulnerable and the marginalized populations and communities;

➡ providing preventive treatment to at least 30 million people by 2022;

➡ raise at least USD 13 billion a year by 2022 for universal access to TB diagnosis, treatment, and care; and

➡ mobilize at least USD 2 billion a year for TB research.

The declaration also requested the Secretary-General of the United Nations, with the support of WHO, to provide a report to the General Assembly in 2020 on global and national progress, which would serve to inform preparations for a more comprehensive report with a view to holding a new high-level meeting in 2023. In addition, WHO was tasked with finalizing development of a multisectoral accountability framework for TB and monitoring its timely implementation[2].

1.2 Targets for ending TB in the Region of the Americas

The proposed milestones and targets for the Region of the Americas are set out in Table 1.2, while current trends are shown in Figures 1.1 and 1.2.

Table 1.2 Global indicators of the End TB Strategy for the Region of the Americas

Global indicators	Baseline	Current situation	Milestones		Sustainable Development Goal targets	End TB Strategy targets
	2015	2018	2020	2025	2030	2035
Reduction in number of TB deaths compared with 2015 (percentage and absolute number)	24 900	22 900	35% 16 200	75% 6 200	90% 2 500	95% 1200
Reduction in TB incidence rate* compared with 2015 (percentage and absolute number)	27.5	28.7	20% 22.0	50% 13.8	80% 5.5	90% 2.8
Percentage of TB-affected households experiencing catastrophic costs due to TB	N/A	N/A	0	0	0	0

N/A: Not available.
*Per 100,000 population.
Source: Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

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1   United Nations. Political declaration of the high-level meeting of the General Assembly on the fight against tuberculosis. Resolution A73/3. October 2008. Available from: http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/73/3.
2   World Health Organization. Multisectoral accountability framework to accelerate progress to end tuberculosis by 2030. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/MultisectoralAccountability/en/.

At the current rate of decline in the number of TB deaths and incidence of TB, the proposed targets and milestones will not be achieved. However, achievement of the 2025 milestones remains a feasible, though ambitious, proposition, with proper implementation and scaling-up of existing tools, supplemented by the achievement of universal health coverage and the implementation of initiatives to address the determinants and social consequences of TB. Subsequently, a greater impact on TB will also require new tools such as vaccines, point-of-care diagnostic tests—for both infection and disease—and shorter treatment schemes for TB and latent TB infection (LTBI)[3].

> *At the current rate of decline in the number of TB deaths and incidence of TB, the proposed targets and milestones will not be achieved. However, the 2025 milestones, though ambitious, are still achievable.*

Between 2009 and 2018, deaths decreased in the Region by 2.6% a year on average. To reach the 2020 milestone, a yearly reduction on the order of 14% since 2018 would have been required (Figure 1.1).

Figure 1.1. Trend and projection of estimated number of TB deaths and the reduction needed to achieve milestones and targets in the Region of the Americas, 2000-2035
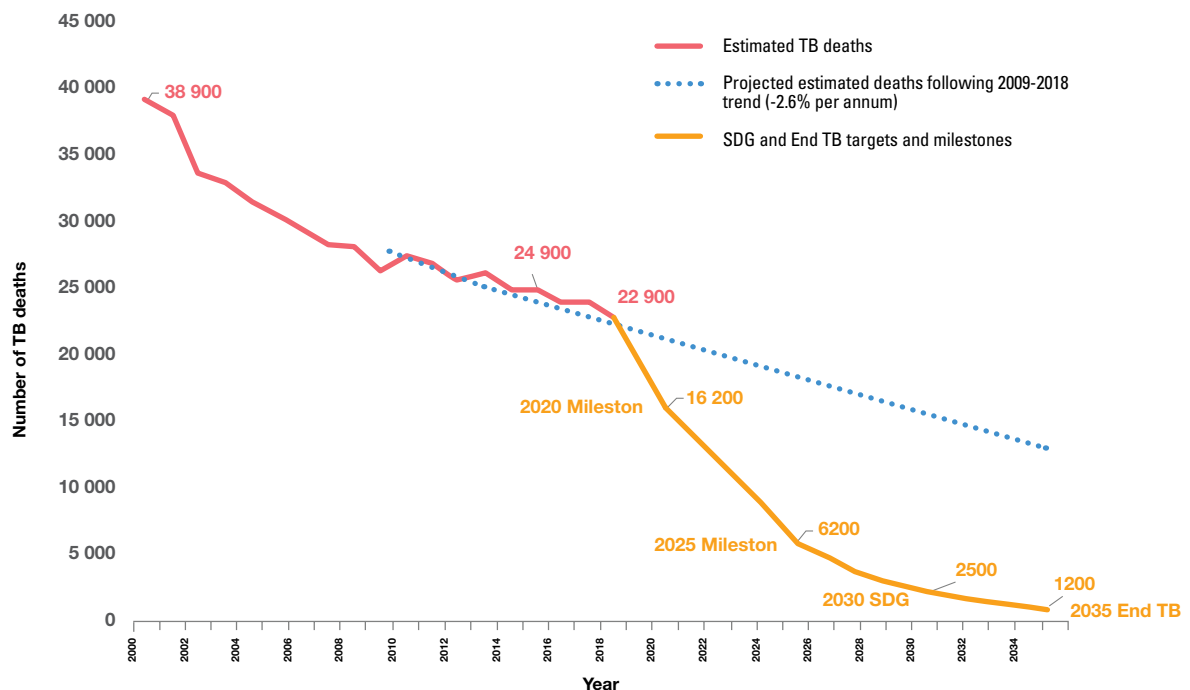
Nota: Projections made by the PAHO/WHO Collaborating Centre for Epidemiology and Control of Tuberculosis, Instituto Nacional de Enfermedades Respiratorias "Emilio Coni", Argentina, based on 2019 WHO estimates
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

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3   World Health Organization. Multisectoral accountability framework to accelerate progress to end tuberculosis by 2030. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/MultisectoralAccountability/en/.

The estimated incidence rate of TB also declined slowly between 2009 and 2018, with an average annual decline of 0.3%. However, in the last five years, there has been an uptick in the annual incidence of 1.5%. To achieve the 2020 milestone, a 12% yearly reduction since 2018 would have been required (Figure 1.2).

Figure 1.2. Trend and projection of estimated TB incidence rate needed to achieve milestones and targets in the Region of the Americas, 2000-2035
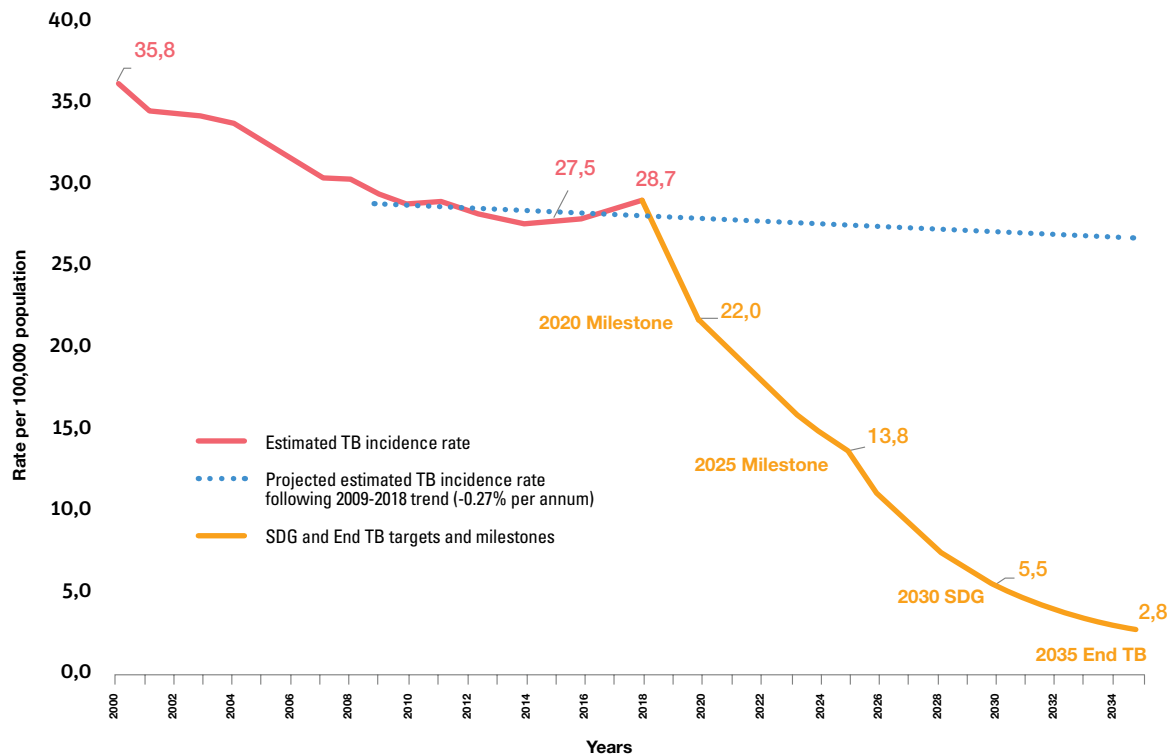
Nota: Projections made by the PAHO/WHO Collaborating Centre for Epidemiology and Control of Tuberculosis, Instituto Nacional de Enfermedades Respiratorias "Emilio Coni", Argentina, based on 2019 WHO estimates.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Some countries in the Region have already begun conducting national surveys to measure the percentage of households experiencing catastrophic costs due to TB, using the methodology recommended by WHO[4]. However, at the time of writing, no country had results available.

> *Some countries in the Region have already begun conducting national surveys to measure the percentage of households facing catastrophic costs.*

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4   World Health Organization. Tuberculosis patient cost surveys: a handbook. Geneva: WHO; 2018. Available from: https://www.who.int/tb/publications/patient_cost_surveys/.

2 TB mortality and incidence rates

2.1 Estimated TB mortality and fatality rates

Globally, an estimated 1.5 (1.4-1.6) million people died from TB in 2018, including 251,000 (223,000-281,000) with HIV. In the same year, there were an estimated 22,900 (21,200-25,600) TB deaths in the Region of the Americas, of which 26% (5,900) were of people with TB/HIV co-infection. As shown in Figure 1.1, TB deaths have been following a downward trend. It is estimated that 1,000 fewer TB deaths occurred in the Region in 2018 compared to 2017. This difference is largely explained by a decrease in estimated deaths in Brazil (200), Mexico (100), and Peru (100).

Figure 2.1. Estimated and notified* TB and TB/HIV mortality rate, Region of the Americas, 2010-2018
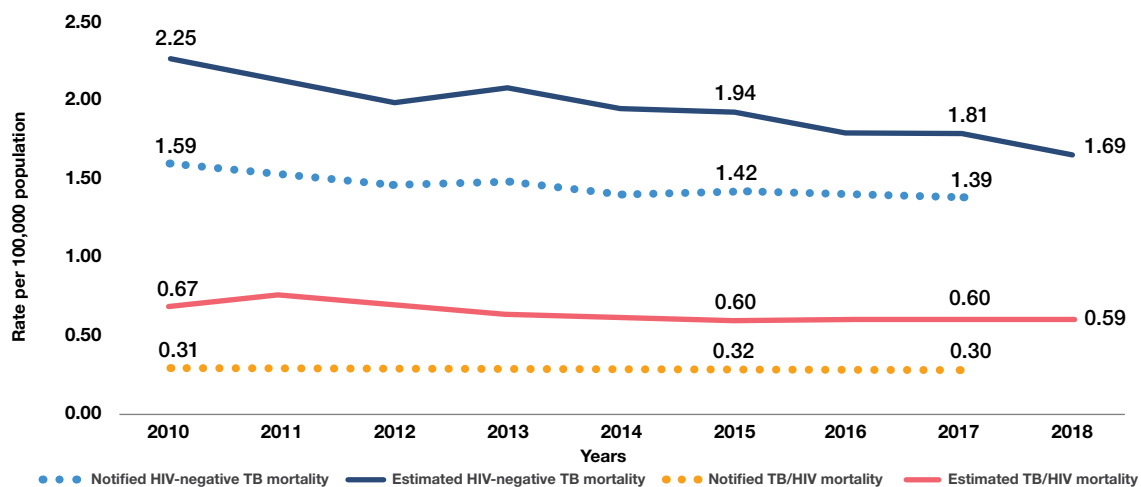
*Countries with information on TB deaths in 2017.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Between 2010 and 2018, the average rate of decline in the estimated TB mortality rate was 3.1% per year for deaths without HIV coinfection (Figure 2.1). The decrease in mortality associated with TB/HIV coinfection over the same period was less marked, at an average of 2.4% per year.

Figure 2.2 shows the estimated TB mortality rate for countries in the Region, with intervals ranging from less than 1 death per 100 ,000 population (Canada, Cuba, and the United States) to 10 or more deaths per 100 ,000 (Bolivia [Plurinational State of], Guyana, and Haiti).

Figure 2.2. Estimated TB mortality rate, Region of the Americas, 2018
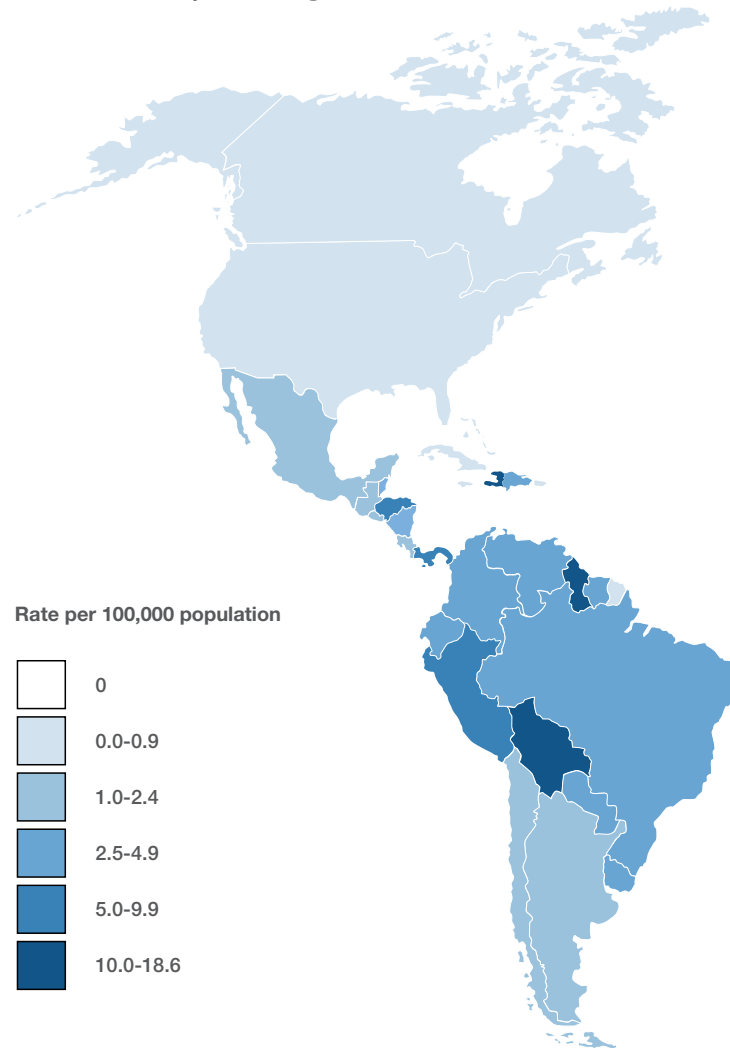
Rate per 100,000 population

	0
	0.0-0.9
	1.0-2.4
	2.5-4.9
	5.0-9.9
	10.0-18.6

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The case fatality rate[5] is an indicator of access to timely diagnosis and appropriate treatment of TB. In 2018, the estimated case fatality rate for the Region was 7.9%; in recent years, the case-fatality rate has been on a downward trend (Figure 2.2), and indeed was 22% lower in 2018 than in 2010 (10.2%) (Figure 2.3). The target proposed by the End TB Strategy is a fatality rate of 5% or less by 2025.

Figure 2.3. Trend of estimated TB case fatality rate, Region of the Americas, 2010-2018
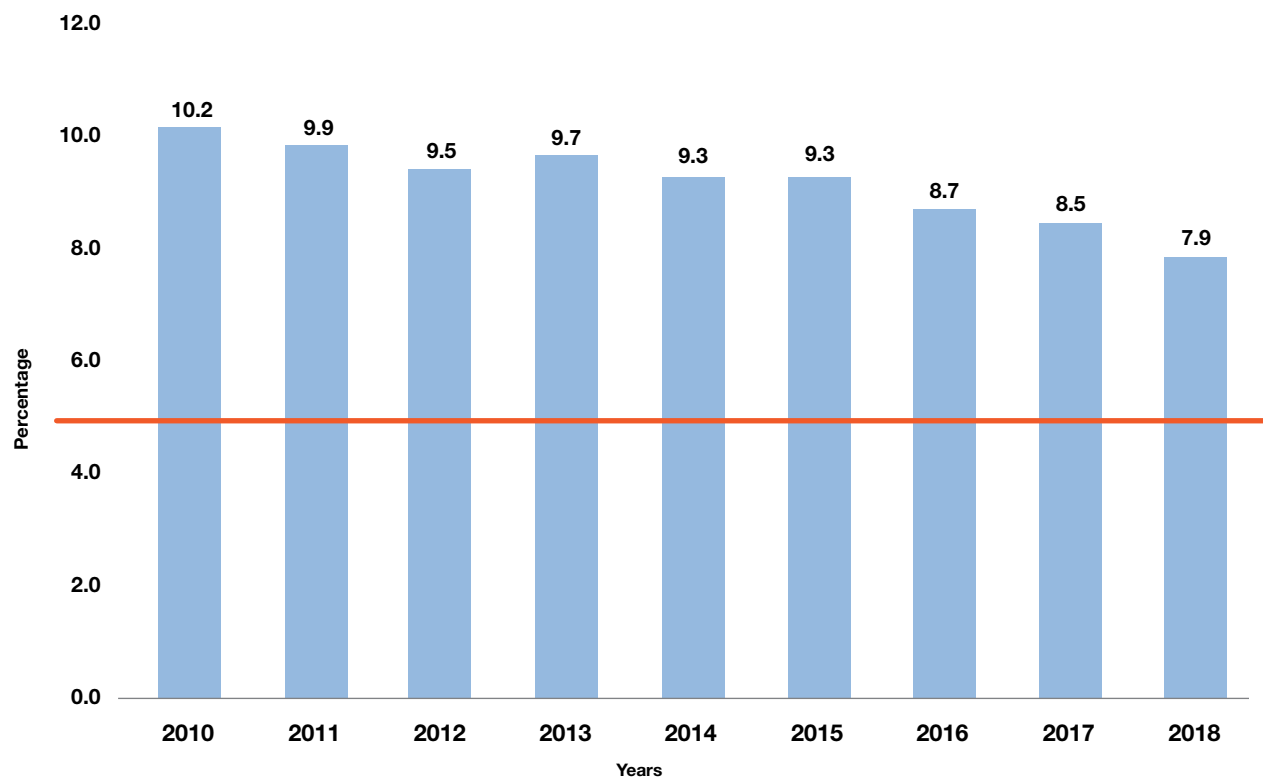
Proposed target for 2025.

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

As shown in Figure 2.4, in 2018 only one country had an estimated case fatality rate below 5% (El Salvador). In 15 of the 30 countries analyzed, the estimated case fatality rate was 10% or higher.[6] In four of the five countries with the highest estimated case fatality rates in the Region, the proportion of TB/HIV co-infection was also high: 34% in Belize, 19% in Guyana, 23% in Jamaica, and 18% in Panama. These percentages well above the regional average of 10% may have an influence on the high TB fatality rates. An analysis of the association of different factors with case fatality concluded that TB fatality rates are directly related to TB burden and the proportion of TB/HIV coinfection, and inversely related to the treatment success rate. If TB mortality and incidence reduction targets are to be achieved, the case fatality rate must continue to decline.

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5   The TB case fatality rate was calculated by dividing the total number of estimated deaths (in people with or without HIV) by the number of estimated cases in each country.
6   Countries with an estimated 10 deaths or more in 2018.

Figure 2.4. Estimated TB case fatality rate in selected countries*, Region of the Americas, 2018

— Proposed target for 2025.

*Countries with 10 or more cases of TB.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

2.2 Notified TB mortality

Vital statistics from countries in the Region are another source of TB mortality information. Data from 17 countries show that 12.648 non-HIV-associated TB deaths (70% of the estimated 18,000 deaths) and 2752 HIV-associated deaths (46% of the estimated 6000 TB/HIV coinfections) were recorded in 2017.[7] These figures reflect the limitations of vital statistics systems for properly identifying and encoding TB deaths, especially those occurring in the presence of HIV coinfection.

Similar to estimated mortality outcomes, the notified non-HIV-associated TB mortality rate has also followed a downward trend, with an average rate of decline of 1.8% per year in countries for which information is available. Mortality rates in patients co-infected with TB/HIV declined more slowly during the period of analysis (see Figure 2.1).

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7   Countries with mortality information in 2017: Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, United States of America, and Uruguay.

2.3 Estimated TB incidence

It is estimated that, in 2018, there were 10 million (9.0-11.1) incident cases of TB worldwide. Of these, 5.7 million were men and 3.2 million were women 15 years of age or older, and 1.1 million were under the age of 15. People with HIV accounted for 9% of all new TB infections. The distribution of estimated TB cases by WHO geographic region is shown in Figure 2.5.

Figure 2.5. Distribution of estimated TB cases by WHO geographic region, 2018
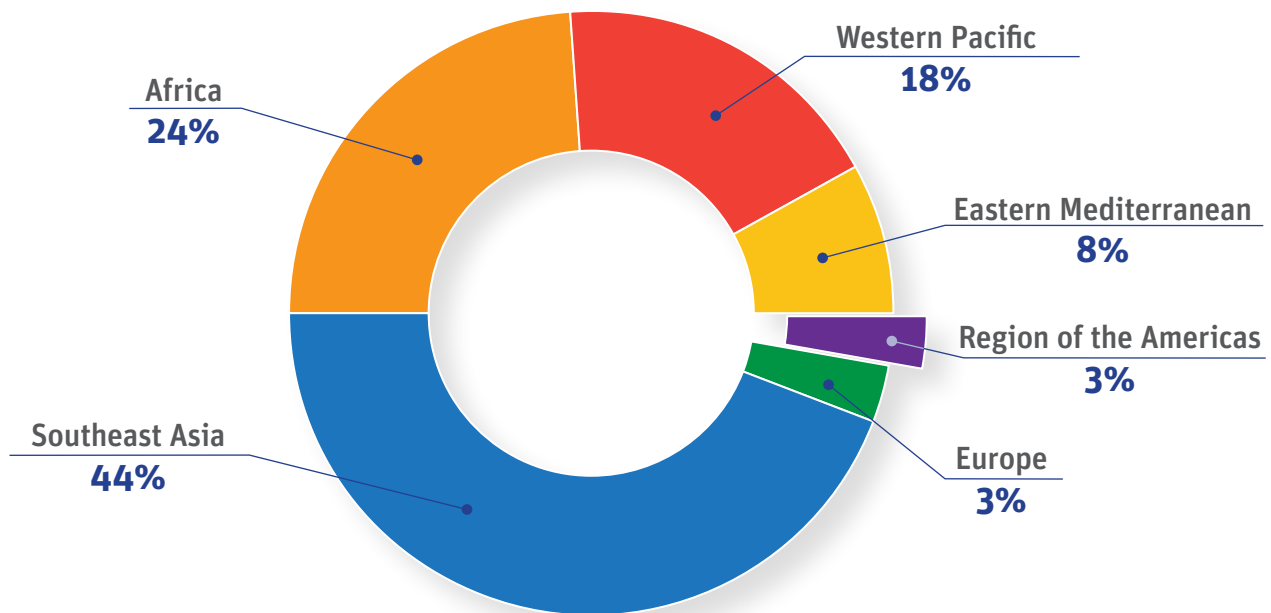
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In the Region of the Americas, there were an estimated 289,000 incident cases of TB in 2018 (3% of global cases). Of these, 185,000 (64%) occurred in men aged 15 or older. 15,000 (5.5%) were children or adolescents under the age of 15. The estimated incidence rate for the Region was 28.7 per 100,000 population, with an upward trend over the last 5 years (see Figure 1.2). Between 2017 and 2018, the number of estimated TB cases in the Americas increased 2.5% (an estimated 8,000 extra cases of TB), mainly due to an increase in estimates for Brazil (4,000), Peru (2,000), Mexico (1,000), and the Bolivarian Republic of Venezuela (1,000).

In 2018, 69% of estimated TB cases occurred in five countries (Brazil, Peru, Mexico, Haiti and Colombia) and 86% occurred in 12 countries (see Table 2.1).

Regarding the estimated incidence rate of TB, Figure 2.6 shows that the highest estimated rates in the Region in 2018 were for Haiti (179.8), Peru (121.9), and the Plurinational State of Bolivia (105.7), all with more than 100 cases per 100,000 population. Fifteen nations had an estimated incidence rate of 10 cases per 100,000 population or less and were thus classified as low-incidence countries.[8] These included Jamaica (2.9), the United States (2.9), Canada (5.6), Cuba (7.2), and Costa Rica (10.0) (see Figure 2.6).

Figure 2.6. Estimated TB incidence rate, Region of the Americas, 2018
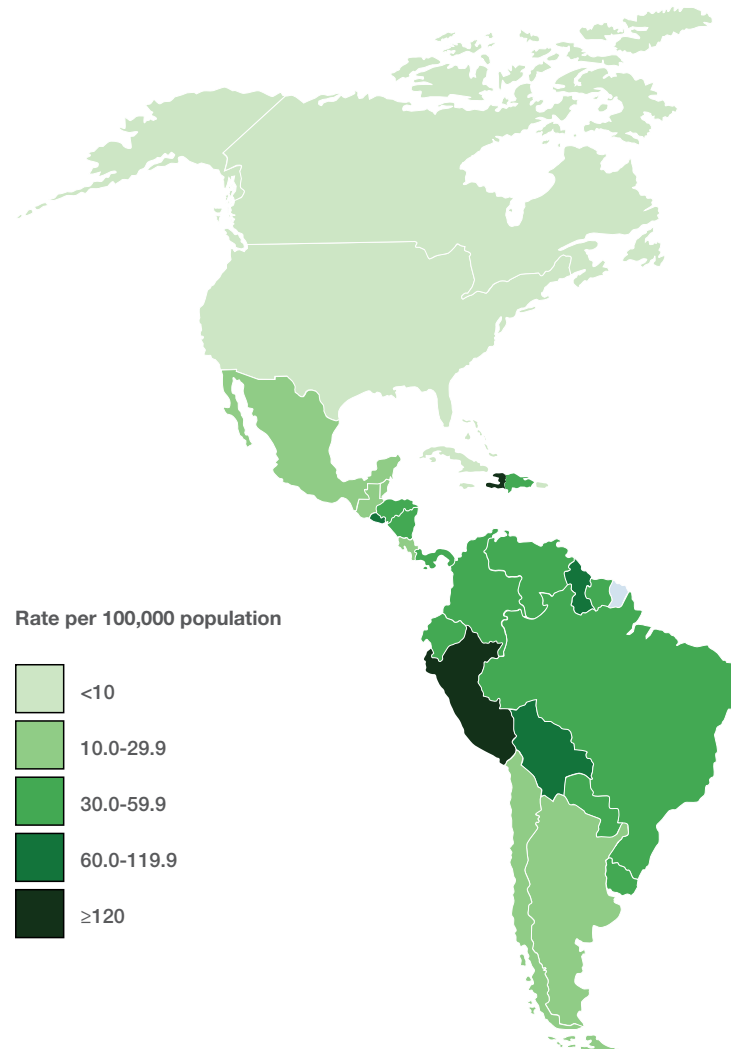
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

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8   Countries with an estimated 50 or more TB cases in 2018.

2.4 Notified TB incidence

In 2018, 235,345 new and relapse TB cases were notified in the Region of the Americas, which represents a 2% increase in the number of cases compared to 2017 (230,828). The absolute increase in TB cases in the Region is attributable to Brazil (3,187), Peru (1,581), Mexico (514), and the Bolivarian Republic of Venezuela (370). However, the relative increase from 2017 to 2018 was higher for Suriname and Trinidad and Tobago (>20%) and for Chile and Uruguay (7%).

The notified incidence was 23.4 per 100,000 population, increasing at a rate of 1.0% a year between 2014 and 2018 (Figure 2.7).

Figure 2.7. **Trend of notified TB incidence rates for all cases and for TB/HIV coinfected cases, Region of the Americas, 2010-2018**
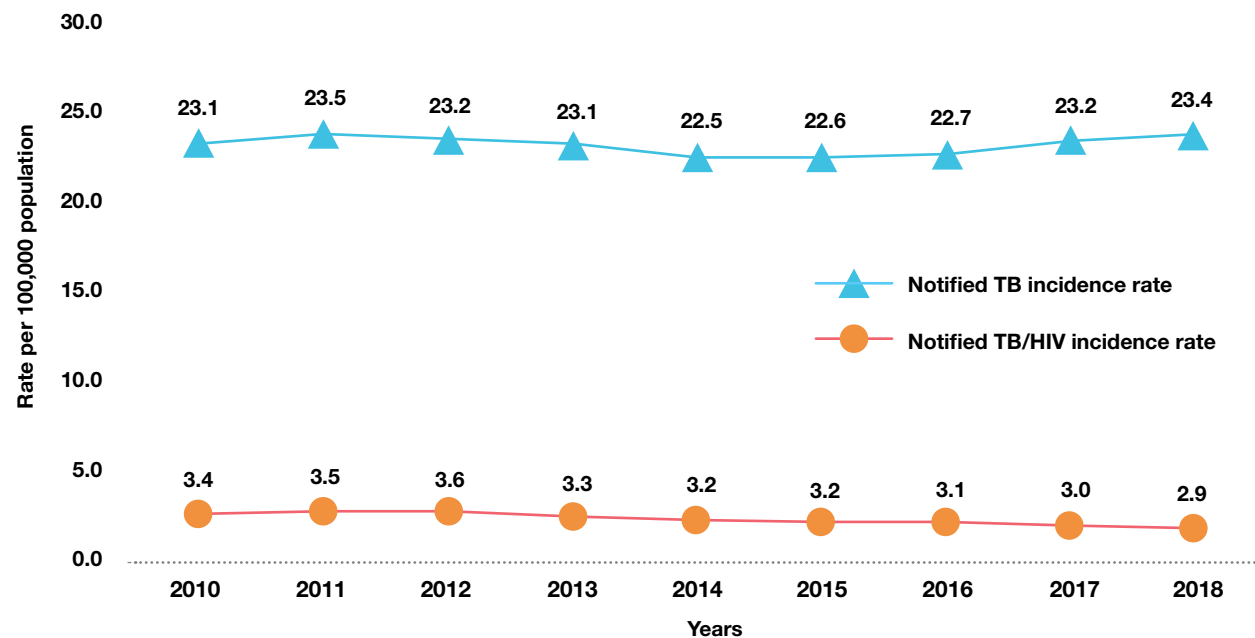
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The distribution of the notified TB incidence rate per country in 2018 is shown in Figure 2.8. Four countries – Bolivia (Plurinational State of), Guyana, Haiti, and Peru – are in the 90th percentile, with rates three times the regional average or higher. Conversely, seven countries are in the 10th percentile, with rates of less than 3 cases per 100,000 population.

Figure 2.8. Notified TB incidence rate, Region of the Americas, 2018

Country	Rate per 100,000 population
Haiti	120.3
Peru	98.2
Bolivia (Plurinational State of)	66.9
Guyana	66.2
El Salvador	56.3
Panama	41.3
Brazil	39.3
Venezuela (Bolivarian Republic of)	38.1
Paraguay	37.2
Dominican Republic	36.3
Ecuador	34.9
Nicaragua	32.6
Suriname	30.2
Honduras	29.6
Uruguay	29.0
Colombia	26.2
Belize	25.8
Region of the Americas	23.4
Argentina	23.3
Guatemala	20.7
Mexico	18.4
Trinidad and Tobago	18.2
Sint Maarten	16.7
Chile	15.7
Bahamas	12.2
Costa Rica	8.0
Cuba	6.3
Dominica	5.6
St. Vicent and the Granadines	5.4
Antigua and Barbuda	5.2
Canada	4.8
Aruba	4.7
St. Lucia	2.7
United States of America	2.6
Jamaica	2.4
Grenada	1.8
Puerto Rico	0.8
Barbados	0.3
St. Kitts and Nevis	0.0

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The notified incidence of TB by age group reflects a pattern of transmission with greater impact on young people and a male predominance. The risk of TB is highest in the age group 25 to 34 years, both in men and in women. The male-to-female ratio increases from the age of 15 upwards, and is 2:1 or higher by age 25 (Figure 2.9).

Figure 2.9. Notified TB incidence rates, by age and sex, Region of the Americas, 2018
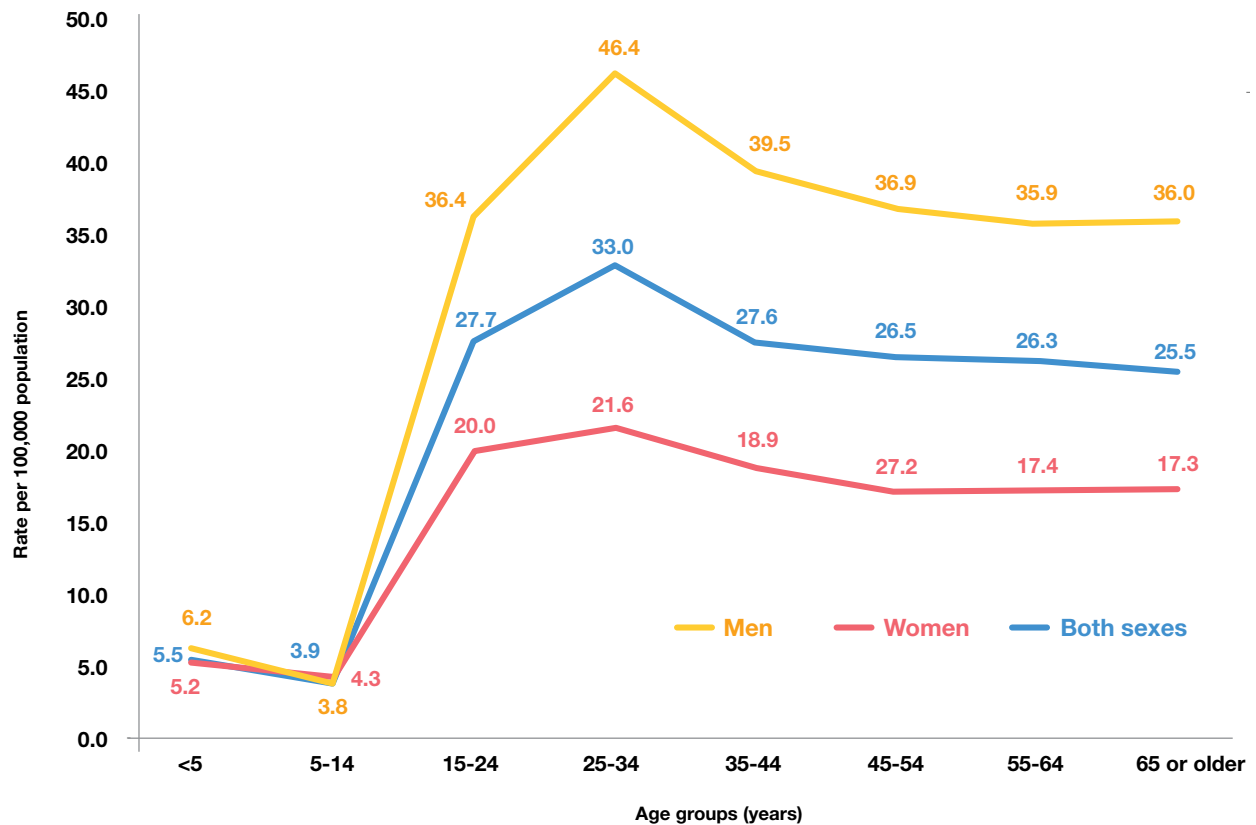
The behavior of notified incidence over time was not similar in all age groups (Figure 2.10). In young adults (15-44 years), there was a sharper increase than other groups during the period 2013-2018, with the rate rising more than 2% per year in the 15-to-24 and 25-to-34 age groups. A smaller, but still significant, increase in rates occurred in the 35-to-44 and 55-to-64 age groups. The rest of the age groups analyzed show a stable trend.

Figure 2.10. Trend in notification rate for new and relapse TB cases, by age group, Region of the Americas, 2013-2018
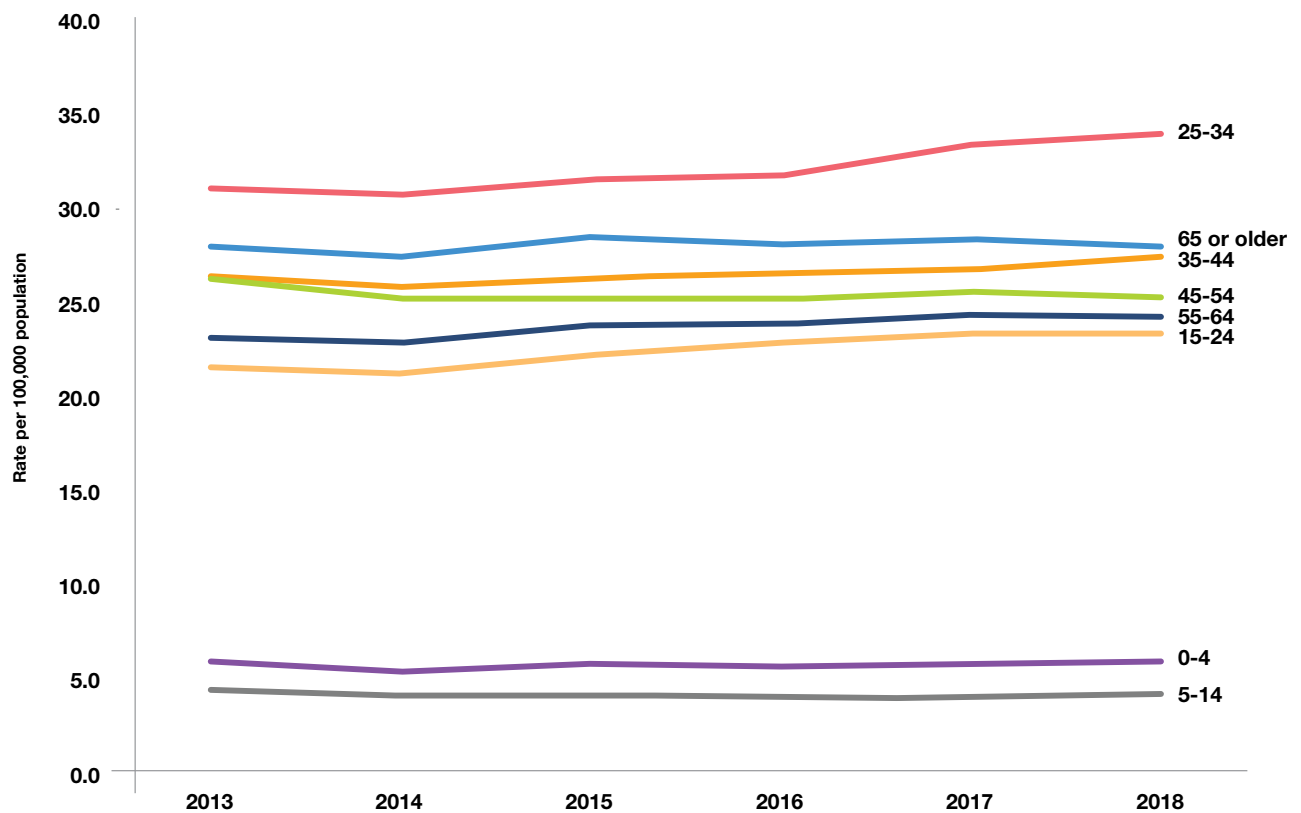
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The rate of TB detection, given as the percentage of cases diagnosed among the number of estimated cases, was 81.4% in 2018. This corresponds to a gap of 53,500 undiagnosed cases in the Americas, similar to that recorded over the last 10 years. The detection rate is below 70% in only two countries: Bolivia (Plurinational State of) and Haiti (Figure 2.11).

Figure 2.11. **TB detection rate in selected countries*, Region of the Americas, 2018**

Country	Detection rate
Belize	90%
United States of America	87%
Trinidad and Tobago	87%
Bahamas	87%
Brazil	87%
Chile	87%
Cuba	87%
Paraguay	86%
Puerto Rico	86%
Argentina	86%
Canada	86%
Uruguay	84%
Region of the Americas	81%
Colombia	81%
Nicaragua	81%
Honduras	81%
Guyana	81%
Peru	81%
Ecuador	81%
Dominican Republic	80%
El Salvador	80%
Mexico	80%
Jamaica	80%
Costa Rica	80%
Guatemala	79%
Suriname	79%
Venezuela (Bolivarian Republic of)	79%
Panama	78%
Haiti	67%
Bolivia (Plurinational State of)	63%

Percentage of reported TB cases relative to estimated cases

*Countries with 10 or more estimated TB cases in 2018.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The detection rate was not homogeneous with regard to sex and age. It was higher in men than in women, at 82.8% and 79.1%, respectively, and was also higher in young adults, peaking in the 25-to-34 age group (87.6% in men and 83.7% in women). The lowest detection rates are found among children under 5, at 60% for both sexes (Figure 2.12).

Figure 2.12. TB detection rate, by age and sex, Region of the Americas, 2018
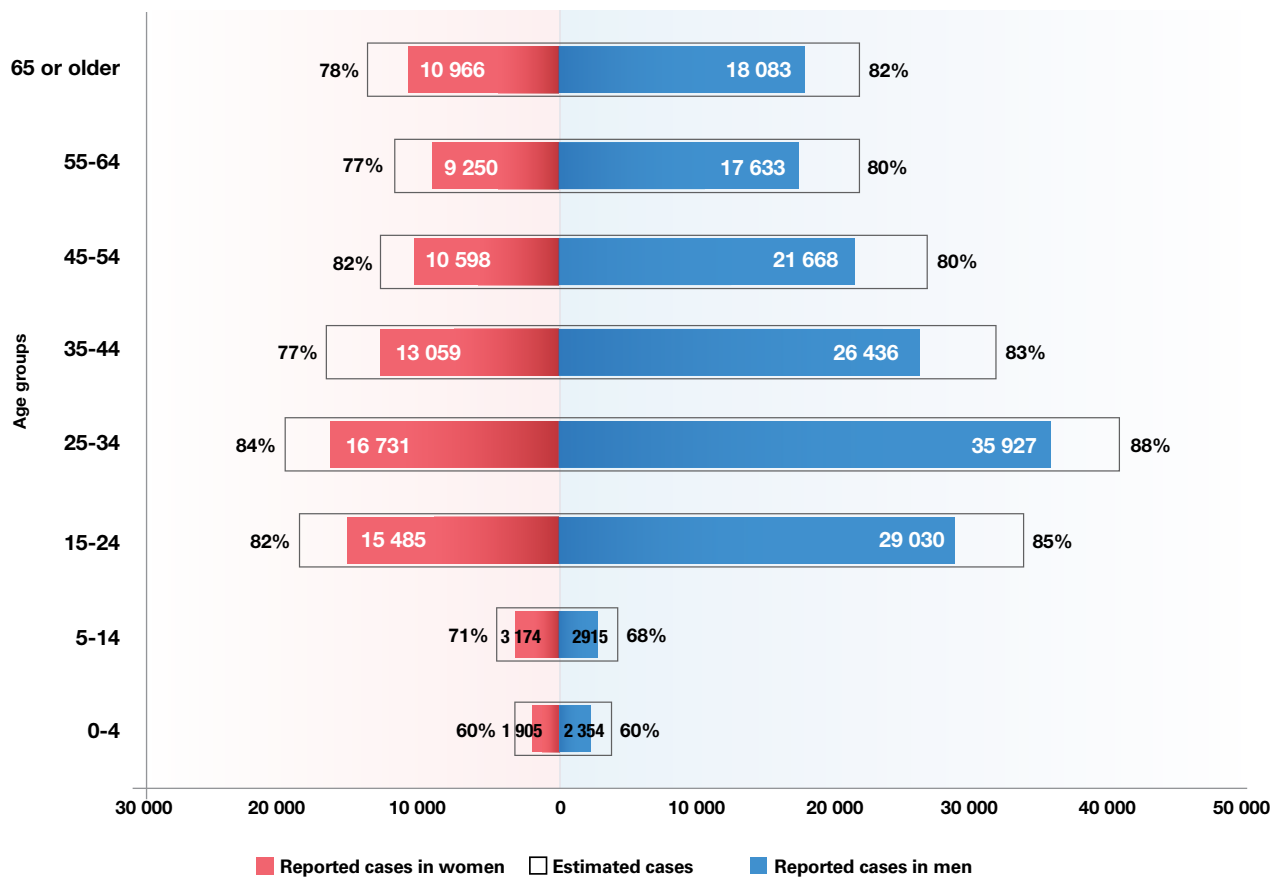
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

2.5 High TB burden countries

High-burden countries are those with an estimated absolute number of TB cases greater than 10,000 per year and those with an incidence rate of more than 45 per 100,000 population. Twelve countries (Table 2.1), which account for 86.3% of estimated TB cases, meet this criterion.

Table 2.1. High TB burden countries, Region of the Americas, 2018

| Country	Estimated number of TB cases	TB incidence rate*	Percentage of total TB cases estimated in the Region	Cumulative percentage of estimated cases	Number of cases notified	Estimated detection gap in the Region (as percentage)	Cumulative detection gap (as percentage)
Brazil	95 000	45.4	32.9	32.9	82 409	23.5	23.5
Peru	39 000	121.9	13.5	46.4	31 421	14.1	37.6
Mexico	29 000	23.0	10.0	56.4	23 271	10.7	48.3
Haiti	20 000	179.8	6.9	63.3	13 383	12.3	60.6
Colombia	16 000	32.2	5.5	68.8	13 025	5.5	66.1
Venezuela (Bolivarian Republic of)	14 000	48.5	4.8	73.6	11 017	5.6	71.7
Argentina	12 000	27.1	4.2	77.8	10 320	3.1	74.8
Bolivia (Plurinational State of)	12 000	105.7	4.2	82.0	7597	8.2	83.0
Dominican Republic	4800	45.2	1.7	83.7	3857	1.8	84.8
El Salvador	4500	70.1	1.6	85.3	3615	1.6	86.5
Panama	2200	52.7	0.8	86.1	1723	0.9	87.3
Guyana	640	82.2	0.2	86.3	516	0.2	87.6
Total, high-burden countries	249 140	46.6	86.3		202 154	87.6	
Total, Region of the Americas	289 000	28.7			235 345		

*Per 100,000 population.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The 12 high-burden countries account for 87.6% of the Region's case detection gap (47,000). Among these, four countries (Brazil, Peru, Mexico, and Haiti) accounted for 61%.

The behavior of countries with high TB burdens is different from that of the rest of the Region. The increase in the estimated regional incidence rate observed between 2014 and 2018 was due to this group

of countries. Conversely, no such behavior is seen in low-incidence countries, where rates declined, or in the rest of the Region, where the rate remained stable (Figure 2.13). The increased incidence of TB in the Region is considered to be predominantly due to two factors:

1. The implementation of more sensitive rapid molecular diagnostic methods, such as Xpert® MTB/RIF testing, which have increased the early detection of TB among vulnerable groups; and

2. In some countries, there has been increased transmission due to persistent deterioration of socioeconomic conditions, fragmentation of health systems, late diagnosis, and increased rates of comorbidity and co-infection, among other causes.

Figure 2.13. Trend in estimated TB incidence in high-burden countries, low-incidence countries, and countries with medium burden, Region of the Americas, 2010-2018
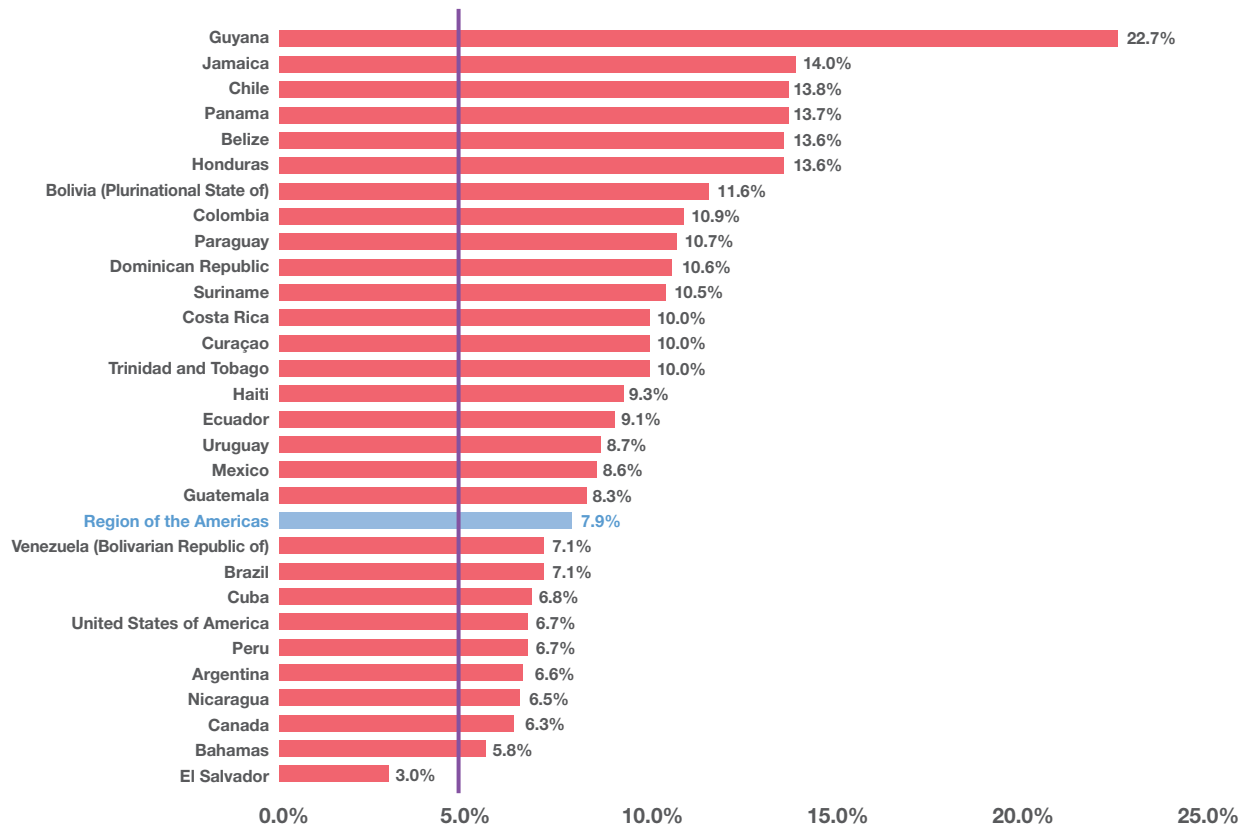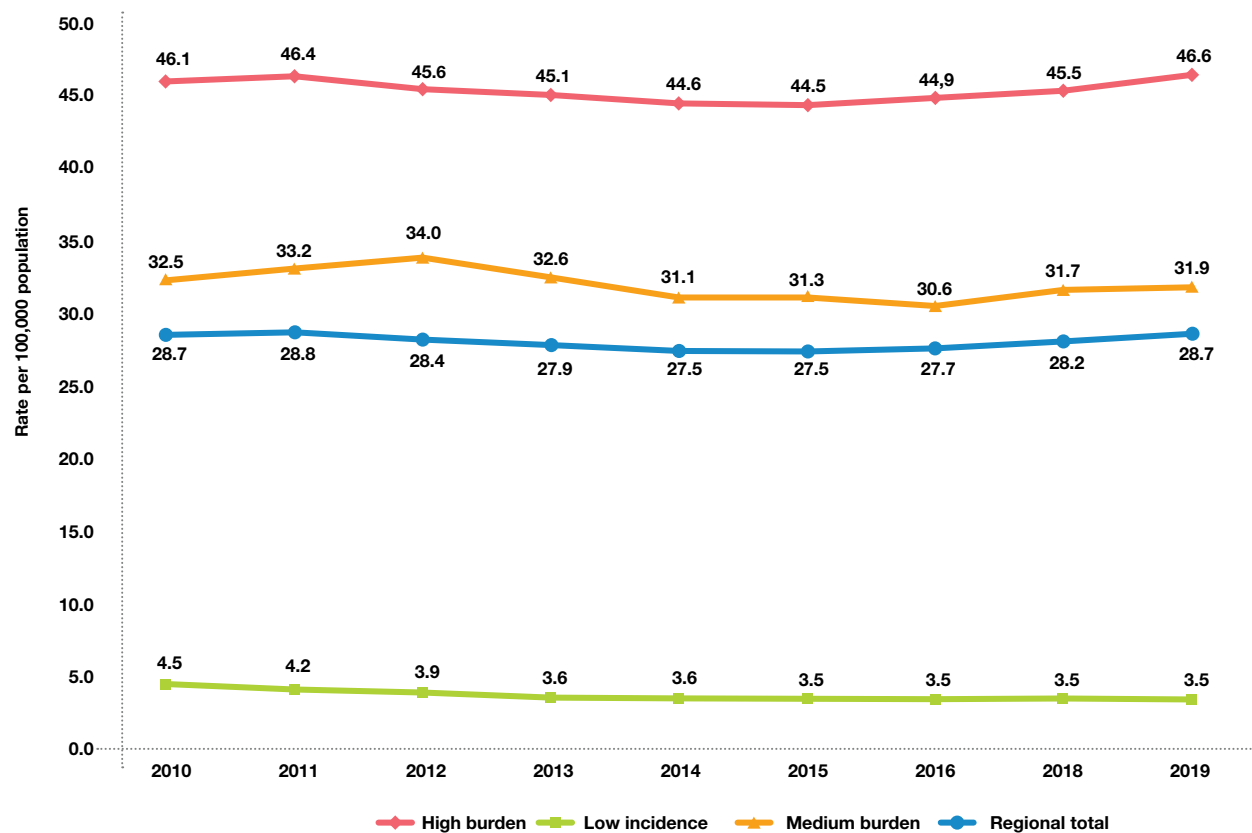

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Seven high-burden countries have seen an increase in the notified incidence rate between 2014 and 2018: 82% in the Bolivarian Republic of Venezuela, 58% in El Salvador, 6% each in Brazil and Mexico, and 5% in Argentina (Figure 2.14).

Figure 2.14. Trend in notified incidence rate of TB, selected high-burden countries, Region of the Americas, 2014-2018
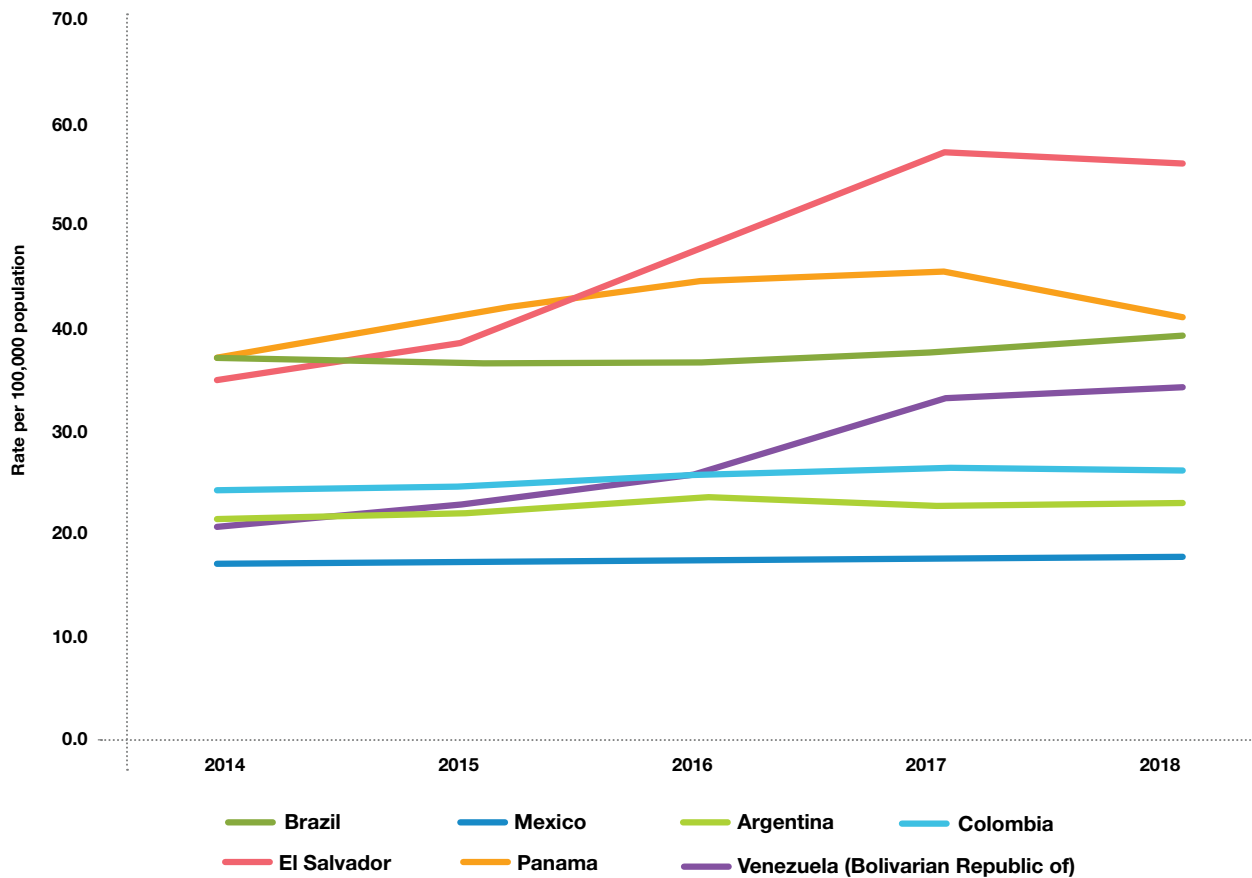
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

2.6 Low TB-incidence countries

Fifteen countries in the Region of the Americas had a low incidence of TB (10 cases or fewer per 100,000 population) in 2018, most of them in the Caribbean. Given this low incidence, these countries are closest to achieving elimination of TB as a public health problem (Table 2.2).

Table 2.2. Low TB-incidence countries, Region of the Americas, 2018

Country	TB incidence rate (per 100,000 population)	Number of estimated TB cases
Costa Rica	10.0	500
Cuba	7.2	820
Dominica	7.0	5
St. Vincent and the Grenadines	6.4	7
Antigua and Barbuda	6.2	6
Curaçao	6.1	10
Aruba	5.7	6
Canada	5.7	2 100
Saint Lucia	3.3	6
United States of America	3.0	9 800
Jamaica	2.9	86
Grenada	1.8	2
Puerto Rico	1.0	29
Barbados	0.3	1
Saint Kitts and Nevis	0.0	0
Total, low-incidence countries	**3.5**	**13 378**
Total, Region of the Americas	**28.7**	**289 000**

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The trend in estimated incidence in these countries, unlike in the region overall, continued to decline at an average annual rate of 2.9% between 2010 and 2018 – almost twice the average rate of decline for the Region as a whole (1.4%). In this period, the largest average annual decline was seen in Costa Rica (4.7%), followed by the United States (3.8%). Conversely, during the same period, Canada recorded a yearly increase in incidence of 2.3% (Figure 2.15).

Figure 2.15. Trend of estimated TB incidence in selected low-incidence countries, Region of the Americas, 2010-2018
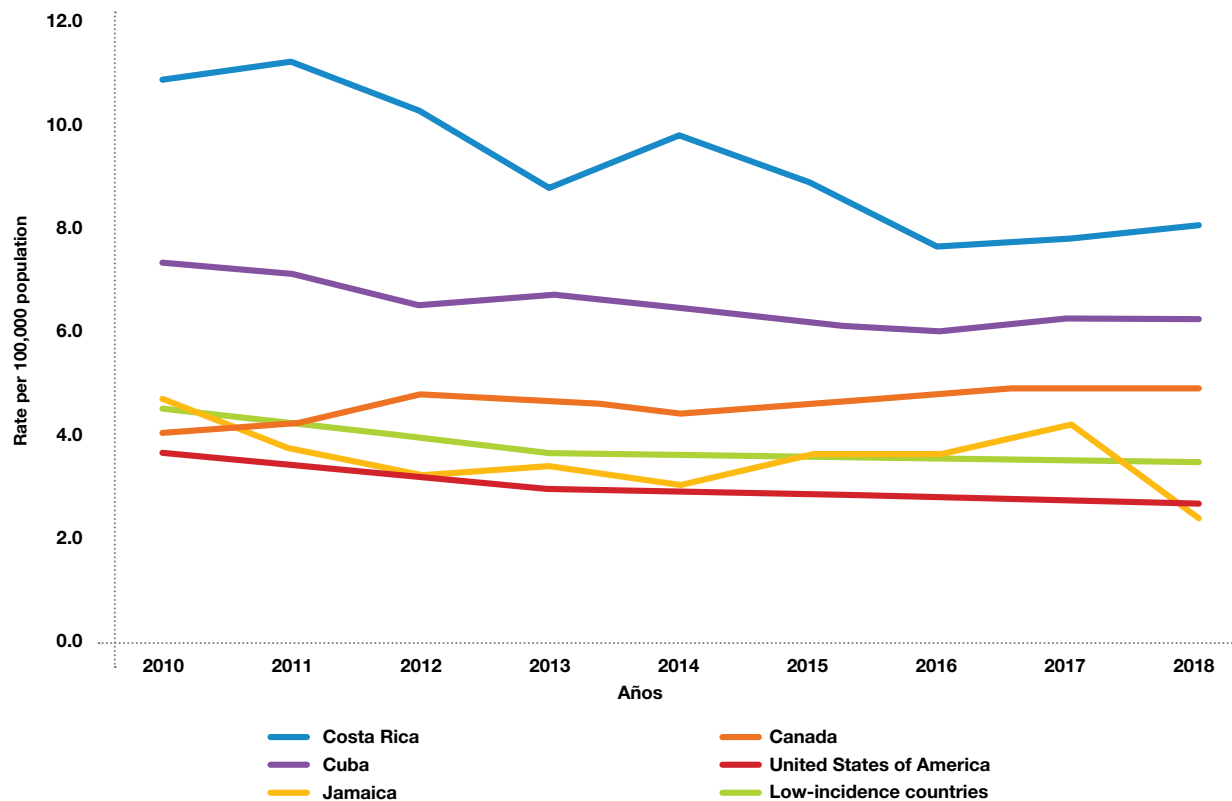
Table 2.3 lists other selected TB indicators in these countries.

Table 2.3   Selected indicators for countries with low TB incidence in the Region of the Americas, 2018

| Indicators	Region of the Americas (%)	Low TB incidence countries (%)
Case detection rate	81	87
Case fatality rate	7.9	7.0
Mortality rate	2.27*	0.24*
Percentage of TB cases with TB/HIV co-infection	10	6
Percentage of TB deaths with TB/HIV co-infection	26	13

*Per 100,000 population.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Priority areas of action to accelerate progress toward ending TB in these countries include ensuring political commitment and funding, addressing vulnerable and hard-to-reach populations (including migrants), improving LTBI management, emphasizing the prevention and management of multidrug-resistant TB (MDR-TB), strengthening epidemiological surveillance and program monitoring, implementing new diagnostic tools, and conducting research.

3 Laboratory diagnosis of TB

Laboratory diagnosis is an important aspect of the End TB Strategy. A well-structured, functional laboratory network capable of utilizing rapid diagnostic methods is a critical requirement for early, timely, and accurate detection of TB and drug resistance. The adoption of new TB diagnostic technologies requires adequate laboratory infrastructure, sufficient human resources, and appropriate country-level policy implementation to enable effective use in TB detection and diagnostic algorithms.

3.1 National policies

PAHO and WHO currently recommend the use of rapid tests for initial diagnosis in all people with signs or symptoms of TB. Sixteen out of 39 countries reported that they lacked an initial diagnosis policy for rapid testing and did not have an algorithm which included rapid testing. Six of these are countries with a high TB burden.

Universal access to drug susceptibility testing (DST) has also been recommended in recent years for all patients with a bacteriological diagnosis of TB. Eight countries have no policy in place to implement these tests, five of which have a high TB burden (see Annex 3).

3.2 Rapid diagnostic tests

In 2018, 84.8% of the new and relapse cases notified in the Region were of pulmonary TB; of these, 78.8% were bacteriologically confirmed, a figure similar to that of previous years. Initial diagnosis by rapid testing, as recommended by WHO, is still low in the Region (Figure 3.1). Although there was an increase in the number of countries reporting cases diagnosed by these methods (from 25 in 2017 to 31 in 2018), the percentage of TB cases thus diagnosed was only 18.2% in 2018. The number of TB cases diagnosed by rapid testing rose by 12,723 from 2017 to 2018; Bolivia (Plurinational State of), Brazil, and Haiti account for 81% of this increase (10,307 cases).

The second indicator of the laboratory strengthening plan recommended by the Global Laboratory Initiative (GLI) is the percentage of new and relapse TB cases initially diagnosed by rapid testing.

A well-structured, functional laboratory network with availability of rapid diagnostic methods is a critical requirement for early, timely, and accurate detection of TB and drug resistance.

Figure 3.1 New and relapse TB cases, according to location, bacteriological confirmation, and use of rapid tests for initial diagnosis, Region of the Americas, 2015-2018
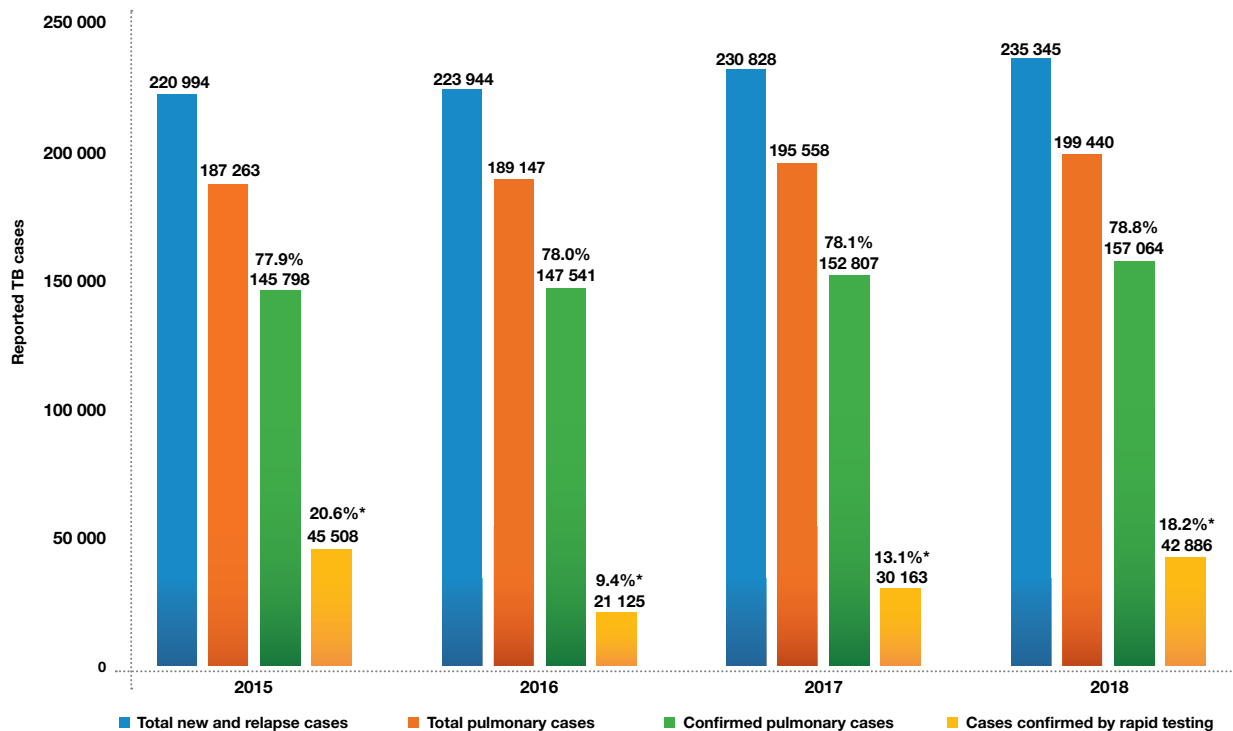
*Percentage of total notified new and relapse cases.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

3.3 Capacity and quality of TB diagnostic services

TB diagnostic capacity in the Region has grown, with an increase in the number of Xpert® MTB/RIF testing sites from 412 in 2017 to 491 in 2018 (Figure 3.2), but this has not translated into a significant increase in the percentage of notified cases initially diagnosed by rapid testing. Causes include low equipment productivity, associated with limited demand for these tests by medical personnel, difficulties in transporting samples, and indications for use only in vulnerable populations. Countries should accelerate the scaling-up of Xpert® MTB/RIF testing as a screening method for all people with signs or symptoms of TB.

With regard to the implementation of a quality management program for Xpert® MTB/RIF tests, 36% of sites in the Region had external quality control (EQC) in place, which represented a significant increase from 15% in 2017 (Figure 3.2). However, this is still a low percentage, as all test sites must participate in this process to ensure the quality of the reported results.

Figure 3.2. Number of sites performing Xpert® MTB/RIF testing, Region of the Americas, 2011-2018
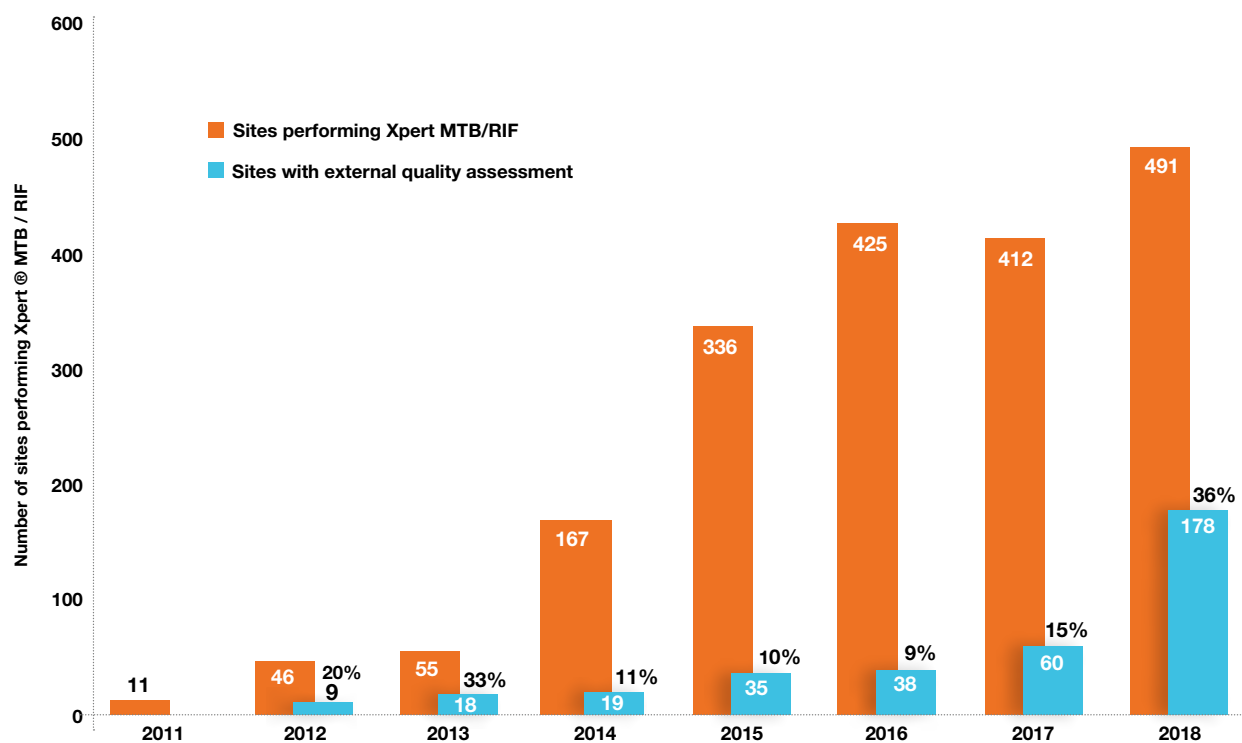
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In recent years, there has been an increase in sites performing sputum smear and culture, following a marked decline until 2016 (Figure 3.3 and 3.4). This installed capacity, as well as that for sputum cultures, should be maintained for bacteriological control of treatment and for cases which require determination of other resistance patterns in addition to those identified as RR-TB by Xpert® MTB/RIF tests.

Figure 3.3. Number of sites performing smear microscopy, Region of the Americas, 2011-2018
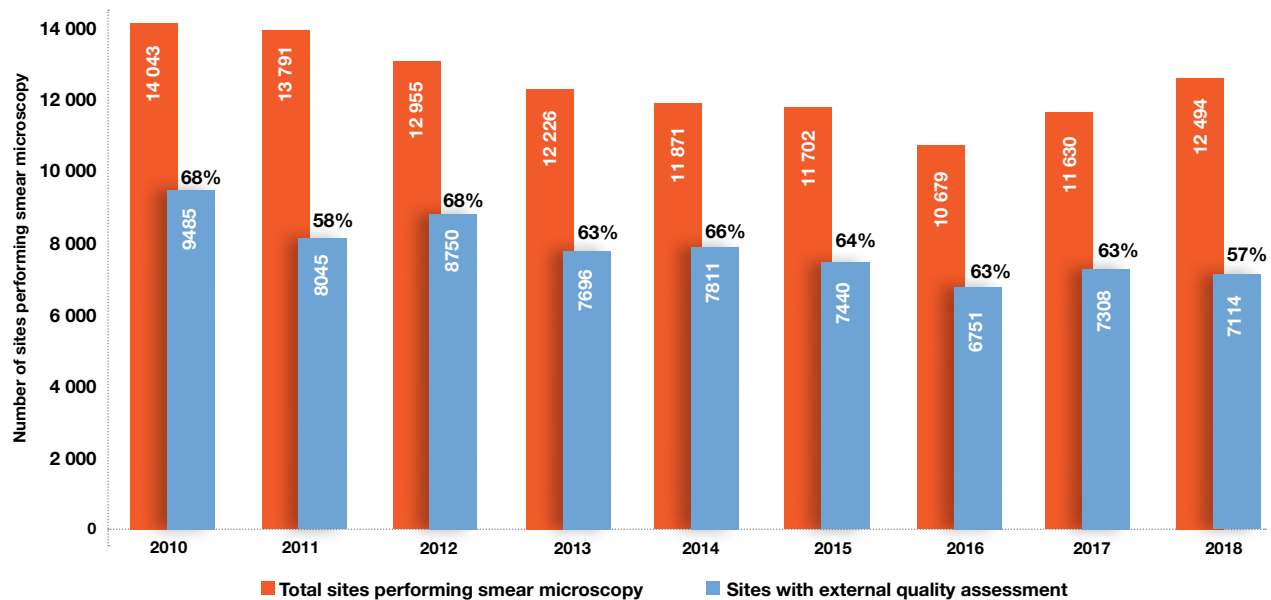
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Figure 3.4. Number of sites performing culture, Region of the Americas, 2011-2018

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Comparison of the number of sites offering first- and second-line DST in the Region between 2017 and 2018, shows a decline in all categories analyzed (Figure 3.5). With regard to phenotypic DST, Brazil reported 16 fewer sites in 2018 than in 2017, which accounts for the regional difference observed. Brazil, Guatemala, and Mexico reduced the number of sites conducting line probe assays (LPA) for isoniazid and rifampicin resistance. The decrease in number of sites performing LPA for second-line drugs was due to downsizing from six to two sites in Colombia between 2017 and 2018.

Figure 3.5. Number of sites offering first- and second-line drug susceptibility testing services, Region of the Americas, 2017-2018
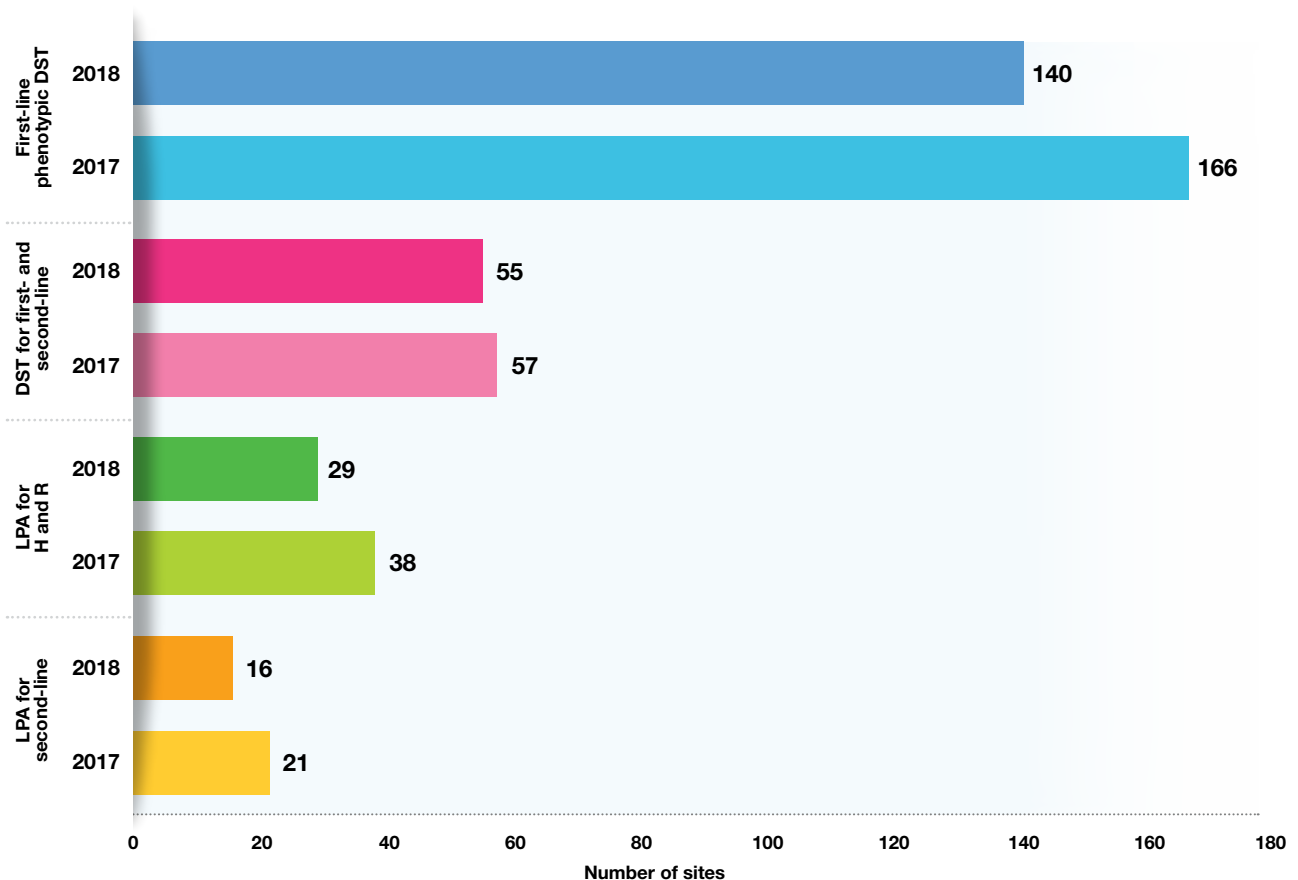
H: isoniazid; LPA: line probe assay; DST: drug susceptibility testing; R: rifampicin.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The quality control profile of the different diagnostic tests (sputum smear and culture, Xpert tests® MTB/RIF, DST, and LPA) in the countries was very heterogeneous, ranging from 0% to 100%. At the regional level, values from 36% to 89% were obtained for molecular testing (Xpert® MTB/RIF and LPA tests), versus 57% to 74% for sputum smear and DST, respectively (see Annex 2). To ensure quality of diagnosis, countries must work to incorporate all their tests into a quality management system with a view to accrediting laboratories under ISO 15189.

The *Framework of indicators and targets for laboratory strengthening under the End TB Strategy* serves as a guide for all countries to develop plans to strengthen their laboratories between 2016 and 2025.[9] Indicators measure the ability to detect TB accurately and quickly using new diagnostic methods. As a first step, countries should adopt policies that include diagnostic algorithms which mandate that a rapid test be used in the initial diagnosis of all people with signs or symptoms of TB. In addition, universal access to DST should be achieved for all patients with bacteriologically confirmed TB.

Annex 3 (Tables A3.1 and A3.2) summarizes the results of the main indicators for strengthening of TB laboratories in the countries of the Region.

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9   World Health Organization. Framework of indicators and targets for laboratory strengthening under the End TB Strategy. Geneva: WHO; 2016. Available from: https://www.who.int/tb/publications/labindicators/en/.

4 Tuberculosis preventive treatment

TB preventive treatment (TPT) is a critical intervention to achieve the global goals of the End TB Strategy. The high-risk groups prioritized for this intervention include children under 5 who are contacts of TB cases, as well as people with HIV, among others.

4.1 Tuberculosis preventive treatment in children

In 2018, only 10 countries reported the total number of contacts under age 5 who were traced and how many received TPT. Four more countries recorded information on children receiving TPT, but not the total number of contacts traced. Among countries with complete information, only 56% of contacts under the age of 5 received TPT (Figure 4.1).

Among all contacts traced, 493 cases of TB were detected in children under 5. If these cases are considered new diagnoses, the notified incidence rate in this particularly vulnerable group was 2,926 cases of TB per 100,000 contacts traced. This highlights the need to strengthen this intervention, which is essential for breaking the TB transmission chain, ensuring that new cases of TB are diagnosed and that the rest are given TPT.

Only 56% of contacts under the age of 5 were initiated on TB preventive treatment.

Figure 4.1. Child contacts under 5 years of age traced and started on TB preventive treatment, Region of the Americas, 2018*
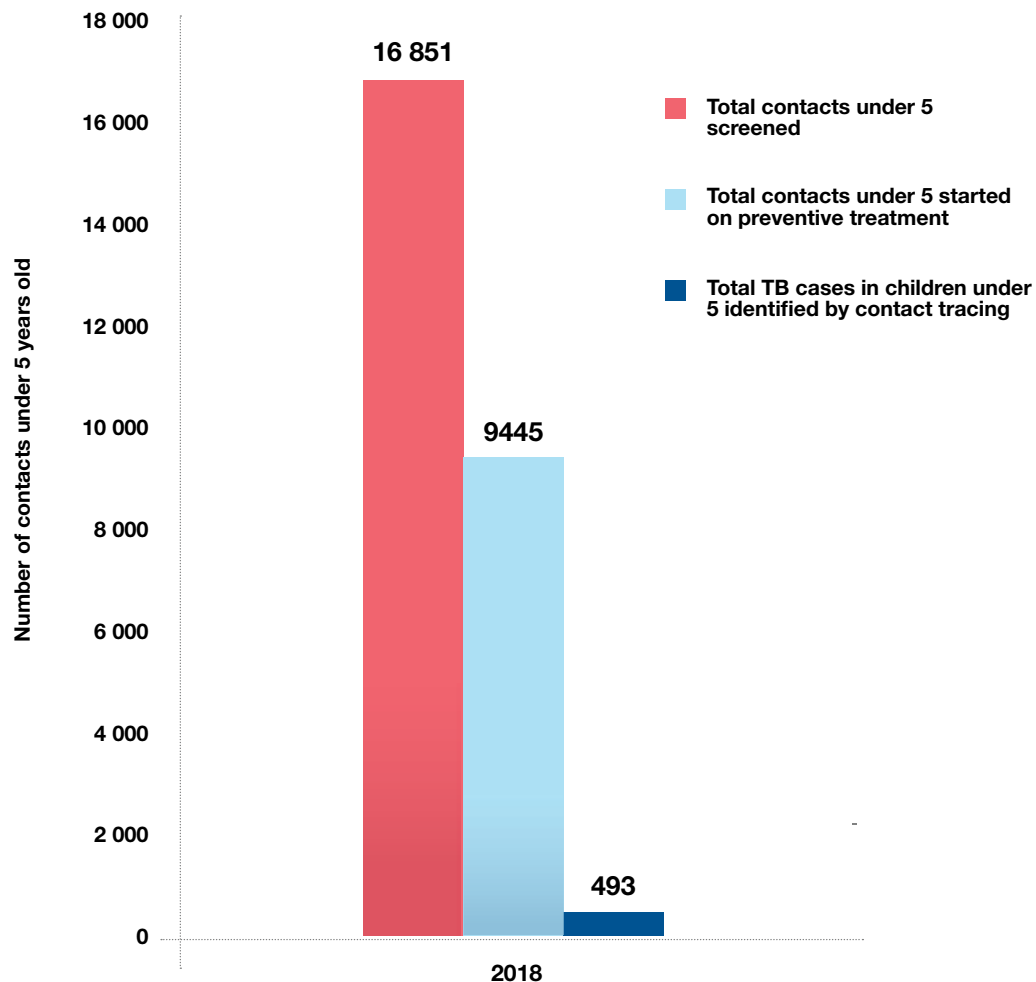
*10 countries for which information on contacts traced and started on TB preventive treatment is available were included.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

4.2 Tuberculosis preventive treatment in people living with HIV

People living with HIV must be systematically screened and treated for latent TB infection. The proportion of new HIV cases receiving TPT in the Region has varied over the years. Continuous information for the period 2015-2018 is available from 13 countries in the Region.[10] As shown in Figure 4.2, the number of people newly enrolled in HIV care has increased. However, the number of people started on TPT has not followed this increase; instead, the percentage of people registered for TPT in this group of countries has declined.

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10 Barbados, Colombia, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Paraguay and Peru.

Figure 4.2. Tuberculosis preventive treatment in people with HIV infection, selected countries in the Region of the Americas*, 2015-2018
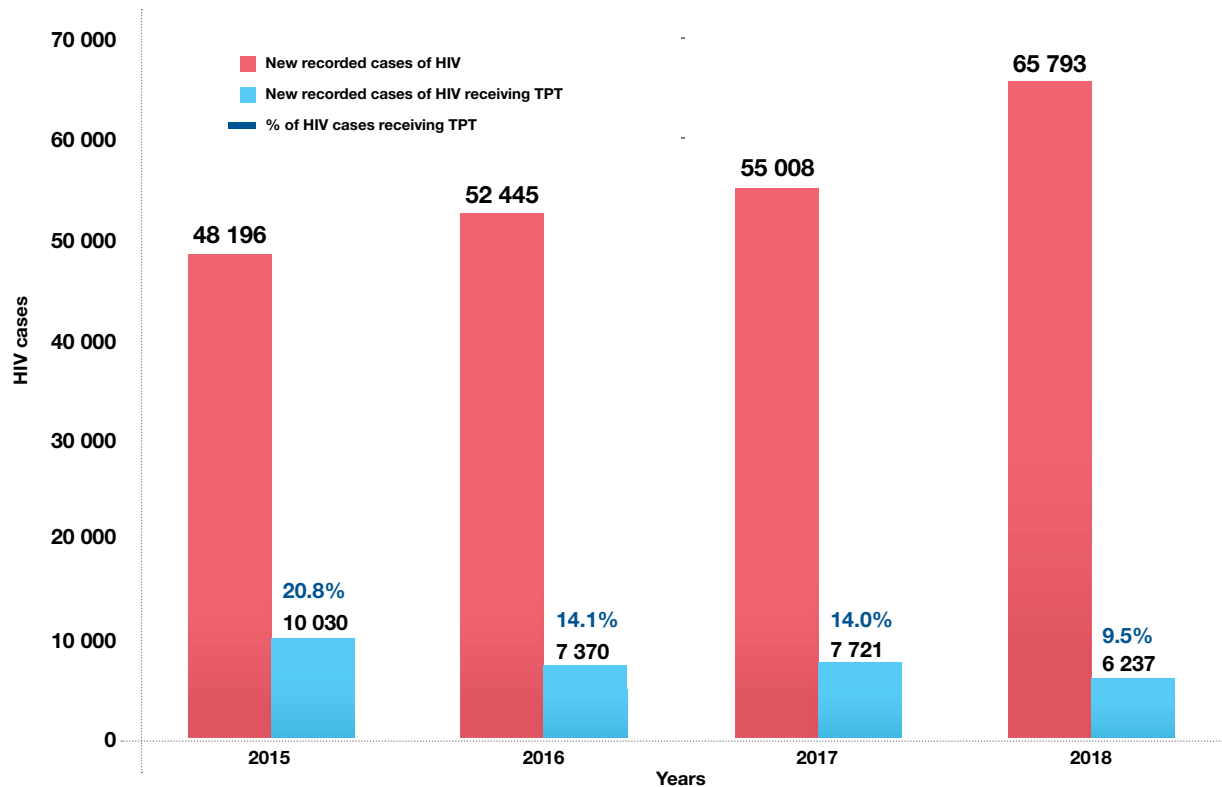
*Data from 13 countries from which continuous information for the period 2015-2018 was available.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The number of countries reporting this indicator in 2018 increased to 20. The average proportion of cases first enrolled in HIV care who were started on TPT in these countries was 9.3%, ranging from 74.3% in Cuba to 0.9% in Colombia. Three countries kept no record of people living with HIV who were started on TPT (Table 4.1).

When analyzing this indicator, it should be noted that TPT coverage data in people living with HIV depends on the national LTBI policy, which may vary from administering TPT to all people living with HIV to initiating TPT only in those diagnosed with LTBI by tuberculin skin testing or interferon gamma release assay. This indicator includes in the denominator all people living with HIV newly enrolled in HIV care in the country, regardless of whether they are eligible for TPT on the basis of national recommendations.

The average proportion of cases newly enrolled in HIV care who were started on TPT in 20 countries reporting this indicator was 9.3%.

Table 4.1. Persons newly enrolled in HIV care and who started TB preventive treatment, Region of the Americas*, 2018

Country	Total number of people living with HIV on TB preventive treatment	Number of people newly enrolled in HIV care	Percentage (%)
Cuba	1 778	2 393	74.3
Peru	1 094	12 100	9.0
Honduras	730	1 265	57.7
Panama	637	2 434	26.2
Dominican Republic	542	1 912	28.3
El Salvador	435	597	72.9
Guatemala	380	3 548	10.7
Chile	294	6 409	4.6
Nicaragua	290	937	30.9
Mexico	242	23 907	1.0
Guyana	236	554	42.6
Paraguay	211	1 545	13.7
Ecuador	187	3 925	4.8
Uruguay	125	1 100	11.4
Colombia	112	12 985	0.9
Venezuela (Bolivarian Republic of)	94	4 012	2.3
Antigua and Barbuda	4	48	8.3
Barbados	0	125	0.0
Saint Lucia	0	24	0.0
Grenada	0	20	0.0
Total	7 391	79 840	9.3

*Countries for which information is available.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from:
https://www.who.int/tb/publications/global_report/en/.

These two TPT coverage indicators – in people living with HIV and in child contacts under 5 years of age –, as well as the contact tracing coverage indicator, are among the 10 priority indicators of the End TB Strategy, which have an expected target level of 90% or greater. However, as shown, not all countries provide information on these indicators or fail to provide information on a continuous basis, thus preventing analysis of the true situation in the Region.

Achieving the proposed targets of the End TB Strategy and the commitments of the United Nations General Assembly high-level meeting on TB with respect to TPT requires accelerating and strengthening the implementation and monitoring of these key preventive activities. In addition, these interventions should be extended to other high-risk groups, such as household contacts over the age of 5, people being treated with tumor necrosis factor-alpha inhibitors, people on dialysis, people waitlisted for organ transplantation, people with silicosis, health personnel, persons deprived of liberty (PDL), unhoused persons, and those with substance use disorders, among others.

The use of shorter schemes for the treatment of LTBI, as recommended by WHO, can facilitate scaling-up and adherence to preventive treatment.

5 Treatment outcomes in drug-susceptible TB

Regular, full-course treatment of drug-susceptible TB not only cures the patient but reduces disease transmission in the community and prevents the development of resistance to anti-TB drugs. For treatment to be effective, it must be started as soon as possible after diagnosis and followed until completion. Treatment is expected to be successful in 90% of patients or more. This percentage is one of the main indicators of the End TB Strategy.

Figure 5.1 summarizes the treatment outcomes of notified cases based on history of treatment, TB/HIV co-infection, age (under 15 years), and drug resistance. The highest rate of treatment success was observed in children under 15 years of age (77%), while the lowest (47.6%) was observed in retreatment cases. These findings are discussed later in this report.

Figure 5.1. Outcome of TB treatment in selected cohorts, Region of the Americas, 2016* and 2017**

	New and relapse	Retreatment	TB/HIV	Under age 15	MDR-TB	XDR-TB
■ Not evaluated	8.4	13.9	10.4	14.3	4.4	1.7
■ Lost to follow-up	8.5	29.4	13.2	5.9	25.2	13.3
■ Died	7.0	8.4	19.6	2.8	8.1	15.0
■ Failure	0.4	0.7	0.4	0.1	3.1	8.3
□ Treatment success	75.6	47.6	56.4	77.0	59.1	61.7

*MDR-TB and XDR-TB cases.
**New and relapse cases, retreatment, TB/HIV co-infection, and children under 15.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from:
https://www.who.int/tb/publications/global_report/en/.

5.1 Treatment outcomes for new and relapse cases

In 2017, 226,231 new and relapse cases were notified in the Region of the Americas, 76% of which were successfully treated. This percentage has remained close to 75% in the last four years evaluated.

However, mortality still exceeds 6% in all groups of disease-burdened countries, even though TB is a preventable and curable disease (Figure 5.2). The countries with the highest TB burden had the lowest success rate when compared to low-incidence countries and the rest of the Region. Loss to follow-up in intermediate- and high-burden countries exceeds 7%. There is also a striking proportion of cases classified as "not evaluated" in relation to treatment outcome in low-incidence countries (14.2%), largely due to cases notified by the United States.

These results reflect programmatic difficulties in the comprehensive approach to patients with drug-susceptible TB. Country-level analyses are required to identify and address the factors that affect these outcomes, so as to improve the quality of care and ensure the achievement of set targets.

Figure 5.2. Treatment outcomes for notified new and relapse TB cases, stratified by country TB burden, Region of the Americas, 2017
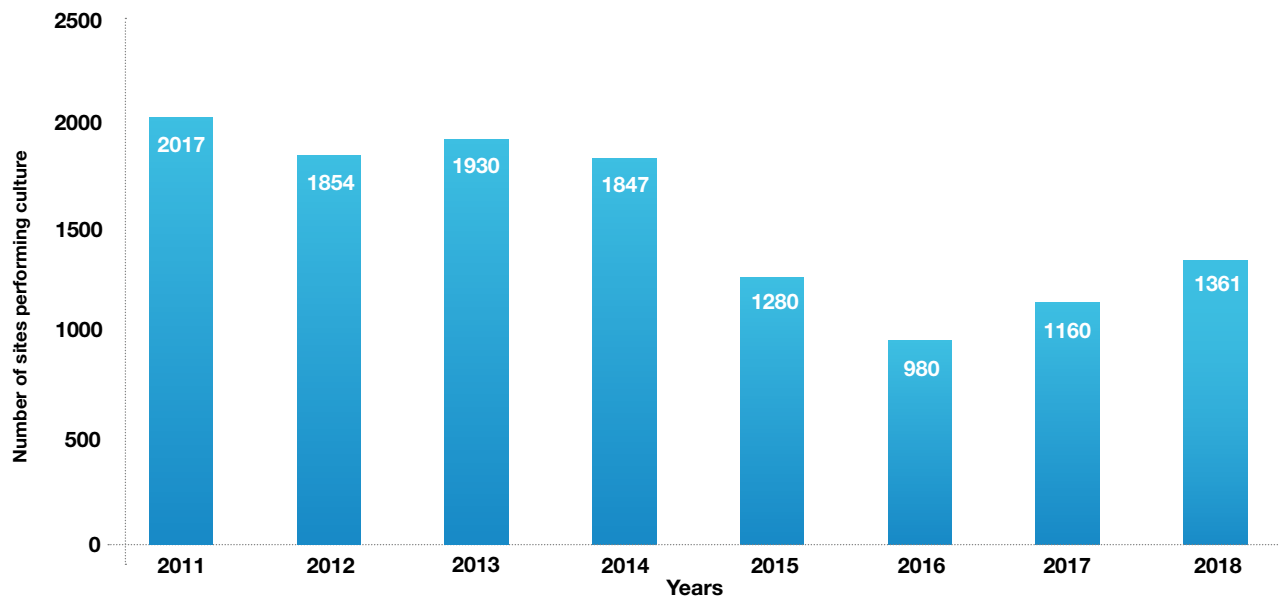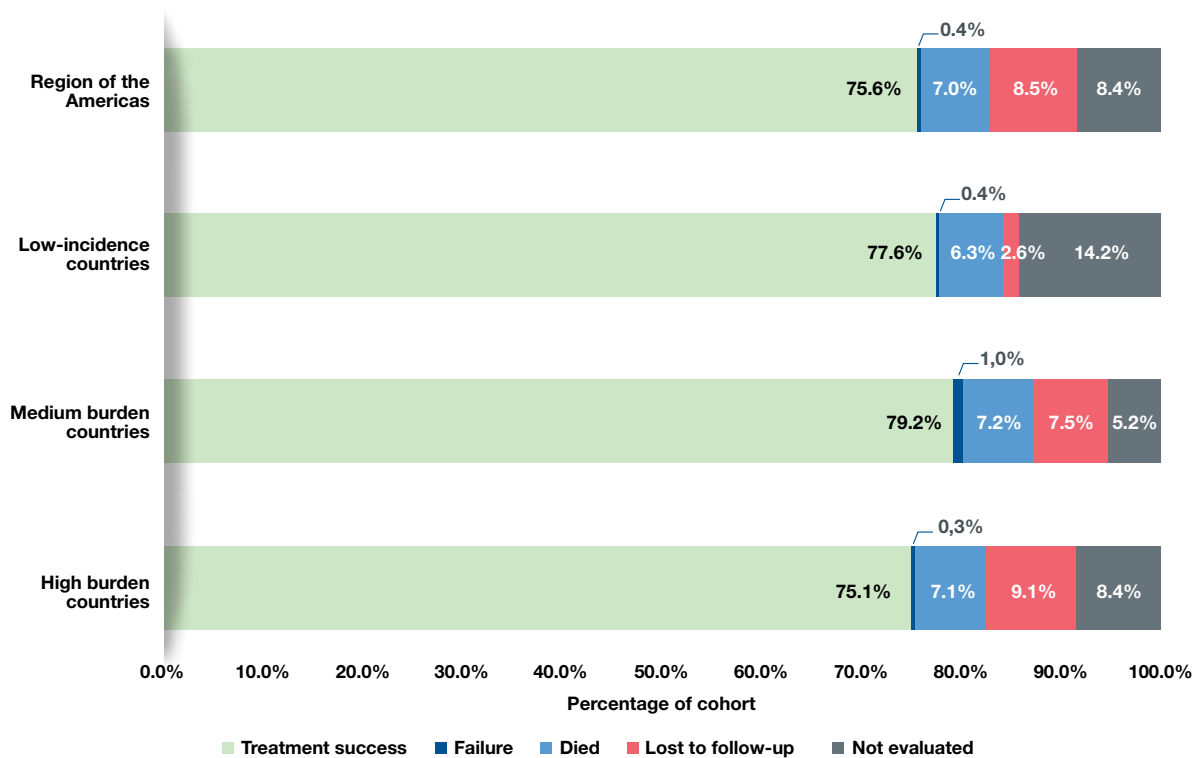

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The treatment success rate for new and relapse cases remained close to 75% in the last 4 years.

5.2 Treatment outcomes for previously treated cases

Treatment outcomes in patients with previously treated TB were less favorable when compared to new and relapse cases. In the last four years, the success rate was approximately 50% in this group. It is worth noting that loss to follow-up was three times higher than among new and relapse cases, which is indicative of irregular treatment courses with an increased risk of emergence of resistant strains.

For previously treated cases, the difference in treatment outcomes is highly dependent on country disease burden. Although still low, the treatment success rate is much higher in low-incidence countries. In high TB burden countries, the success rate is much lower, while loss of follow-up is almost three times more frequent than in low-incidence countries (Figure 5.3). In all groups, the proportion of deaths is over 7.4%, and 12.3% of cases are listed as "not evaluated" with regard to outcome.

As with new and relapse cases, a detailed, country-level analysis is required in order to effectively address the factors affecting these outcomes.

Figure 5.3. Treatment outcomes for notified previously treated TB cases, stratified by country TB burden, Region of the Americas, 2017
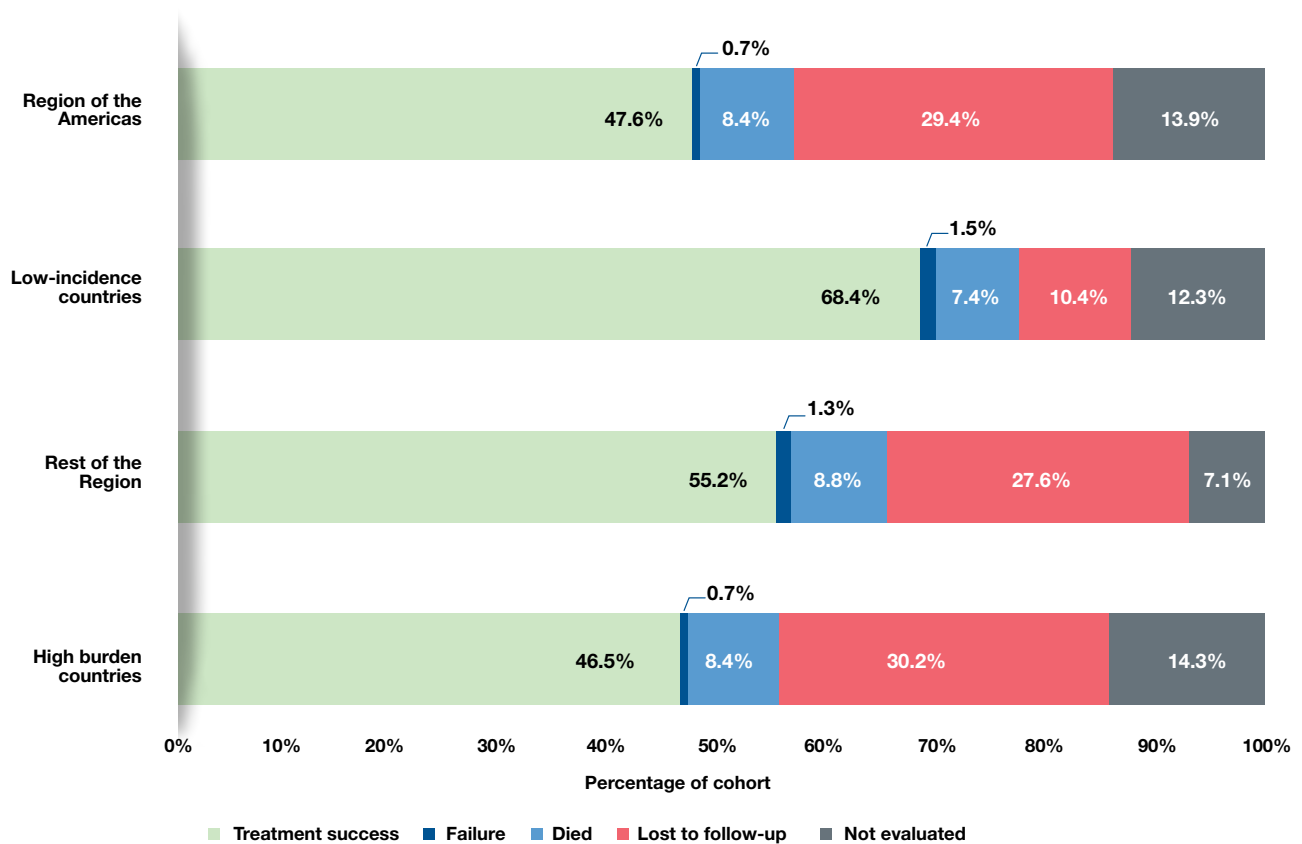
6 Drug-resistant tuberculosis

Within the multitude of public health issues posed by TB, drug resistance is a threat to the control and ultimate elimination of TB worldwide.

Proper and timely diagnosis of drug resistance in TB requires universal access to DST. These should be offered primarily to people at risk of resistant TB (people living with HIV, patients previously treated for TB, children, and health personnel, among others), and tests for first- and second-line drugs should be available in order to diagnose the type of resistance and guide subsequent treatment.

In the Region of the Americas, DST coverage in 2018 remained unchanged from the previous four years, both for new and previously treated cases. It is still far from the proposed target of 100% of bacteriologically confirmed TB cases (Figure 6.1).

It is estimated that, in 2018, 2.5% of new cases and 12% of previously treated cases across the Region were rifampicin-resistant. Also in 2018, 11,000 incident cases of rifampicin-resistant TB (RR-TB) are estimated to have occurred, of which 8.800 (83%) would be resistant to both rifampicin and isoniazid, and thus characterized as multidrug-resistant (MDR-TB).

Only 43.5% of estimated cases of MDR-TB were detected in 2018 (4,791 in total) and, while there has been an increase in notified cases in recent years due to the introduction and expansion of rapid diagnostic methods, a large gap remains in relation to estimated cases (6,000 cases for 2017 and 2018; Figure 6.2).

Drug susceptibility coverage in 2018 remained unchanged from the previous four years, both for new and previously treated cases. Only 43.5% of estimated RR/MDR-TB (4,791) cases were detected.

Figure 6.1 Drug susceptibility tests performed on new and previously treated TB cases, Region of the Americas, 2013-2018
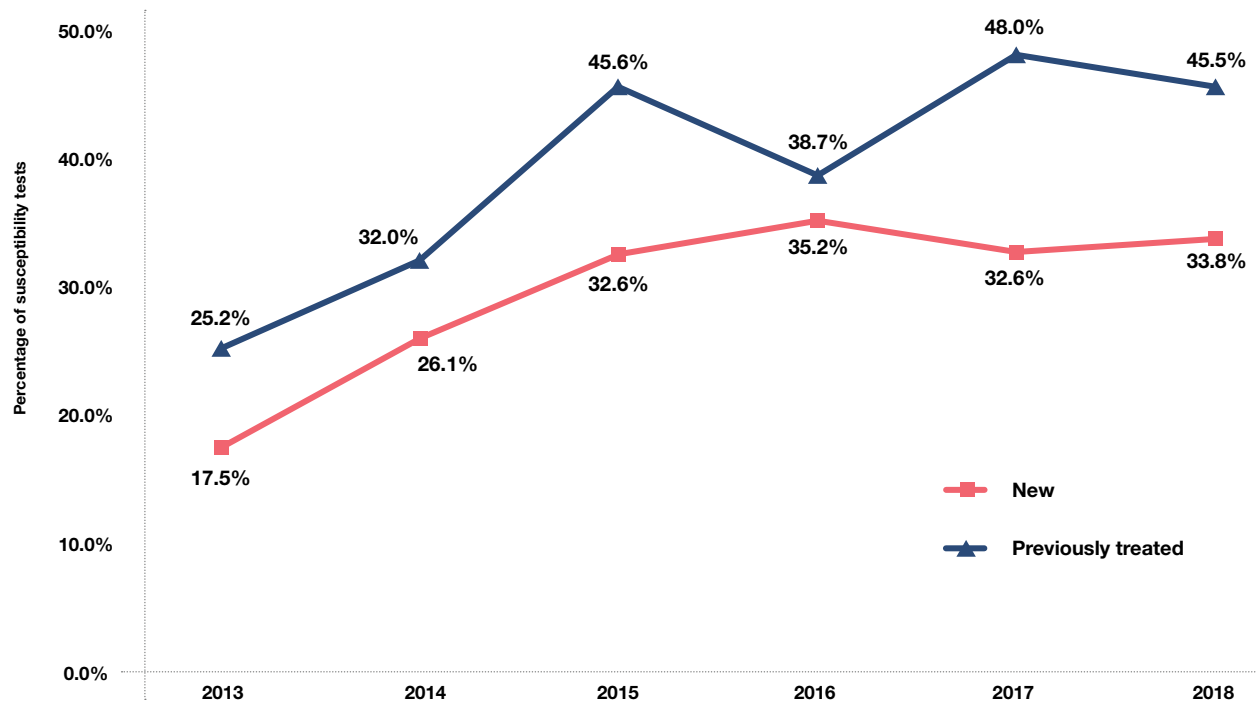
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Figure 6.2. Estimated and notified cases of rifampicin-resistant or multidrug-resistant tuberculosis (RR/MDR-TB), Region of the Americas, 2016-2018
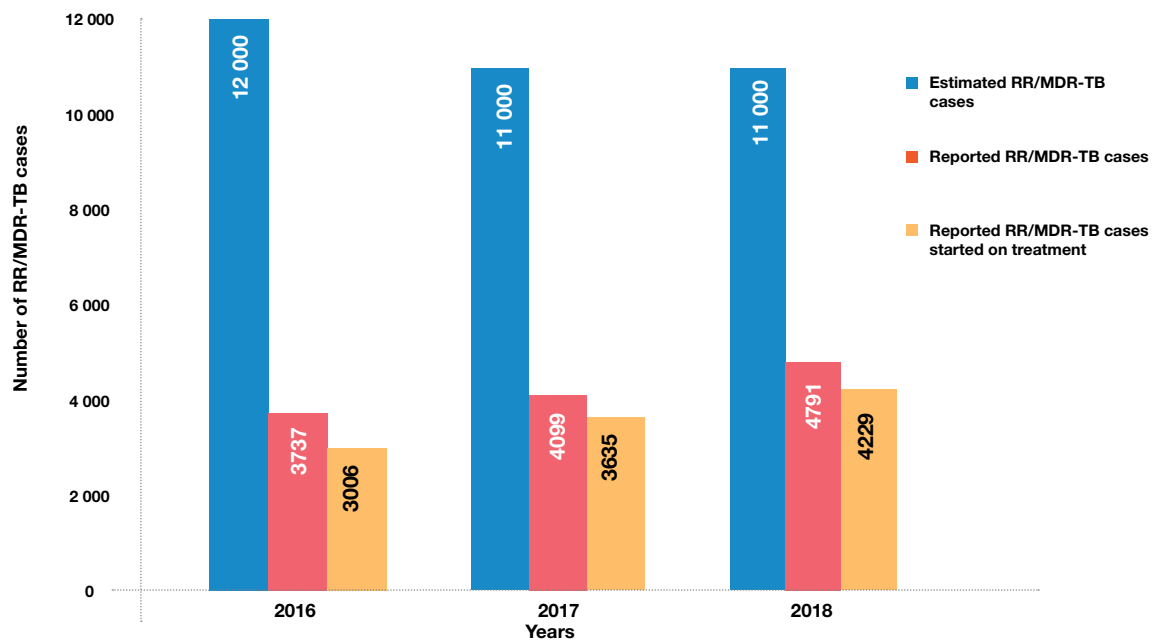
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Of the total confirmed cases of MDR-TB notified in 2018, 88.3% started treatment, a percentage similar to 2017 (89%). Of those countries reporting more than 10 cases of MDR-TB in 2018, only two had treatment coverage below 80%: Brazil (62.8%) and Nicaragua (71.1%).

Ten countries accounted for 86.7% of all estimated RR/MDR-TB cases in the Region in 2018; Brazil and Peru alone accounted for 50% (Table 6.1). Strengthening effective interventions to address drug resistance in these two countries is crucial to halting the progress of MDR-TB in the Region.

Table 6.1. Countries with the highest number of estimated cases of rifampicin-resistant or multidrug-resistant TB, Region of the Americas, 2018

Country	Estimated cases of RR/MDR-TB		
	Number	**Percentage***	**Rate****
Peru	3 200	29.1	10.0
Brazil	2 500	22.7	1.2
Mexico	950	8.6	0.8
Colombia	580	5.3	1.2
Haiti	570	5.2	5.1
Argentina	560	5.1	1.3
Venezuela (Bolivarian Republic of)	400	3.6	1.4
Bolivia (Plurinational State of)	350	3.2	3.1
Dominican Republic	230	2.1	2.2
Ecuador	220	2.0	1.3
Total, high RR/MDR-TB burden	**9 560**	**86.9**	**1.8**
Rest of Region	**1 440**	**13.1**	**0.3**
Region of the Americas	**11 000**	**100.0**	**1.1**

*As percentage of total estimated cases of RR/MDR-TB.
**Per 100,000 population.
RR-TB: rifampicin-resistant tuberculosis; MDR-TB: multidrug-resistant tuberculosis.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Of the confirmed RR/MDR-TB cases reported in 2018, 88.3% started treatment.

The estimated rate of resistant cases in this group of 10 countries was six times higher than in the rest of the Region. The behavior of RR/MDR-TB case reporting rates shows an upward trend, driven by countries with a high resistant TB burden (Figure 6.3). These, in turn, are the countries with the highest TB load overall.

Figure 6.3. **Trend in notified incidence rate of RR/MDR-TB, Region of the Americas, 2014-2018**

Drug-resistant TB in children under 15 years of age can be considered an indicator of primary resistance. Between 2016 and 2018, the number of notified cases of MDR-TB in children nearly doubled from 43 to 70, accounting for 2% of all cases of MDR-TB notified in the Region in 2018. This increase was mainly due to the inclusion of children as priority groups for Xpert® MTB/RIF testing as the initial diagnosis of TB.

All patients with RR/MDR-TB should be assessed for resistance to fluoroquinolones and injectable second-line drugs with the aim of diagnosing extensively drug-resistant TB (XDR-TB). In 2018, 44.5% of cases of MDR-TB (n=2.130) underwent second-line DST. This percentage has remained stable in recent years, at an average of 45% (Figure 6.4). One of the main reasons for this situation is the slow implementation of rapid molecular testing for the detection of second-line drug resistance by laboratories in the Region.

Figure 6.4. **RR/MDR-TB cases notified and tested for second-line drug resistance, Region of the Americas, 2015-2018**

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Of all cases of MDR-TB, 44.5% (n=2,130) underwent second-line drug susceptibility testing.

In recent years, there has been a growing trend in reporting of XDR-TB cases. Twice as many cases were notified in 2018 as in 2011 (Figure 6.5). A determining factor in this increase is the implementation and expansion of second-line DST in the Region.

Figure 6.5. Trend in reported XDR-TB cases, Region of the Americas, 2011-2018

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In 2018, 13 countries notified a total of 150 cases of XDR-TB; 82% of these occurred in two countries, Peru and Brazil (Figure 6.6). This highlights the need to intensify prevention and control activities in these countries.

Figure 6.6. Countries notifying XDR-TB cases, Region of the Americas, 2018
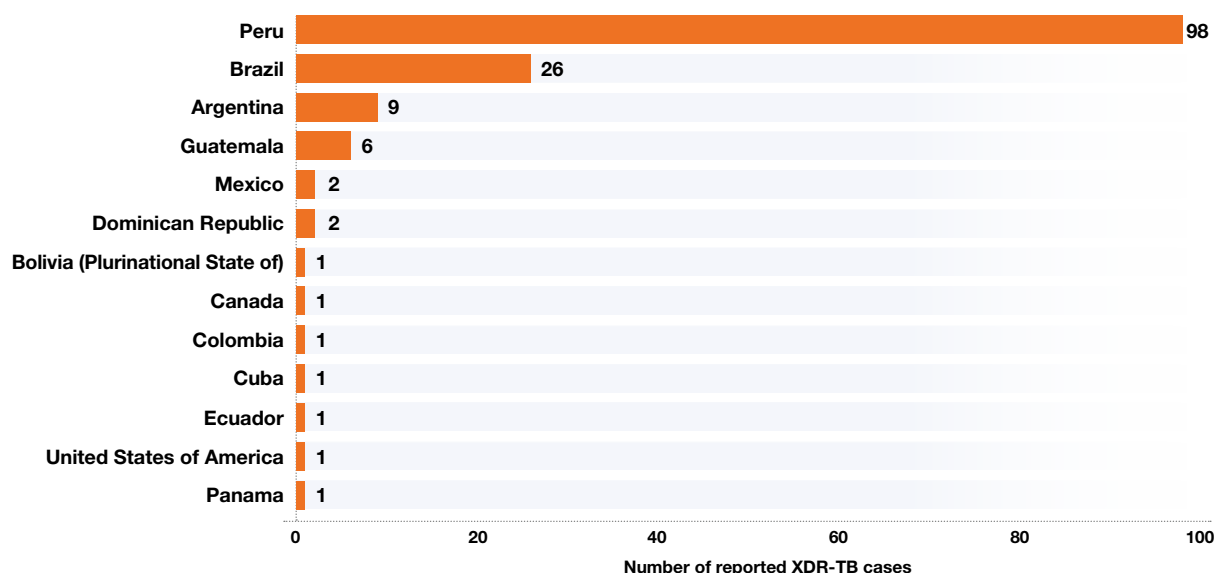
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In 2018, information on the use of new medicines for drug-resistant TB (bedaquiline and delamanid) was available from nine countries. Bedaquiline was used in 160 patients in six countries in 2017, increasing to 189 patients in nine countries in 2018. Delamanid use did not increase; 17 patients received it in 2017 and 18 in 2018, respectively (Table 6.2).

Table 6.2   Number of patients initiated on treatment of drug-resistant TB with bedaquiline and delamanid, Region of the Americas, 2017-2018

Country	Bedaquiline		Delamanid	
	2017	2018	2017	2018
Peru	102	150	4	5
Haiti	16	17	8	8
Dominican Republic	6	10	2	1
Brazil	20	8		
Argentina		1		
Chile		1		1
Guatemala		1		
Mexico	1	1	2	1
United States of America	15		1	2
Region of the Americas	**160**	**189**	**17**	**18**

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

6.1 Treatment outcomes for cases of rifampicin-resistant, multidrug-resistant, and extensively drug-resistant tuberculosis

In 2016, of 2,666 patients with RR/MDR-TB, 59% were successfully treated; among cases of XDR-TB, the treatment success rate was higher, reaching 62%.

The treatment success rate among patients with MDR-TB and XDR-TB in the Americas has increased in recent years. This is largely due to better access to second-line DST (Figure 6.7). Nevertheless, loss to follow-up among people with MDR-TB and deaths from XDR-TB remain high. The percentage of treatment failures and cases in which treatment outcome was not evaluated has decreased among cases of MDR-TB and XDR-TB alike, largely due to effective interventions implemented in Peru.

Figure 6.7 **Treatment outcomes for notified cases of RR/MDR-TB and XDR-TB, Region of the Americas, 2014-2016**

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

7 TB/HIV co-infection

TB often occurs in people with HIV, and it is the leading cause of death in this group.

In 2018, an estimated 29,000 incident cases of TB occurred in people living with HIV in the Region, representing a rate of 2.9 cases of TB/HIV co-infection per 100,000 population. Since 2012, this rate has been trending down, with an average annual reduction of 3.3%.

Seventy percent of estimated TB/HIV co-infection cases occurred in five countries in the Region: Brazil (11,000), Haiti (2,900), Mexico (2,800), Peru (2,400), and Colombia (2,100). However, the highest estimated proportion of TB/HIV co-infection was recorded in the Caribbean countries (Figure 7.1), where the HIV epidemic has been proportionately larger than in the rest of the Region and where TB is most commonly due to underlying HIV.

Figure 7.1. Estimated percentage of people with TB/HIV co-infection in selected countries, Region of the Americas, 2018

Country	Percentage with TB/HIV coinfection
Belize	33.6
Dominican Republic	25.0
Jamaica	23.3
Bahamas	22.2
Guyana	18.8
Panama	18.2
St. Lucia	16.7
Uruguay	15.8
Trinidad and Tobago	15.2
Suriname	14.5
Haiti	14.5
Puerto Rico	13.8
Ecuador	13.5
Colombia	13.1
Brazil	11.6
Cuba	11.0
Costa Rica	10.8
Chile	10.6
Region of the Americas	10.1
Mexico	9.7
Paraguay	8.7
Venezuela (Bolivarian Republic of)	8.6
Argentina	6.9
Guatemala	6.9
Honduras	6.6
Peru	6.2
El Salvador	5.8
Nicaragua	5.4
United States of America	5.1
Bolivia (Plurinational State of)	4.5
Canada	4.1

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Of the estimated 29,000 cases of TB/HIV co-infection in the Americas in 2018, 19,885 were notified, representing a gap of some 9,000 cases – down 500 cases from the year before. Between 2010 and 2018, there was a 2.9% annual decline in the notification rate of TB/HIV cases (see Figure 2.6).

In 2018, 82.2% of notified new and relapse TB cases had an HIV test result. This percentage increased substantially from 2005 to 2015 (142%), but it has remained stable over the past 4 years. Most countries had HIV test coverage above the regional average. Only five (Argentina, Brazil, Canada, Jamaica, and the Bolivarian Republic of Venezuela) notified coverage below 80% (Figure 7.2). All countries must ramp up their efforts to reach the 100% target set by the End TB Strategy.

Figure 7.2 **Proportion of notified TB cases with documented HIV status, Region of the Americas, 2018**

Country	Percentage
Cuba	100.0%
Guatemala	99.3%
El Salvador	99.1%
Panama	99.0%
Honduras	98.1%
Trinidad and Tobago	96.8%
Suriname	96.6%
Belize	96.0%
Bahamas	95.7%
Uruguay	94.8%
Costa Rica	94.5%
Peru	93.8%
Nicaragua	93.7%
Haiti	92.3%
Puerto Rico	92.0%
Colombia	91.3%
Mexico	89.0%
Guyana	87.4%
United States of America	87.2%
Dominican Republic	86.2%
Bolivia (Plurinational State of)	86.0%
Paraguay	86.0%
Chile	85.1%
Ecuador	82.6%
Region of the Americas	82.6%
Brazil	78.9%
Canada	66.9%
Jamaica	63.8%
Venezuela (Bolivarian Republic of)	58.0%
Argentina	25.5%

TB cases with known HIV status

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In 2018, 10.3% of patients with TB and for whom an HIV test result was available were co-infected. The co-infection rate ranged from 25.1% in the Dominican Republic to 4.4% in the Plurinational State of Bolivia. Both countries have a high percentage of HIV testing in TB patients. Argentina also had a high co-infection rate (25.5%), but with HIV test coverage of just 25% in TB patients.

In 2018, the proportion of detected versus estimated TB/HIV co-infections (69%) and the percentage of detected cases started on antiretroviral therapy (61%) remained unchanged from the previous 3 years (Figure 7.3). This poses a challenge to reaching the End TB Strategy target of 100% antiretroviral therapy coverage in people with TB/HIV co-infection. Countries should conduct a detailed analysis to identify and address the factors that determine these outcomes.

Figure 7.3. Cascade of TB/HIV care, Region of the Americas, 2015-2018

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In 2018, the proportion of detected versus estimated TB/HIV co-infection cases (69%) and the percentage of detected cases started on antiretroviral therapy (61%) remained unchanged from the previous three years.

Treatment outcomes of cases of TB/HIV co-infection

Treatment outcomes in people with TB/HIV co-infection in 2017 were less favorable than in new and relapse or drug-resistant TB cases, and this situation has not improved in recent years. The treatment success rate in people with this co-infection was 56.4%, while for new and relapse TB cases it was 75.6%, and for MDR-TB and XDR-TB, 59.1% and 61.7% respectively (Figure 5.1). Co-infected patients also have a strikingly high mortality rate––close to 20%––that is triple the rate observed in new and relapse cases of TB (7%). In low-incidence countries, the treatment success rate in co-infected people was higher than elsewhere in the Region, while in high-burden countries and the rest of the Region, the success rate was lower and similar to the regional average (Figure 7.4).

Figure 7.4. **Treatment outcomes for notified TB/HIV co-infection cases, stratified by country TB burden, Region of the Americas, 2017**
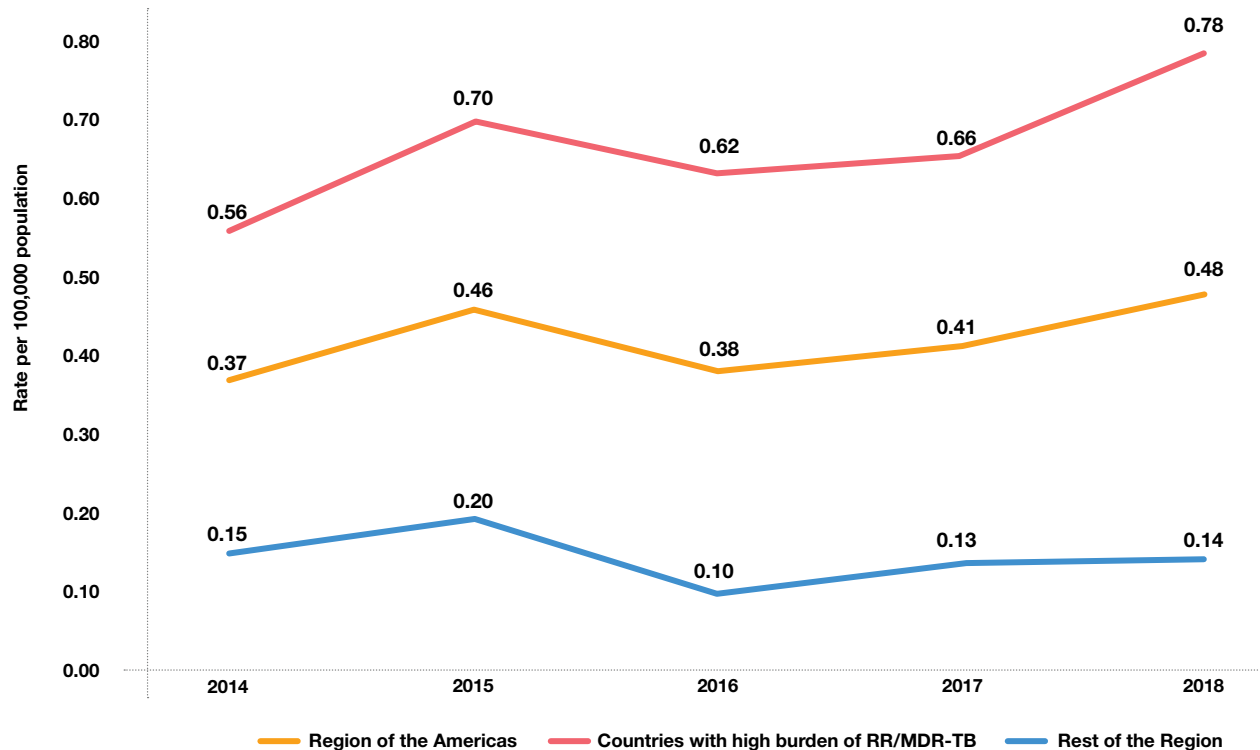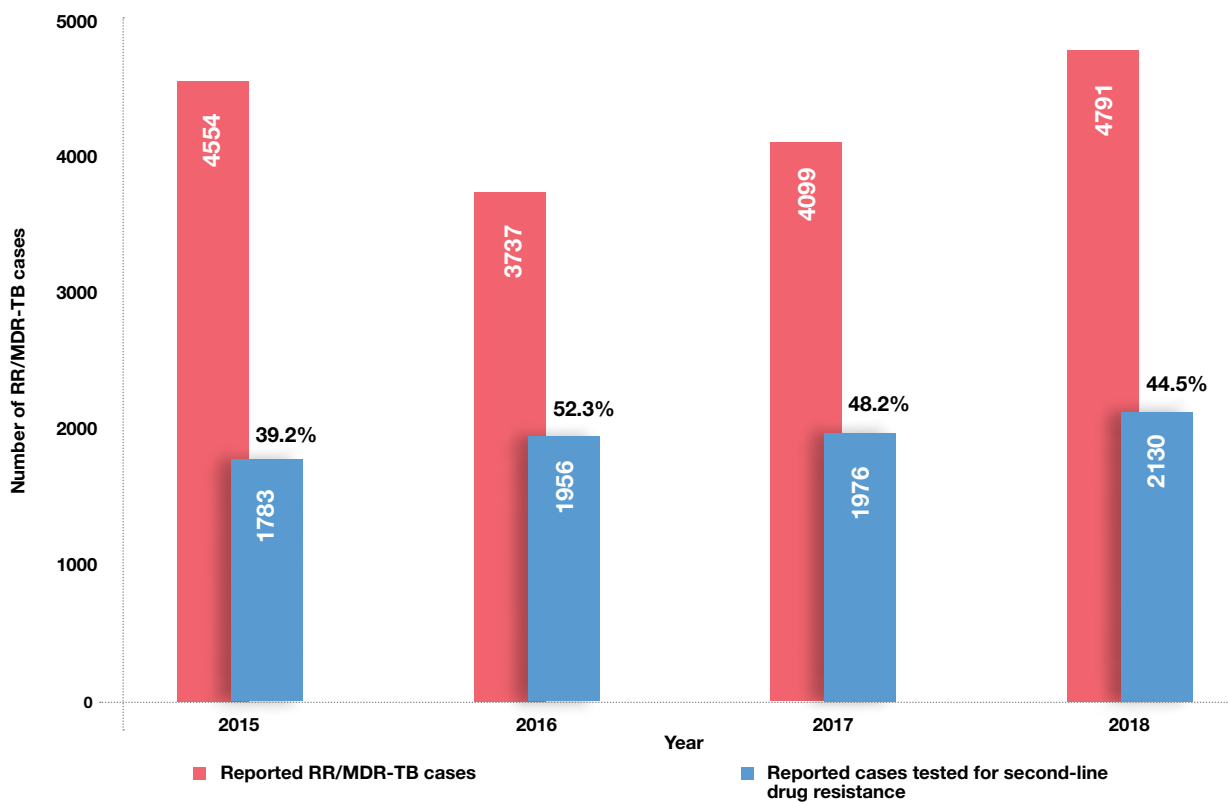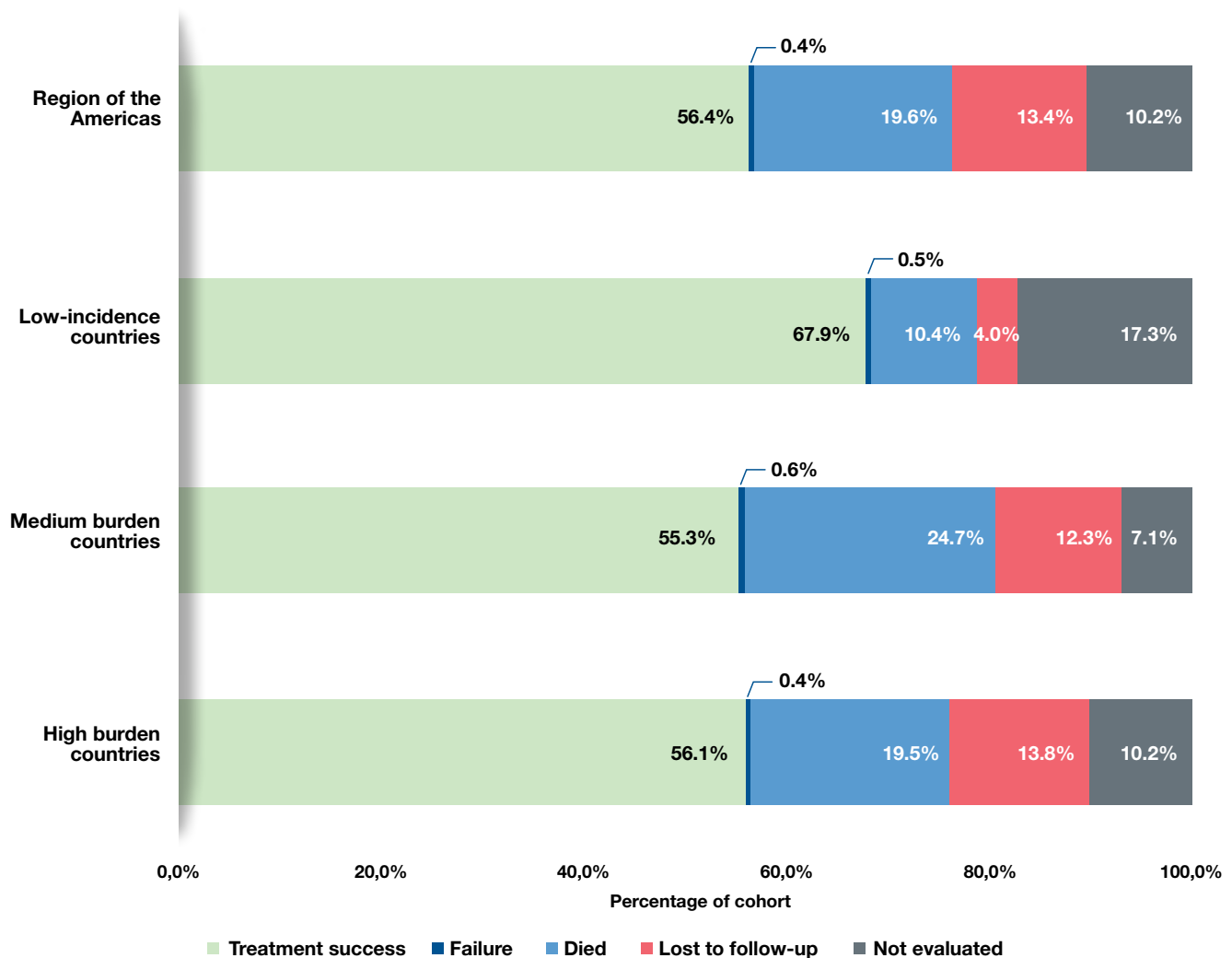

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Late diagnosis of HIV infection, lack of screening and timely diagnosis of TB in people living with HIV, failure to initiate antiretroviral therapy and conduct TPT in people living with HIV, and the double burden of stigma and discrimination are some of the factors influencing and leading to unfavorable outcomes, such as death and loss to follow-up, in co-infected patients.

To address TB/HIV co-infection, collaborative activities should be implemented and strengthened to ensure that TB and HIV programs work together to reduce the burden of TB in people living with HIV and the burden of HIV in people with TB.

8 Risk factors and vulnerable groups for TB

The number of people infected with TB who end up developing the disease is greatly influenced by socioeconomic determinants and health-related risk factors, such as HIV co-infection, diabetes, tobacco use, alcohol use, and malnutrition, among others.

WHO has estimated the number of TB cases attributable to five health-related risk factors associated with TB, including malnutrition, alcohol, HIV, tobacco use, and diabetes (Figure 8.1).[11] In the Region, 46% of new (estimated) TB cases are attributable to one or more of these risk factors.

There is substantial variation within and among countries regarding the extent to which each of these five risk factors contributes to TB. Therefore, each country must define, according to its situation, which of these factors should be prioritized as part of national efforts to reduce the burden of TB. This should be accompanied by interventions targeting the broader determinants of TB infection and disease, such as poverty, housing quality, and lifestyle factors.

In the Region of the Americas, 46% of estimated new TB cases are attributable to one of the following risk factors: malnutrition, alcohol, HIV, tobacco use, and diabetes.

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11 World Health Organization. Estimated incidence of TB disaggregated by age, sex, and risk factors. Available from: https://www.who.int/tb/country/data/download/en/.

Figure 8.1. Number and proportion of estimated TB cases associated with risk factors, Region of the Americas, 2018
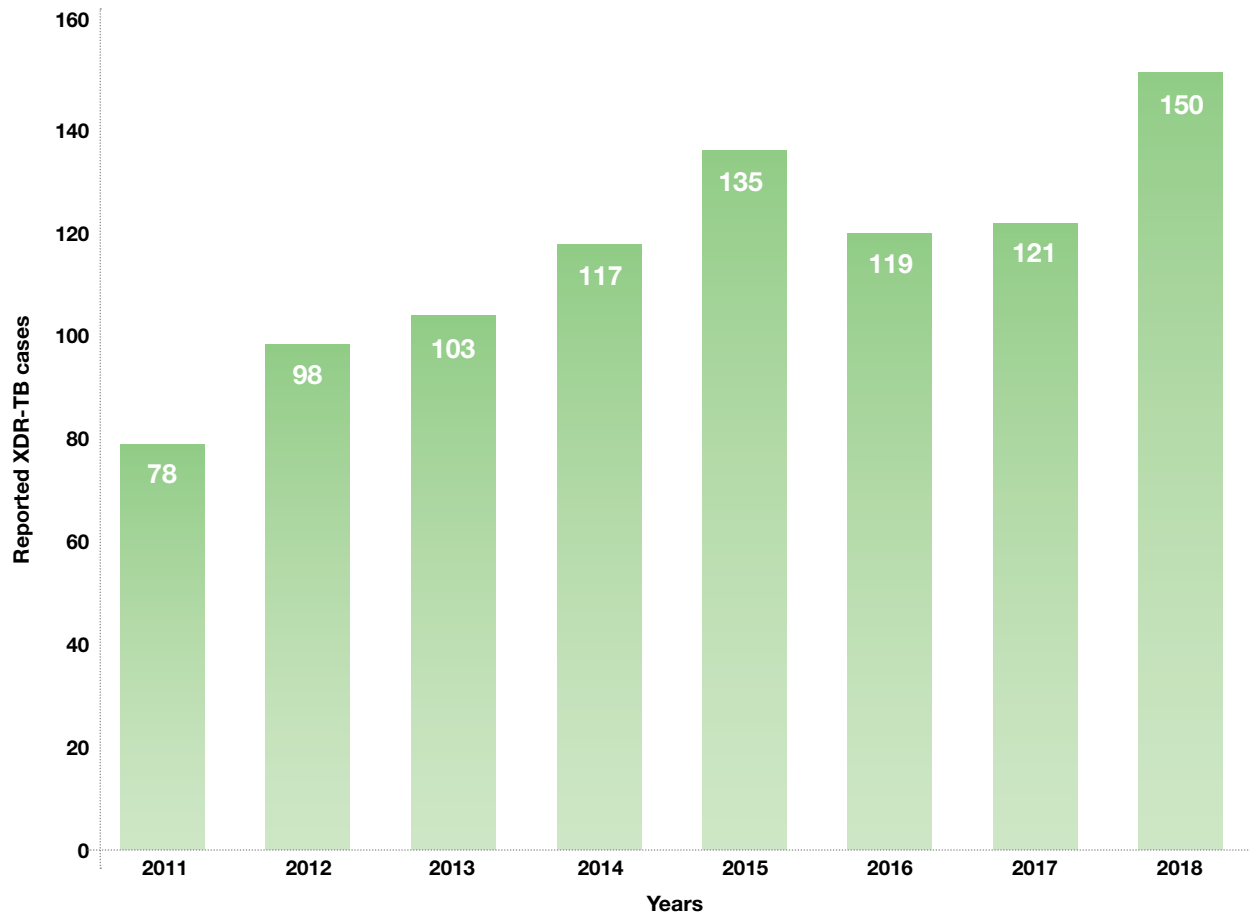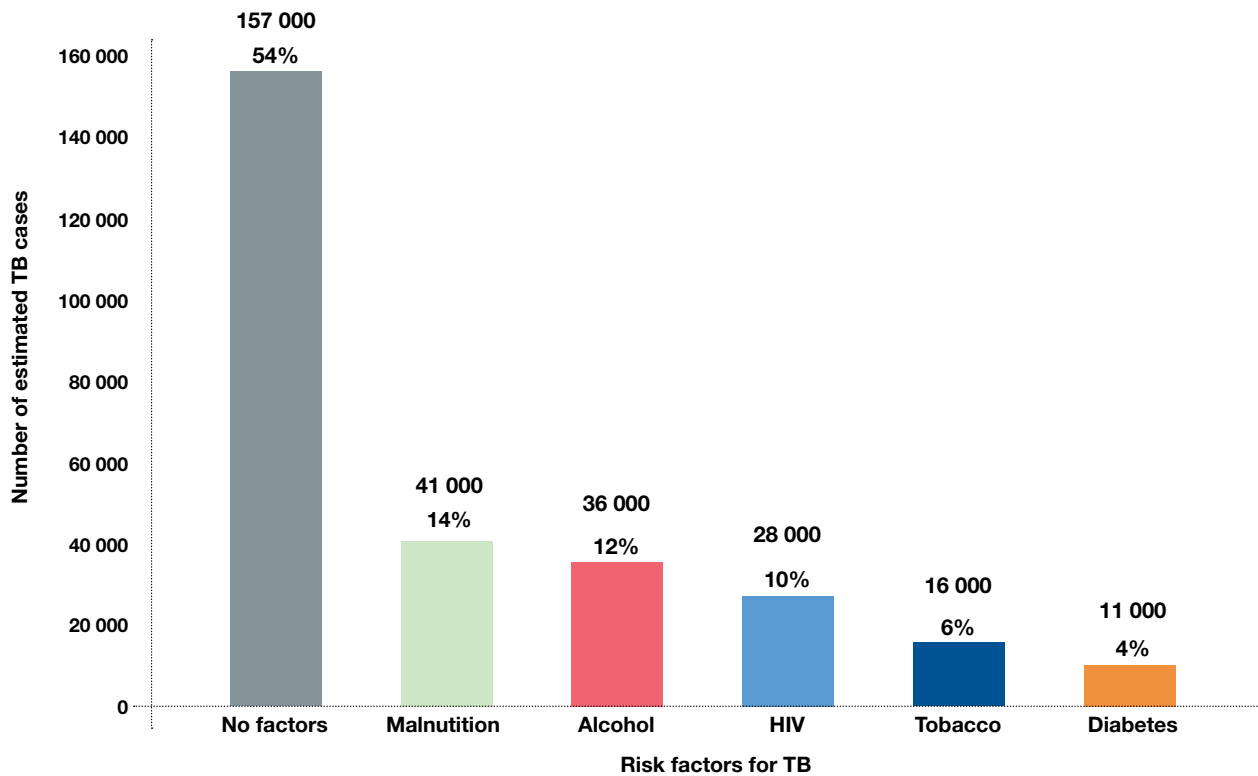

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

TB disproportionately affects the most vulnerable populations, including low-income people, children, ethnic minorities, migrants, PDL, and people with the risk factors mentioned above.

To accelerate progress towards TB elimination, a comprehensive approach to these populations consisting of innovative strategies, interprogrammatic, and intersectoral work, while ensuring the involvement of affected communities, is essential.

8.1 Child and adolescent population

It is estimated that, in 2018, 16,000 children aged 0 to 14 years contracted TB in the Region, of which only 65% were notified, meaning that 5,652 cases were not properly diagnosed or treated (Figure 8.2).

The TB reporting gap is biggest among younger children. In children under 5, only 60% of estimated cases were detected. In seven countries in the Region, the case detection in this group was below 50%: Bolivia (Plurinational State of) (14%), Ecuador (20%), Honduras (33%), Peru (37%), the Dominican Republic (44%), Mexico (47%), and El Salvador (48%). There were no notified cases of TB in this age group in Guyana. In children aged 5 to 14, TB detection was higher, with 69% of estimated cases being detected in this age group; the detection rate remains below 81% for all ages.

Figure 8.2. Estimated and reported TB cases in children under 15, Region of the Americas, 2018
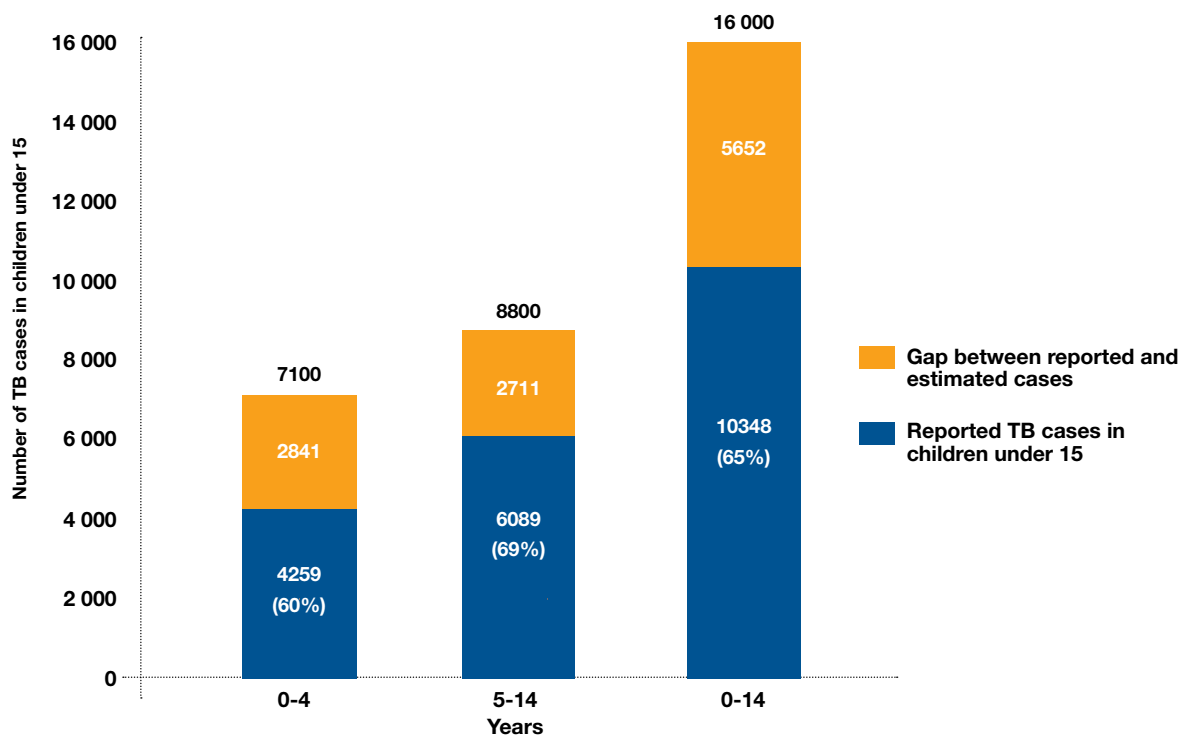
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Children under the age of 15 accounted for 4.4% of all notified cases in the Region in 2018. Among countries with more than 10 notified cases in children, there were marked differences, ranging from 13.6% for Guatemala to 1.4% of cases in Cuba (Figure 8.3). There is no recognizable pattern to explain the heterogeneous distribution of cases in children under 15 years of age across countries.

According to 2018 estimates, 16,000 children aged 0 to 14 years contracted TB in the Region of the Americas. Of these cases, only 65% were reported, i.e., 5,652 children did not receive adequate diagnosis and treatment.

Figure 8.3. Percentage of new and relapse TB cases in children under 15 in selected countries, Region of the Americas, 2018

Legend:
- Children under 5 (%)
- Children aged 5-14 (%)

Country	Children under 5 (%)	Children aged 5-14 (%)	Total
Guatemala	5.9	7.7	13.6
Suriname	9.2	2.9	12.1
Haiti	5.1	5.0	10.1
Argentina	3.8	5.5	9.3
Panama	4.1	3.2	7.3
Nicaragua	2.5	4.6	7.0
Paraguay	3.2	2.8	5.9
Venezuela (Bolivarian Republic of)	2.8	2.7	5.5
Canada	2.8	2.6	5.3
Uruguay	1.8	4.7	2.9
Region of the Americas	1.8	2.6	4.4
United States of America	2.1	2.2	4.3
Peru	1.3	3.0	4.2
Bolivia (Plurinational State of)	0.8	3.0	3.8
El Salvador	1.2	2.5	3.7
Costa Rica	1.0	2.2	3.2
Mexico	1.2	2.0	3.2
Colombia	1.5	1.7	3.2
Brazil	1.3	1.9	3.1
Dominican Republic	1.2	1.6	2.9
Honduras	1.0	1.8	2.7
Ecuador	0.6	2.0	2.6
Chile	1.3	1.3	2.6
Guyana		2.1	2.1
Cuba	0.4	1.0	1.4

Percentage

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.
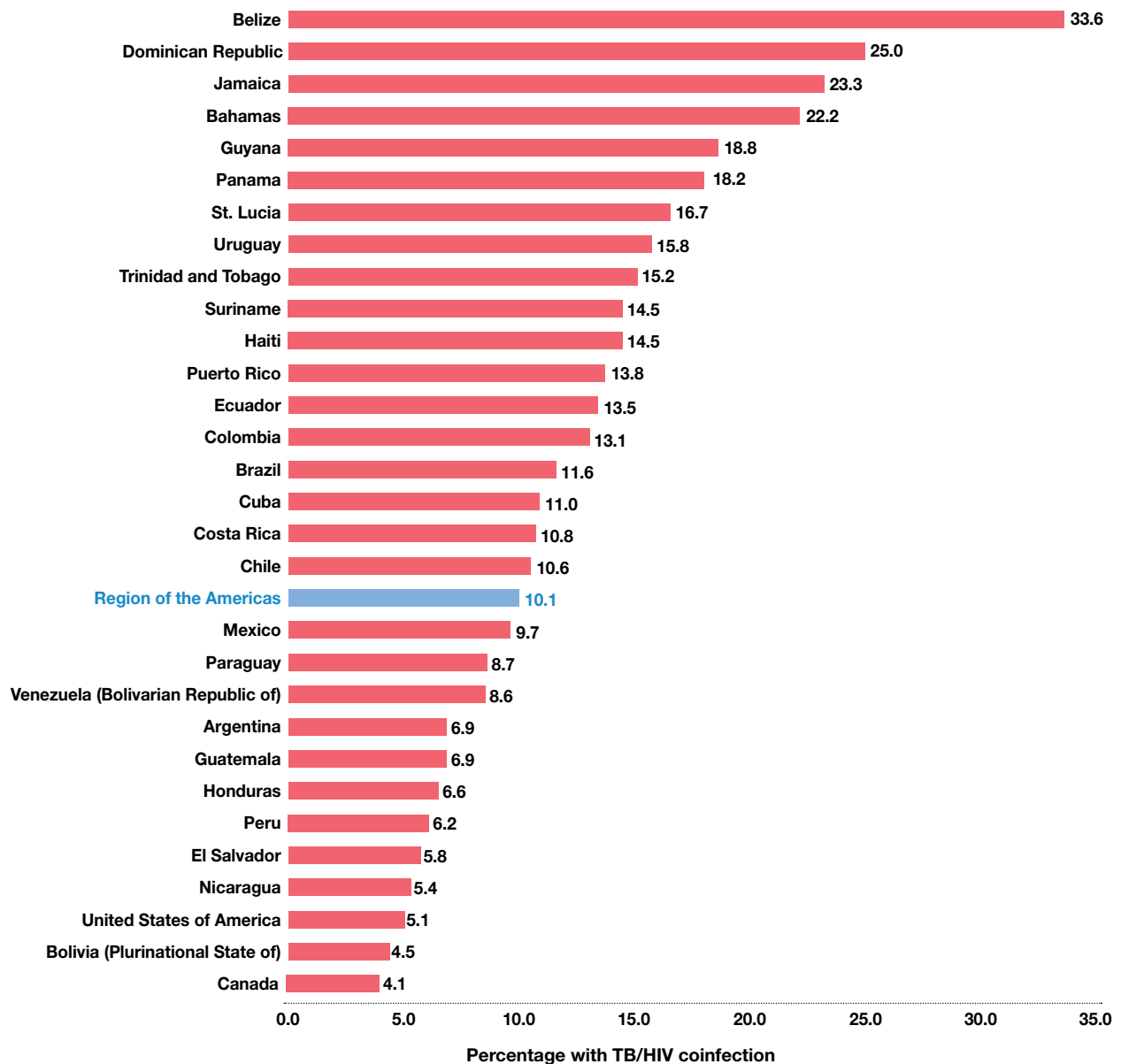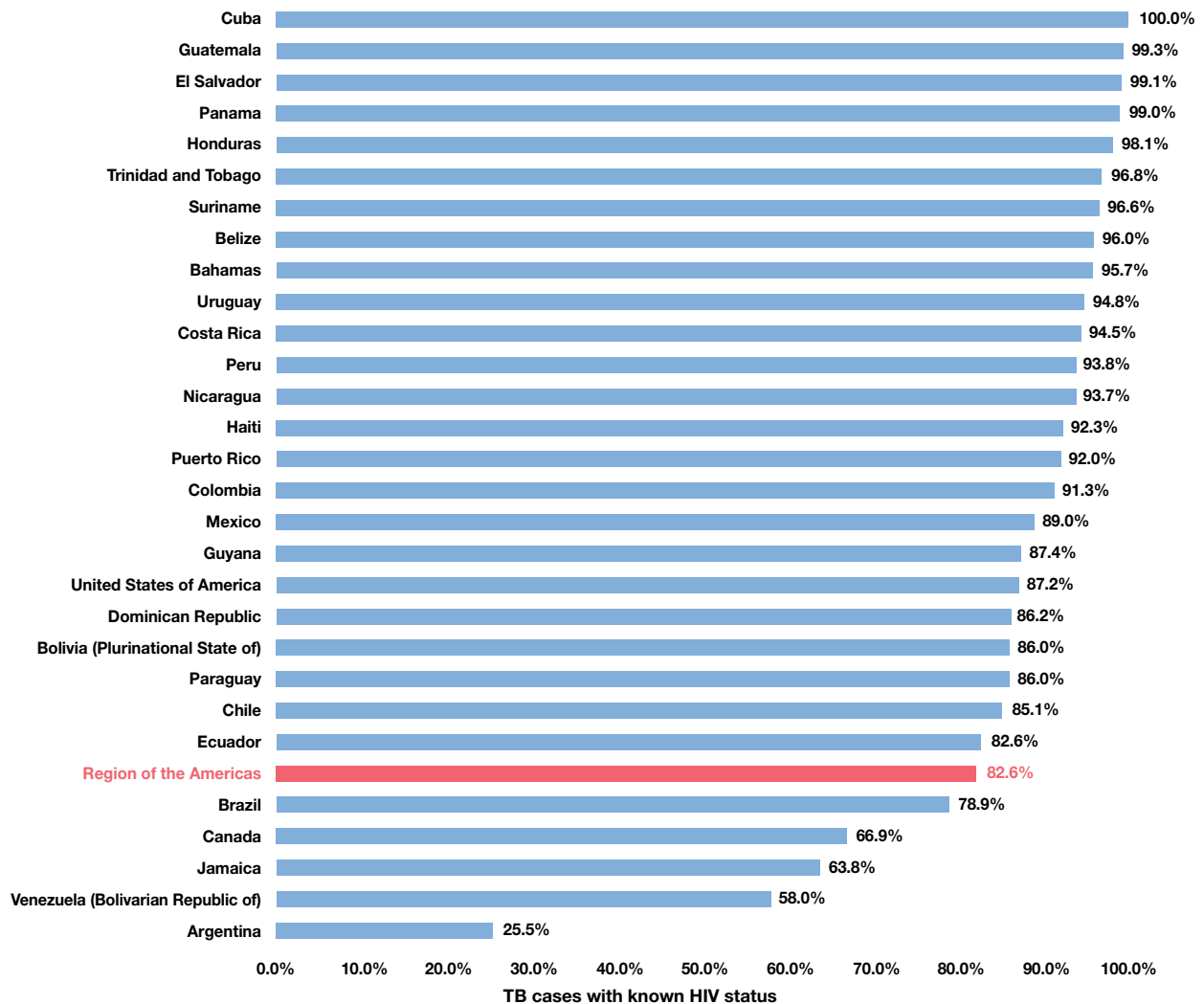
In 2018, 16 countries reported the number of TB cases in children under the age of 20 by five-year groups (Figure 8.4). The reporting rate in the 15-to-19 group was almost three times higher than in children under the age of 15. This reflects the difficulty of diagnosing TB in children and adolescents and the epidemiology of TB, as well as a higher incidence in the group approaching adulthood.

Figure 8.4. Age distribution and TB reporting rate of cases recorded in children under 20, Region of the Americas, 2018
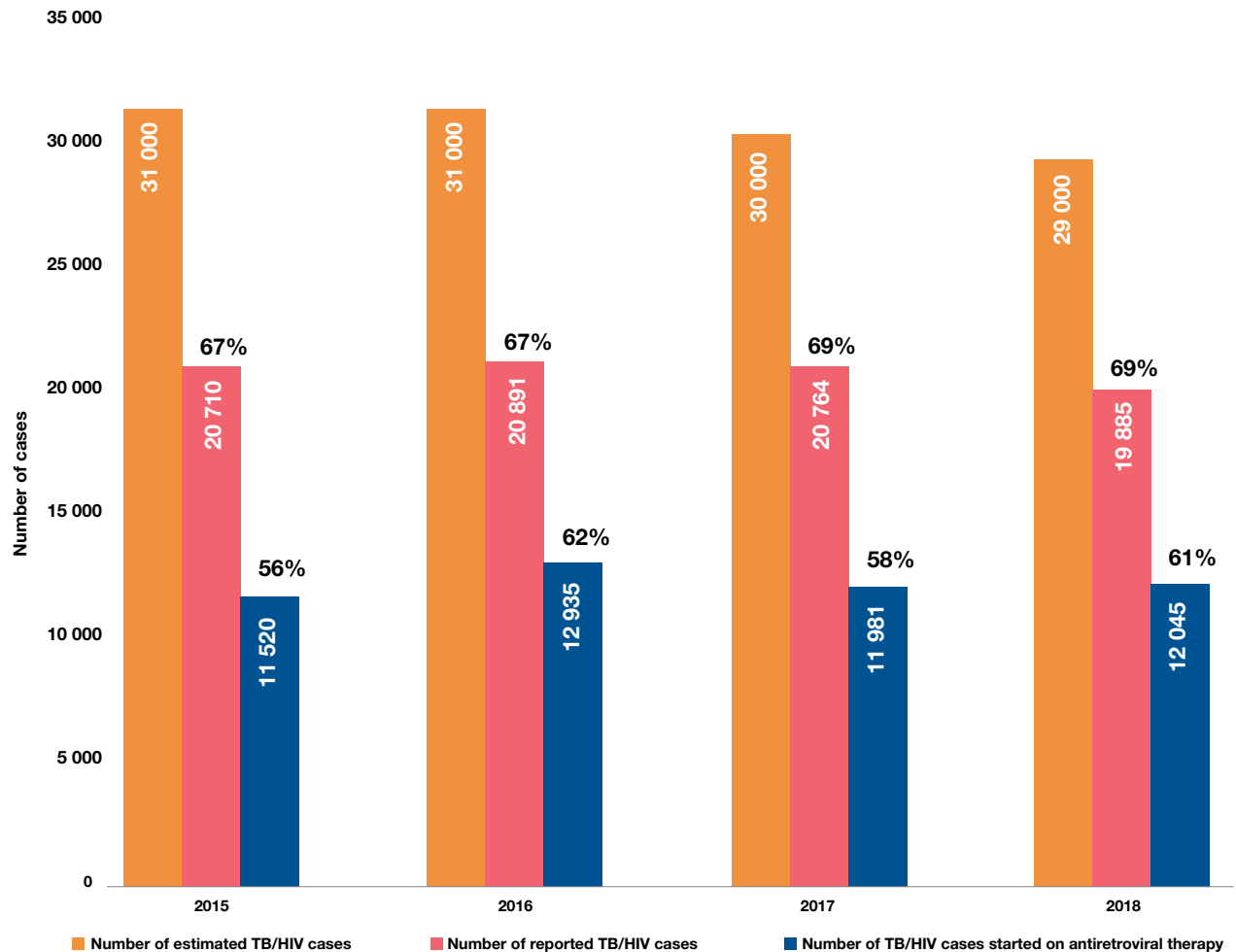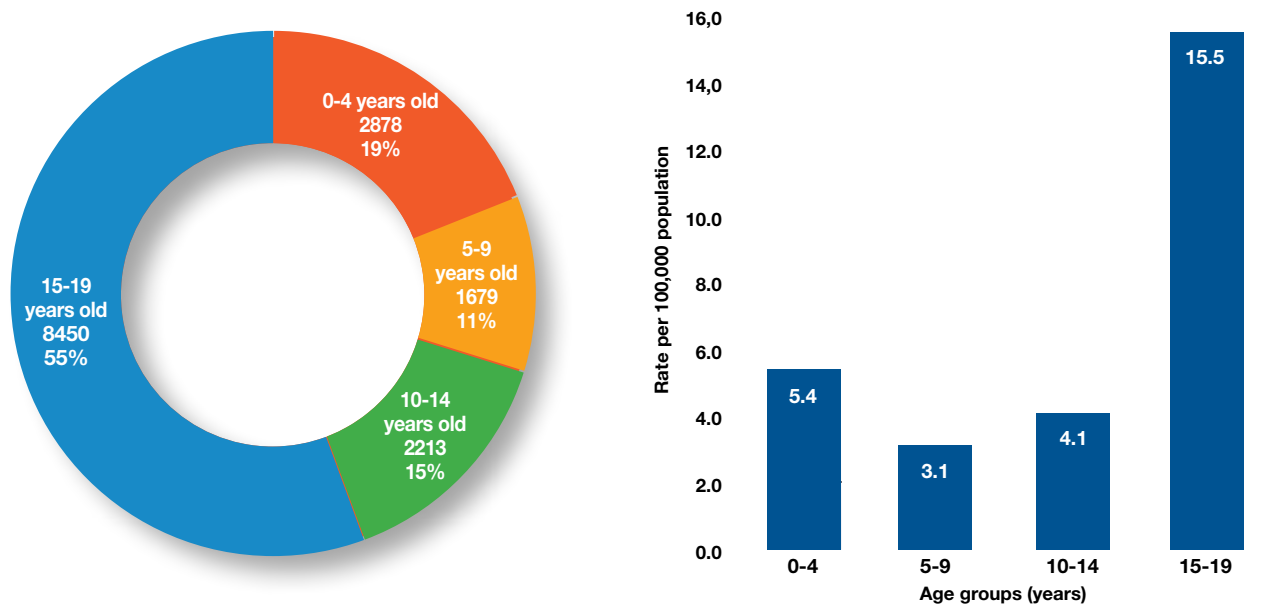

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Regarding TB treatment outcomes in children under 15, the success rate for 2017 was slightly higher than that of total new and relapse cases, at 77% (see Figure 5.1). The rates of mortality and loss to follow-up are lower than for all ages, but the number of cases not evaluated for outcome increased in 2017. These comparative results may show that, once a child is diagnosed with TB, subsequent follow-up is better, given their vulnerability.

The implementation of dispersible oral dosage forms for fixed-dose combinations of TB drugs may support improvement of treatment outcomes in this vulnerable population.

The high-level meeting of the United Nations General Assembly on TB in 2018 and the revision of the *Roadmap towards ending TB in children and adolescents* represent important milestones in consolidating and promoting engagement, resource mobilization, and the joint efforts of stakeholders to address significant gaps in TB prevention and detection in children.[12] The revised Roadmap identifies the most urgent situations which need to be addressed and incorporates another critical population: adolescents between the age of 10 and 19, who are at risk of TB and represent a significant age group in terms of disease control.

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12 Pan American Health Organization. Roadmap towards ending TB in children and adolescents. 2nd ed. Washington, D.C.: PAHO; 2020. Available from: https://apps.who.int/iris/handle/10665/275422.

8.2 People with diabetes mellitus

In 2018, 23 out of 39 countries in the Region (59%) notified 44,972 cases of TB that were tested for diabetes or already known to have diabetes. In countries with more than 10 notified TB cases, 47.8% of all incident cases were tested for diabetes (Figure 8.5).

Figure 8.5. **Percentage of notified TB cases tested for diabetes at diagnosis, Region of the Americas, 2018**
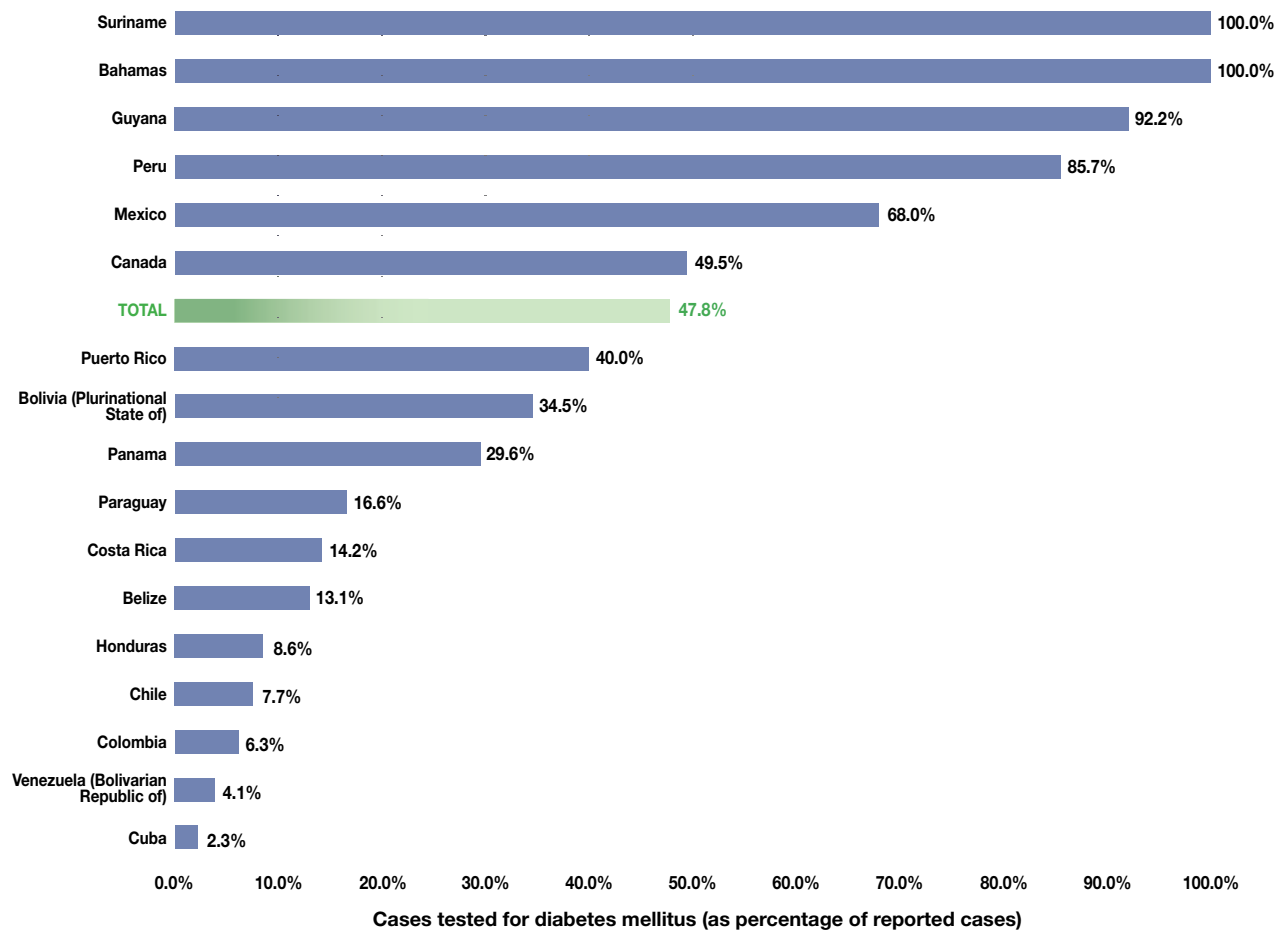
Nota: Includes people with TB who were tested for diabetes and those who already knew their diabetes status. Countries with more than 10 notified TB cases.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In the same year, 28 countries reported that 10.1% (21,135) of the total notified incident TB cases had comorbid diabetes. This rate ranged from 2.6% in Panama to 40% in Puerto Rico (Figure 8.6). This reflects the growing association between TB and diabetes and the great vulnerability of diabetic patients to developing TB.

Of the total notified incident cases of TB, 10.1% (21.135) had comorbid diabetes.

Figure 8.6. Proportion of TB cases with comorbid diabetes mellitus in relation to total notified TB cases, Region of the Americas, 2018

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

8.3 Persons deprived of liberty

The incidence of TB in prisons is much higher than in the general population. In some cases, it is up to a hundred times higher[13, 14, 15].

In 2018, data from 35 countries showed that 8.9% (20.888) of notified incident TB cases were recorded in PDL (Figure 8.7). Six countries reported percentages higher than this regional value, including El Salvador, at 55.5%. Eight countries with low TB incidence reported no cases of TB in prisons.

Figure 8.7. Number and proportion of TB cases in persons deprived of liberty in relation to total notified incident TB cases, Region of the Americas*, 2018

Country	Number	Percentage
El Salvador	2006	55.5%
Paraguay	437	16.9%
Venezuela (Bolivarian Republic of)	1840	16.7%
Brasil	9335	11.3%
Ecuador	637	10.7%
Peru	3243	10.3%
Region of the Americas	20 888	8.9%
Bahamas	4	8.5%
Cuba	60	8.5%
Honduras	238	2.4%
Costa Rica	32	8.0%
Uruguay	73	7.3%
Dominican Republic	280	7.3%
Trinidad and Tobago	17	7.1%
Colombia	783	6.0%
Guatemala	210	5.9%
Panama	89	5.2%
Belize	5	5.1%
Bolivia (Plurinational State of)	299	3.9%
United States of America	296	3.5%
Suriname	5	2.9%
Nicaragua	58	2.8%
Argentina	254	2.5%
Haiti	246	1.8%
Mexico	392	1.7%
Guyana	8	1.6%
Chile	39	1.3%

Percentage of total reported cases

*Countries with 10 or more TB cases notified in 2018.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

13 Pan American Health Organization. Tuberculosis in the Americas 2018. Washington, D.C.: PAHO; 2016. Available from: https://iris.paho.org/handle/10665.2/49510.
14 World Health Organization. Status paper on prisons and tuberculosis. Copenhagen: WHO; 2007. Available from: http://www.euro.who.int/_data/assets/pdf_file/0004/69511/E89906.pdf.
15 World Health Organization. Prisons and Health (WHO/EURO). Chapter 8. TB prevention and control care in prison. Available from: http://www.euro.who.int/_data/assets/pdf_file/0005/249197/Prisons-and-Health,-8-TB-prevention-and-control-care-in-prisons.pdf?ua=1.

According to available data on the prison population of 25 countries, the regional reporting rate in this population was 671.1 cases of TB per 100,000 (Figure 8.8), representing a relative risk of 27.4, i.e., PDL in the Americas are 27 times more likely to contract TB than the general population. In El Salvador, Paraguay, and Venezuela (Bolivarian Republic of), this relative risk was greater than 85. These figures once again confirm the very high vulnerability to TB and high risk of transmission for those who work, visit, and live close to prisons.

Figure 8.8. TB reporting rate among persons deprived of liberty, selected countries, Region of the Americas, 2018
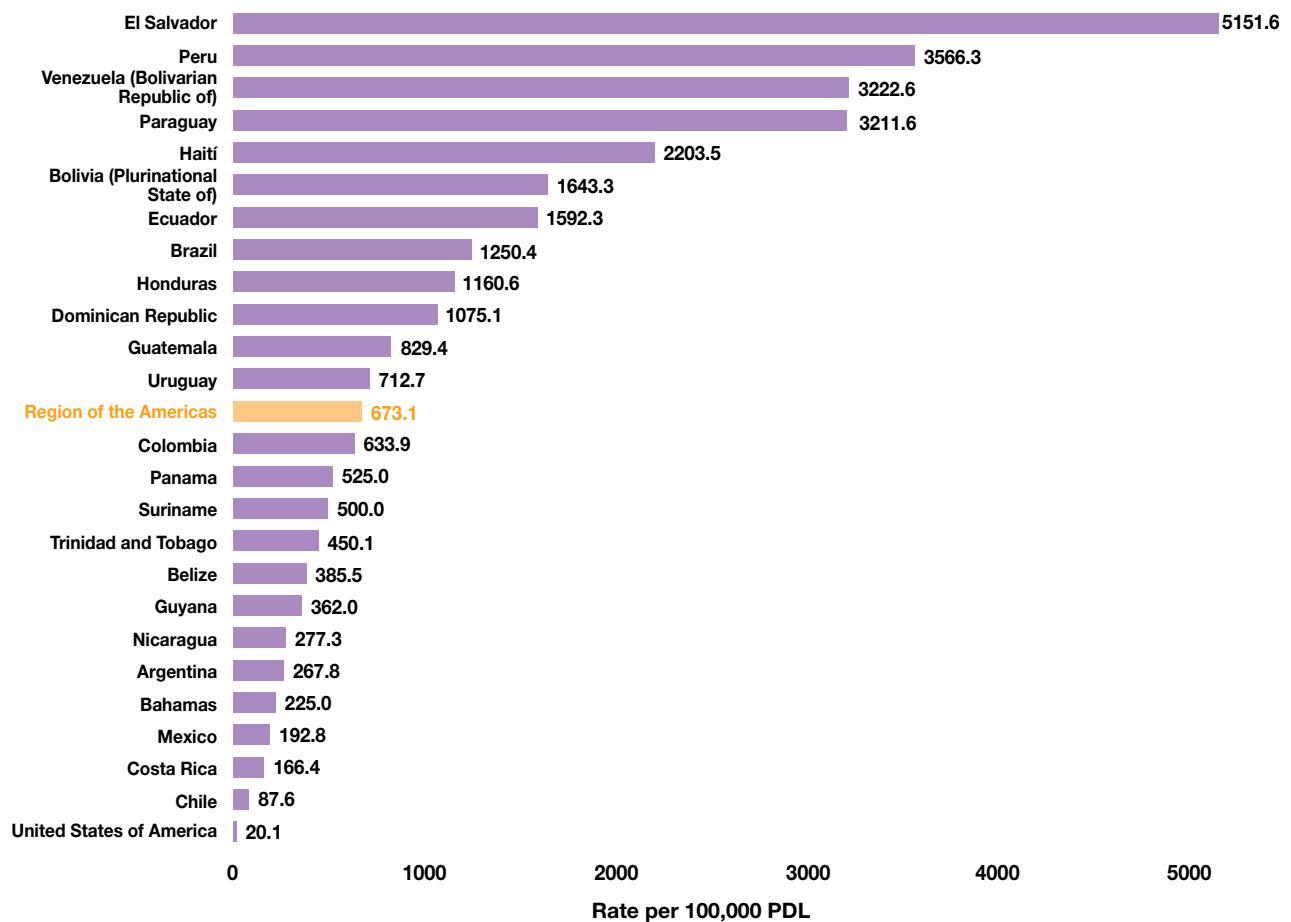
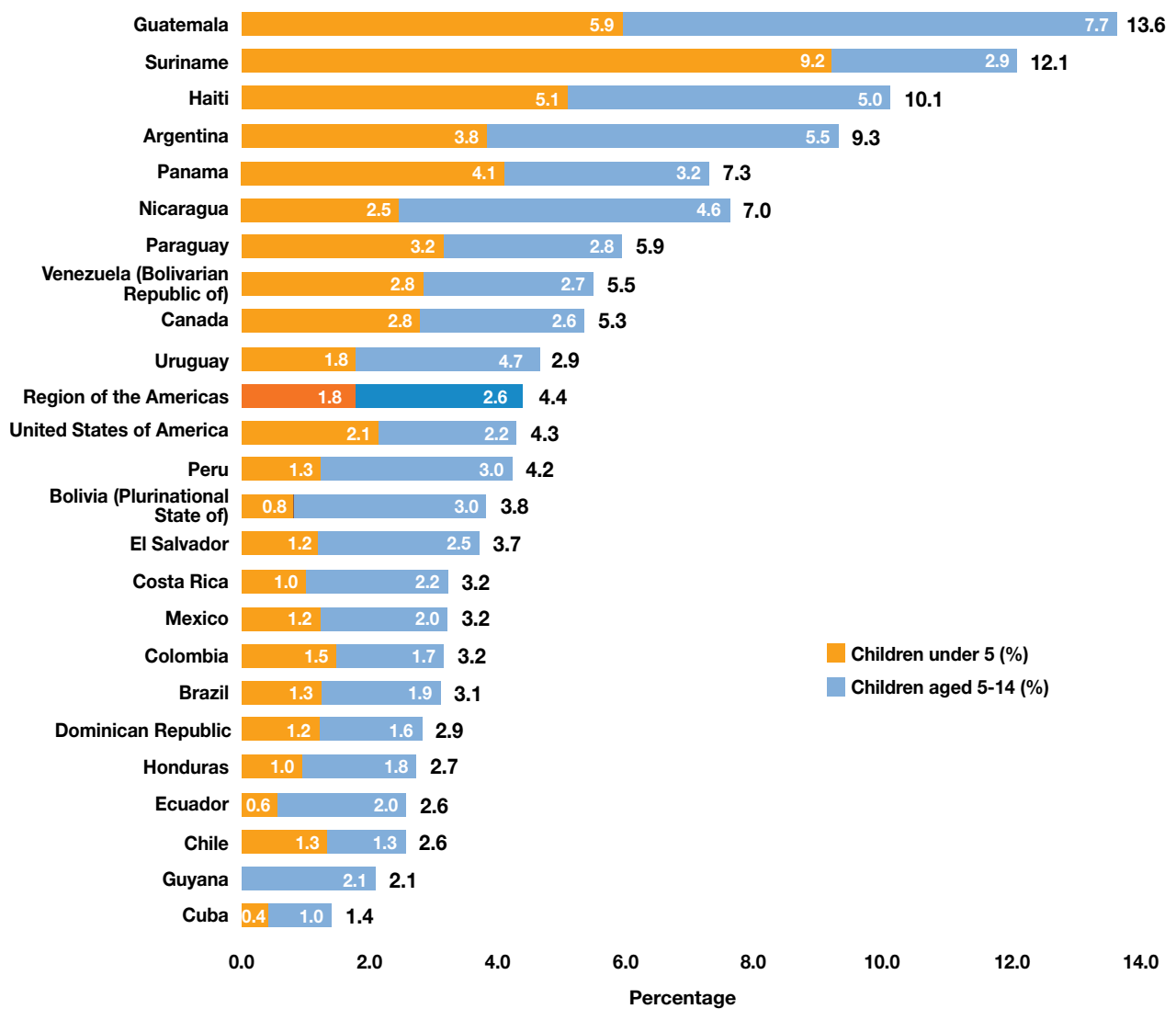| Country	Rate per 100,000 PDL
El Salvador	5151.6
Peru	3566.3
Venezuela (Bolivarian Republic of)	3222.6
Paraguay	3211.6
Haití	2203.5
Bolivia (Plurinational State of)	1643.3
Ecuador	1592.3
Brazil	1250.4
Honduras	1160.6
Dominican Republic	1075.1
Guatemala	829.4
Uruguay	712.7
Region of the Americas	673.1
Colombia	633.9
Panama	525.0
Suriname	500.0
Trinidad and Tobago	450.1
Belize	385.5
Guyana	362.0
Nicaragua	277.3
Argentina	267.8
Bahamas	225.0
Mexico	192.8
Costa Rica	166.4
Chile	87.6
United States of America	20.1

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Data on persons deprived of liberty in each country were obtained from *The World Prison Population*, 12th ed., an online database available at www.prisonstudies.org. The Institute for Crime and Justice Policy Research (ICPR) at Birkbeck, University of London (www.icpr.org.uk), hosts and maintains the World Prison Brief database and publishes *Prison Lists*.

8.4 Indigenous peoples

The indigenous peoples of the Americas have been identified as highly vulnerable to TB. Their invisibility and exclusion represent a challenge to achieving the health-related SDG goals, such as universal access to health and universal health coverage, and to ending TB[16].

In 2018, 29 countries reported the number of TB cases diagnosed in indigenous populations. Ten of them reported no cases of TB in the indigenous population; the remaining 19 reported 11,608 cases, representing 7.0% of the total cases of TB incidents reported by these countries (Figure 8.9). Brazil, Guatemala, and Mexico accounted for 75.8% of TB cases in indigenous people.

Figura 8.9. **Percentage of notified TB cases in indigenous populations in selected countries, Region of the Americas, 2018**
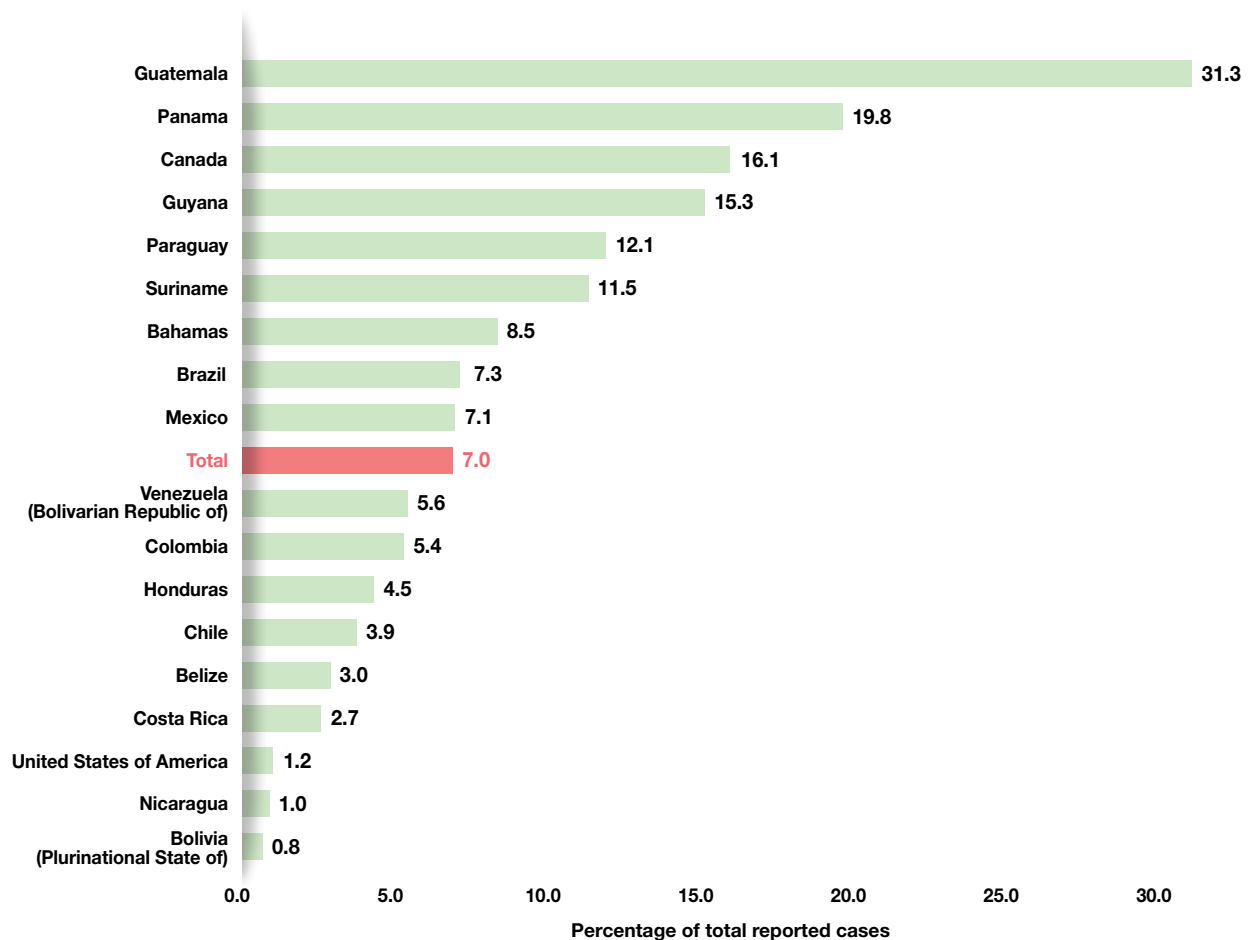
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

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16 Pan American Health Organization. Policy on Ethnicity and Health. CSP29/7, Rev. 1. September 28, 2017. 29th Pan American Sanitary Conference, 69th Session of the Regional Committee of WHO for the Americas; Washington, D.C.: PAHO; 2017. Available from:
    https://iris.paho.org/bitstream/handle/10665.2/34447/CSP29-7-e.pdf?sequence=1&isAllowed=y.

Information on the size of the indigenous population is available for 11 countries.[17, 18] Among these, Brazil, Colombia, Panama, Paraguay, and Venezuela (Bolivarian Republic of) notified TB rates in the indigenous population which exceeded those of the general population, with a relative risk ranging from 1.8 in Panama to 15.7 in Brazil (Figure 8.10) The vulnerability of indigenous peoples to TB is once again corroborated and represents an urgent demand for accelerated implementation of specific interventions for these population groups, in line with their cultural, linguistic, and sociodemographic characteristics.

Figura 8.10. TB notification rates in the indigenous population and in the general population for selected countries, Region of the Americas, 2018
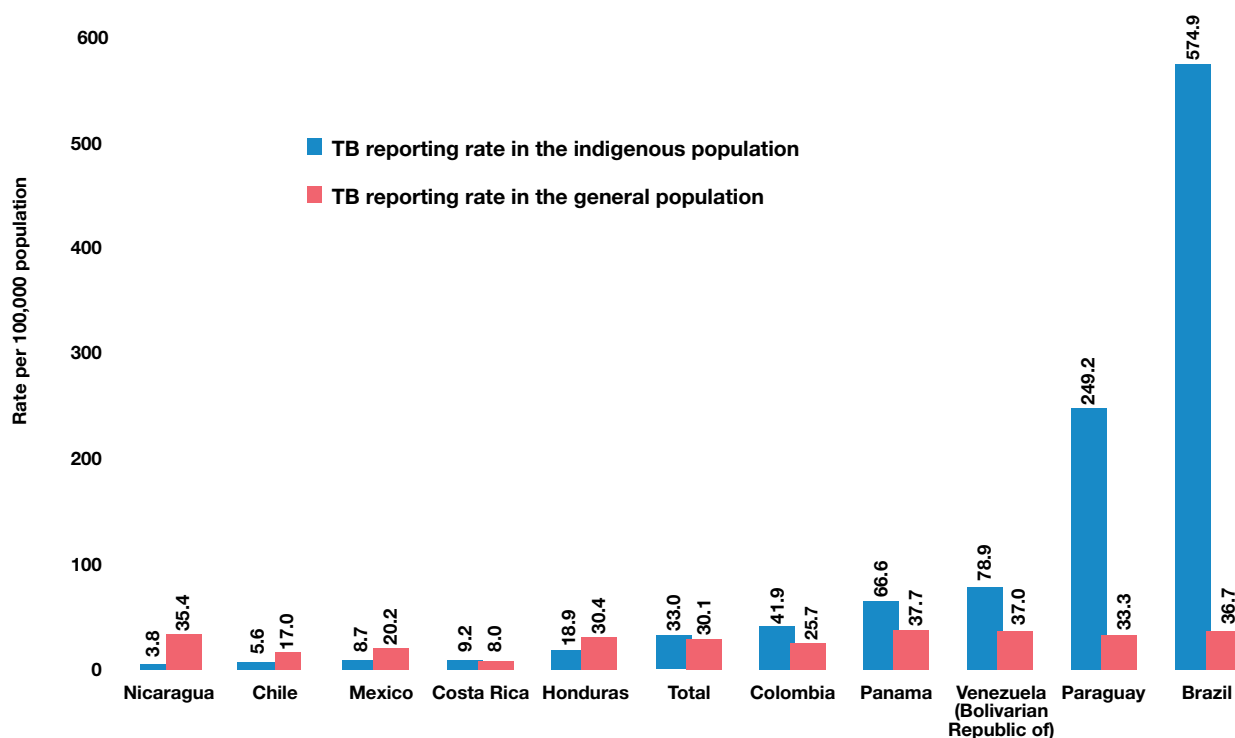
Sources: Organización World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Pan American Health Organization. Guidelines for the prevention and control of tuberculosis in indigenous peoples of the Americas. PAHO; 2020. In press.

Economic Commission for Latin America and the Caribbean. *Los pueblos indígenas en América Latina. Avances en el último decenio y retos pendientes para la garantía de sus derechos*. Santiago, Chile: ECLAC; 2014 (in Spanish).

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17 Pan American Health Organization. Guidelines for the prevention and control of tuberculosis in indigenous peoples of the Americas. PAHO; 2020. In press.
18 Economic Commission for Latin America and the Caribbean. *Los pueblos indígenas en América Latina. Avances en el último decenio y retos pendientes para la garantía de sus derechos*. Santiago, Chile: ECLAC; 2014 (in Spanish).

9 Funding for TB prevention and control

Appropriate, sustained funding for several years is essential to advancing TB prevention, diagnosis, and treatment. Since 2002, WHO has monitored TB funding in all countries. The results are published once yearly in the Global tuberculosis Report[19] or in scholarly articles[20].

Not all countries can report their TB prevention and control funding in detail. For this reason, 13 of the 35 countries of the Americas report only the total budget and the amount expended. Conversely, the remaining 22 report their budget and expenditures broken down by line item and source of funding. Box 9.1 describes the key concepts used in this annual data collection.

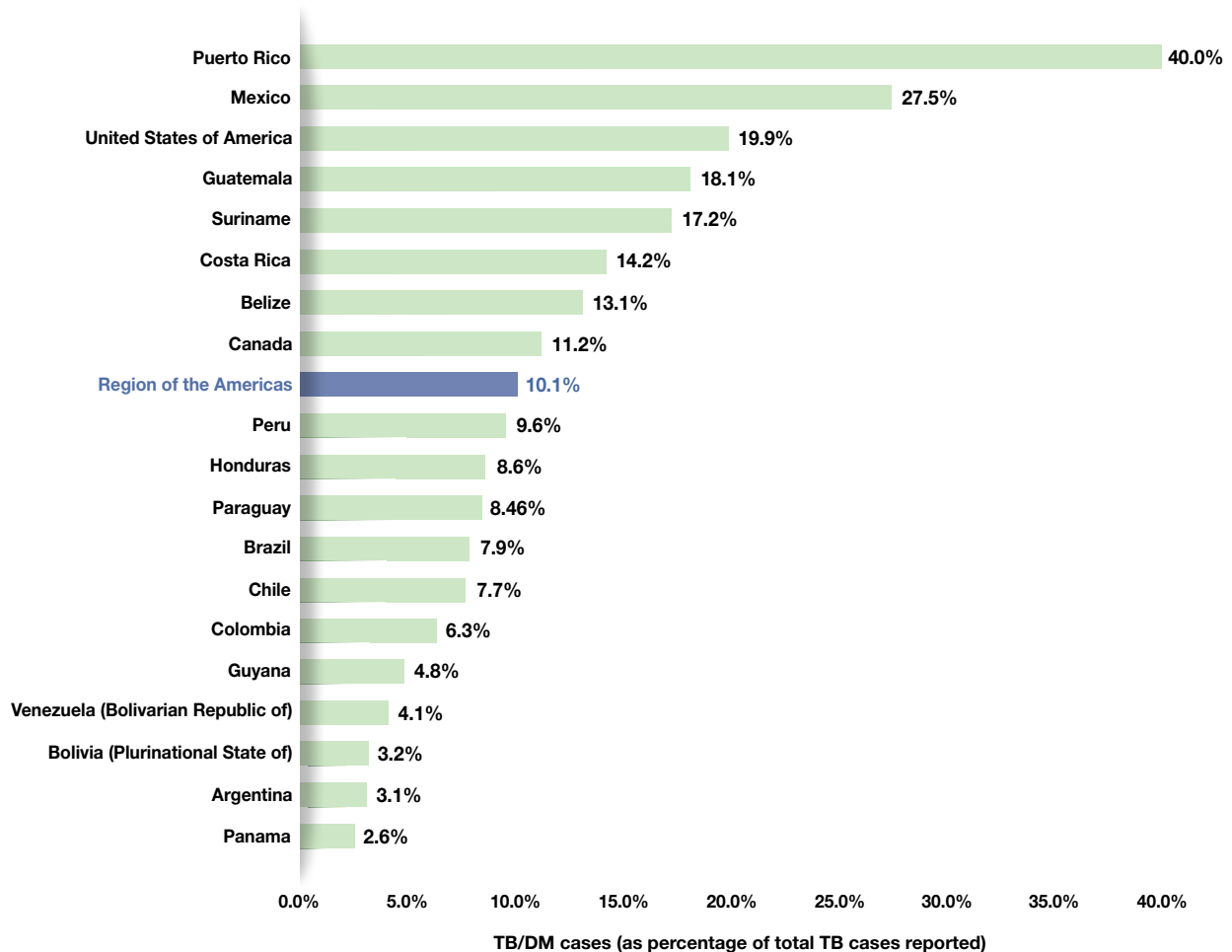19 World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

20 Floyd K, Fitzpatrick C, Pantoja A, 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:e105-115. http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(13)70032-9/fulltext#sec1.

Box 9.1. Key concepts used in annual rounds of data collection by WHO

Concept	Definition
Funding gap	Budgeted amount minus available funds
Total cost for TB prevention and treatment	Budget plus costs associated with the use of health services
Available funding	Funding (state and from other sources, e.g., Global Fund or USAID) expected to be available
Received funding	Resources available for implementation of activities
Expenditures	Funding spent on program activities
Budget	Amount needed to implement the TB strategic plan, regardless of available funding
Use of general health services	Cost of patient care at the health facility for directly observed treatment minus the usual number of visits. For inpatient care, cost of hospitalization minus the percentage of hospitalized patients and length of stay. The cost of general health services utilization is estimated from unit prices in the WHO database. The WHO/TB methodology assumes that these are fully funded by governments.

Global Fund: Global Fund to Fight AIDS, TB and Malaria; TB: tuberculosis; USAID: United States Agency for International Development.

Table 9.1 provides an overview of the financial data. It includes the budget, available funds, funding gap (as percentage of budget), expenditures, and funds received as reported to WHO by 35 countries in the Americas for 2017, 2018, and 2019.

The budget of the Region of the Americas for the last three years amounts to approximately USD 450 million. Minus the U.S. budget, the total comes to approximately USD 320 million.

Table 9.1. Budget, available funds, funding gap, expenditures, and received funding by country, Region of the Americas, 2017, 2018, and 2019

Country	Budget (USD millions)			Available funding (USD millions)		Funding gap (as percentage of budget)		Expenditures (USD millions)		Received funding (USD millions)	
	2017	2018	2019	2018	2019	2018	2019	2017	2018	2017	2018
Antigua and Barbuda	NR	NR	NR	*	*	*	*	NR	NR	*	*
Argentina	4.6	5.2	2.5	5.2	2.5	0.0	0.0	3.3	1.8	3.3	1.8
Bahamas	NR	NR	NR	*	*	*	*	NR	NR	*	*
Barbados	NR	NR	NR	*	*	*	*	NR	NR	*	*
Belize	0.3	0.5	0.5	0.5	0.5	0.0	0.5	0.4	0.5	0.6	0.4
Bolivia (Plurinational State of)	NR	6.4	6.9	6.4	6.9	0.0	0.0	2.9	4.0	2.9	7.0
Brazil	67.0	56.7	38.2	47.9	38.2	15.3	0.0	46.7	35.8	46.7	35.8
Canada	NR	NR	NR	*	*	*	*	NR	NR	*	*
Chile	NR	3.0	4.3	0.3	94.1	91.6	94.1	NR	NR		
Colombia	12.2	12.1	4.7	3.7	4.1	69.0	10.0	4.0	4.0	4.0	4.0
Costa Rica	NR	NR	NR	*	*	*	*	NR	NR	*	*
Cuba	27.0	1.1	1.1	*	*	*	*	1.1	1.1	*	*
Dominica	NR	NR	NR	*	*	*	*	NR	NR	*	*
Dominican Republic	14.5	25.6	33.4	21.4	21.2	16.0	36.3	14.1	19.0	14.1	19.0
Ecuador	1.7	1.1	1.0	0.5	1.0	55.3	0.0	NR	0.5		0.5
El Salvador	5.9	5.9	11.8	5.9	11.8	0.0	0.0	3.8	14.0	3.8	14.0
Grenada	NR	NR	NR	*	*	*	*	NR	NR	*	*
Guatemala	5.4	19.4	2.9	3.1	2.9	83.7	0.0	2.3	2.7	2.8	4.4
Guyana	1.2	1.5	1.7	1.0	1.1	30.6	30.9	0.6	1.2	1.1	1.3
Haiti	10.1	10.9	12.5	8.5	10.1	21.7	18.9	9.2	6.2	9.2	6.2
Honduras	11.0	11.0	4.9	5.7	4.9	48.0	0.0	4.0	3.7	5.3	3.7
Jamaica	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mexico	17.4	12.0	11.1	12.0	11.1	0.0	0.0	15.8	12.1	15.8	12.1
Nicaragua	NR	9.9	10.5	8.0	7.6	18.7	27.5	NR	5.4	NR	9.1
Panama	2.3	1.9	NR	0.9	NR	49.6	NR	1.9	NR	1.9	NR
Paraguay	22.6	24.6	21.6	4.7	5.1	80.7	76.1	4.3	4.8	4.5	4.9
Peru	101.2	134.5	140.7	132.9	132.1	1.1	6.1	71.3	132.5	80.1	141.5
Saint Kitts and Nevis	NR	NR	NR	*	*	*	*	NR	NR	*	*
Saint Lucia	NR	NR	NR	*	*	*	*	0.1	NR	*	*
St. Vincent and the Grenadines	NR	NR	NR	*	*	*	*	NR	NR	*	*
Suriname	1.6	1.6	1.0	0.8	0.8	49.6	10.4	0.4	0.8	0.4	0.8
Trinidad and Tobago	NR	NR	NR	*	*	*	*	NR	NR	*	*
United States of America	142.3	135.0	135.0	*	*	*	*	135.0	135.0	*	*
Uruguay	4.4	4.7	5.1	4.7	5.1	0.0	0.0	4.0	4.4	4.0	4.4
Venezuela (Bolivarian Republic of)	0.7	2.9	2.7	0.4	0.6	86.1	79.0	0.02	0.4	0.02	0.4
Total	453	488	454	274	362	44	20	325	390	201	271

*Data not collected in these countries.
NR: not reported.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

9.1 Budgets of national TB programs for TB prevention and care

Figure 9.1 shows the trend in NTP budgets and available funding from 2009 to 2019 in the 11 countries with the highest TB burden in the Region.[21] The total budget in these 11 countries is USD 239 million.

There has been a clear decrease in TB budgets in Brazil, Colombia, and Mexico. However, this reduction does not reflect a decline in the epidemic nor in the number of TB patients. The reason for this decline is the end of financing from the Global Fund to Fight AIDS, Tuberculosis and Malaria, which means that budgets are now based solely on the available public funding. Despite the Global Fund's exit from several countries, patient care should remain the same or better; therefore, it is not the budget that needs to change, but rather the source of funding. The budget should reflect needs and activities in accordance with national strategic plans, regardless of the relationship with the Global Fund or other sources of funding.

When a country reports available funds instead of the required budget, its actual financial needs are downplayed and unclear, which discourages government funding and international contributions. When this happens, there is a risk that patients with TB will not be able to access adequate health services.

Unlike the three high-burden countries mentioned above, countries such as Bolivia (Plurinational State of), El Salvador, Haiti, Peru, and the Dominican Republic have growing budgets, reflecting increased needs to address TB. On average, these countries have also reported an increase in the volume of treated patients. As shown in Figure 9.1, some countries have difficulty reporting data, and the quality of information remains an issue.

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21 Panama is not included because it is a high-income country, according to the World Bank classification. Panama did not report data for the year 2019.

Figure 9.1. Budgets and available funding for TB in the 11 countries with the highest TB burden in the Region of the Americas, 2009-2019
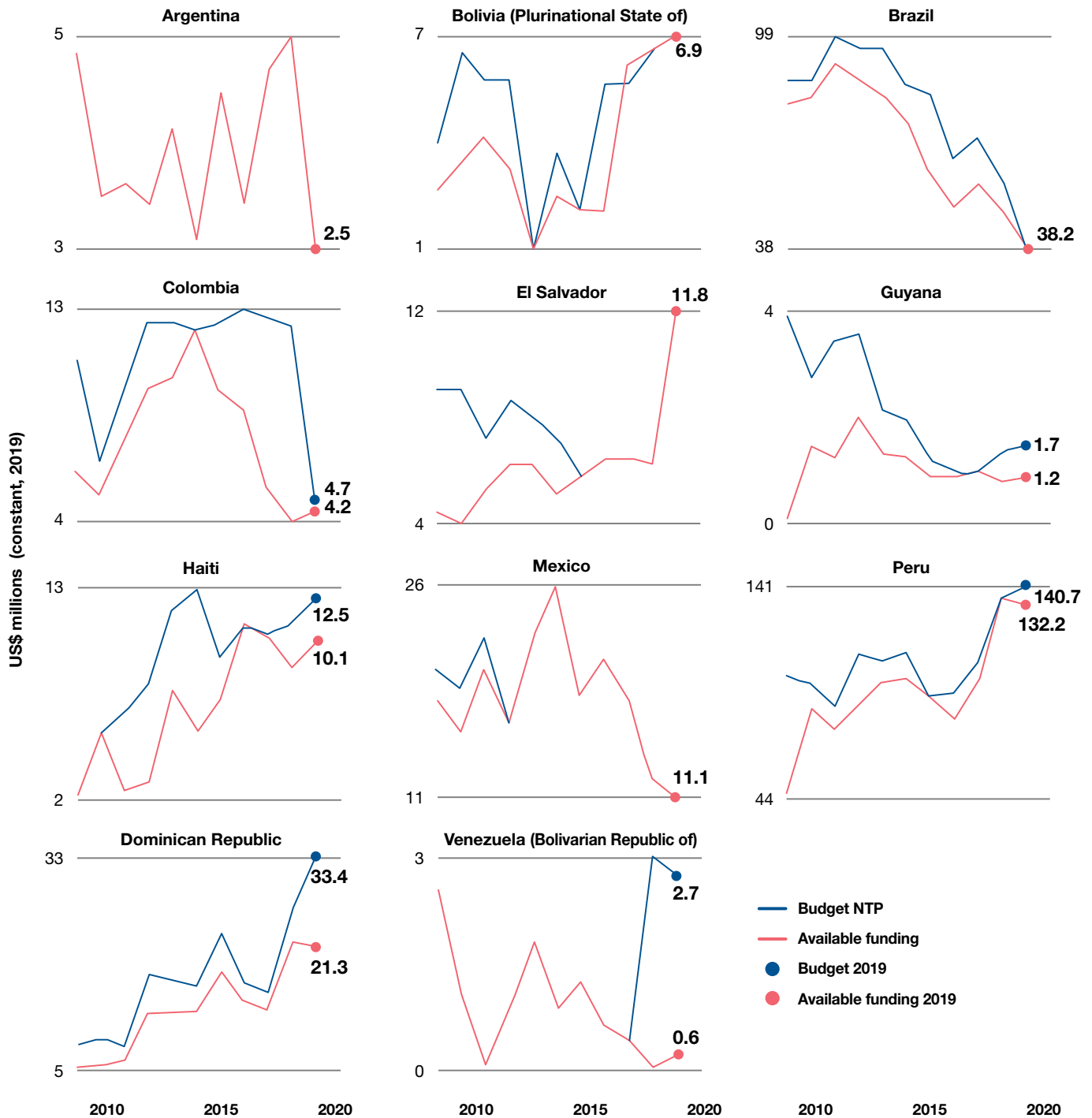
US$ millions (constant, 2019)

Argentina — 2.5

Bolivia (Plurinational State of) — 6.9

Brazil — 38.2

Colombia — 4.7, 4.2

El Salvador — 11.8

Guyana — 1.7, 1.2

Haiti — 12.5, 10.1

Mexico — 11.1

Peru — 140.7, 132.2

Dominican Republic — 33.4, 21.3

Venezuela (Bolivarian Republic of) — 2.7, 0.6

— Budget NTP
— Available funding
● Budget 2019
● Available funding 2019

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

In 2019, the TB budget for the countries with the highest disease burden in the Region was USD 239 million, down 4% from 2018.

9.2 Main sources of funding

Most countries in the Region meet their financial needs with domestic funds, as shown in Figure 9.2. The global trend is that, as countries' economies grow, TB-related financial needs are increasingly met with state funds. Conversely, in lower-income countries, the share of international funds in TB financing is greater.

Figure 9.2. Sources of funding for TB prevention and control stratified by country income level, 21 selected countries, Latin America and the Caribbean, 2019[22]
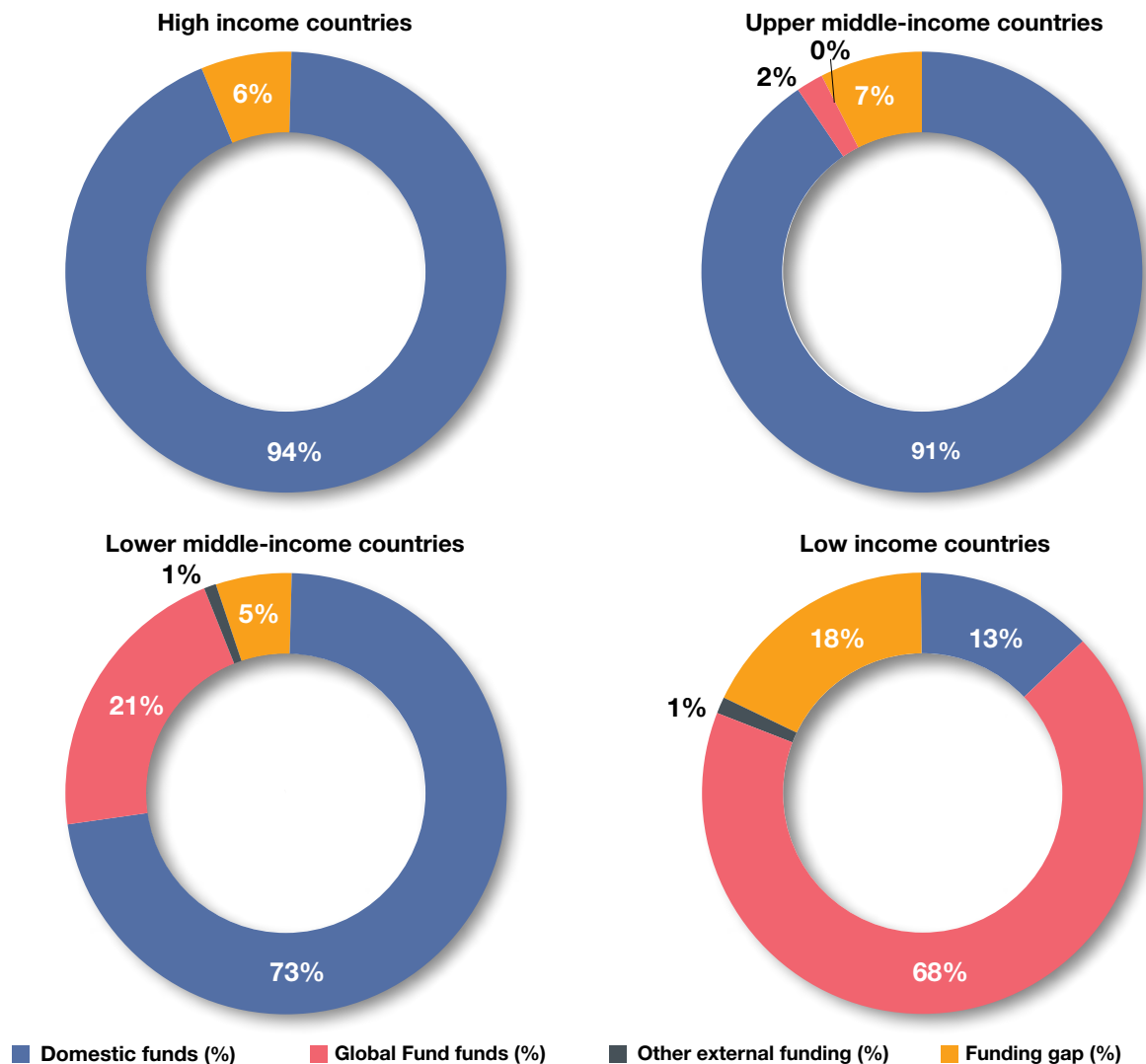
High income countries
6%
94%

Upper middle-income countries
0%
2%
7%
91%

Lower middle-income countries
1%
5%
21%
73%

Low income countries
13%
18%
1%
68%

■ **Domestic funds (%)**   ■ **Global Fund funds (%)**   ■ **Other external funding (%)**   ■ **Funding gap (%)**

Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

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22 The high-income countries are Argentina, Chile, and Uruguay. The upper middle-incomes are Brazil, Colombia, the Dominican Republic, Ecuador, Guyana, Mexico, Panama, Paraguay, Peru, Suriname, and Venezuela (Bolivarian Republic of). The lower middle-income countries are Bolivia (Plurinational State of), El Salvador, Guatemala, Honduras, and Nicaragua. Haiti is the only low-income country.

The Global Fund is the main source of external funding in the Region. Its contribution to this group of 21 countries in 2019 was USD 29 million (Figure 9.2). Global Fund resources for the Region have been drastically reduced since 2011. In the context of the new funding model being implemented by the Global Fund, its funds are expected to continue to decline as some high- and middle-income countries cease to be eligible for grants. Table 9.2 summarizes the total Global Fund resources for the Region since its inception, which includes a total of 45 grants for 16 countries, with a disbursed amount of USD 335 million.

Domestic resources are the main source of funding for TB prevention and control in the region (84%). However, the extent of out-of-pocket spending by patients is unknown.

Table 9.2. Total funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria for the Region of the Americas, 2003 to January 2020

TB grants	Funds signed	Funds committed	Funds disbursed	Total number of grants	Proportion of funding committed for disbursement (%)
Bolivia (Plurinational State of)	28.6	25.9	23.3	5	90
Brazil	21.3	21.3	21.3	2	100
Colombia	8.1	8.1	8.1	2	100
Cuba	7.4	7.4	7.4	1	100
Dominican Republic	35.9	34.5	33.8	5	98
Ecuador	22.2	22.2	22.2	2	100
El Salvador	24.1	22.9	22.4	5	98
Guatemala	19.2	15.4	11.8	2	77
Guyana	4.8	4.2	4	3	95
Haiti	34.5	34.5	34.5	2	100
Honduras	17.9	16.5	16.5	2	100
Nicaragua	22.8	20.8	20	4	96
Panama	0.55	0.55	0.55	1	100
Paraguay	22.0	20.5	20.3	3	99
Peru	91.1	88	85.8	5	98
Suriname	3.2	3.2	3.2	1	100
Total	**363.65**	**345.95**	**335.15**	**45**	

Source: The Global Fund. The Global Fund Data Explorer [Internet]. Tuberculosis. Available from: https://data.theglobalfund.org/investments/home/-/Tuberculosis.

Another important source of funding for TB control is patients' own out-of-pocket spending. Patients incur both medical and non-medical expenditures during the diagnostic and treatment phases. For example, before being diagnosed with TB, patients will have seen a variety of health care providers, which entails expenses with laboratory tests, outpatient visits, or transportation. In addition, each patient incurs indirect costs from working time lost and, therefore, income lost due to TB. All of these costs can lead to financial hardship for patients and their families (i.e., catastrophic costs).

Catastrophic costs are measured through patient surveys and their respective analysis following a standard methodology defined by WHO.[23] In the Region, Brazil and the Dominican Republic started their first surveys in 2019, while other countries such as Argentina, Bolivia (Plurinational State of), Colombia, Chile, Ecuador, El Salvador, Guatemala, Paraguay, and Peru are in the preparation phase.

Worldwide, 12 countries have already completed catastrophic cost surveys. It has been estimated that 26% to 77% of patients and their households face catastrophic costs from TB.[24] In several of these countries, governments have begun to take the necessary steps to reduce these costs. The same is expected to happen in the Americas.

9.3 Availability of TB prevention and care funds

Brazil, Colombia, Haiti, Mexico, and Peru account for 67% of the total estimated TB burden in the Region. In 2019, 70% of the TB funds available in the Americas were concentrated in these five countries. Figure 9.1 shows the trend in NTP budgets and available funding from 2009 to 2019 in the 11 countries with the highest TB burden in the Region. The availability of funds, in addition to those reported by NTPs, also includes government funds that go directly to the general health system to provide inpatient and outpatient care.

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23 World Health Organization. Tuberculosis patient cost surveys: a handbook. Geneva: WHO; 2018. Available from: https://www.who.int/tb/publications/patient_cost_surveys/
24 World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Figure 9.3. Available funds for TB in 21 selected countries in Latin America and the Caribbean, 2009-2019
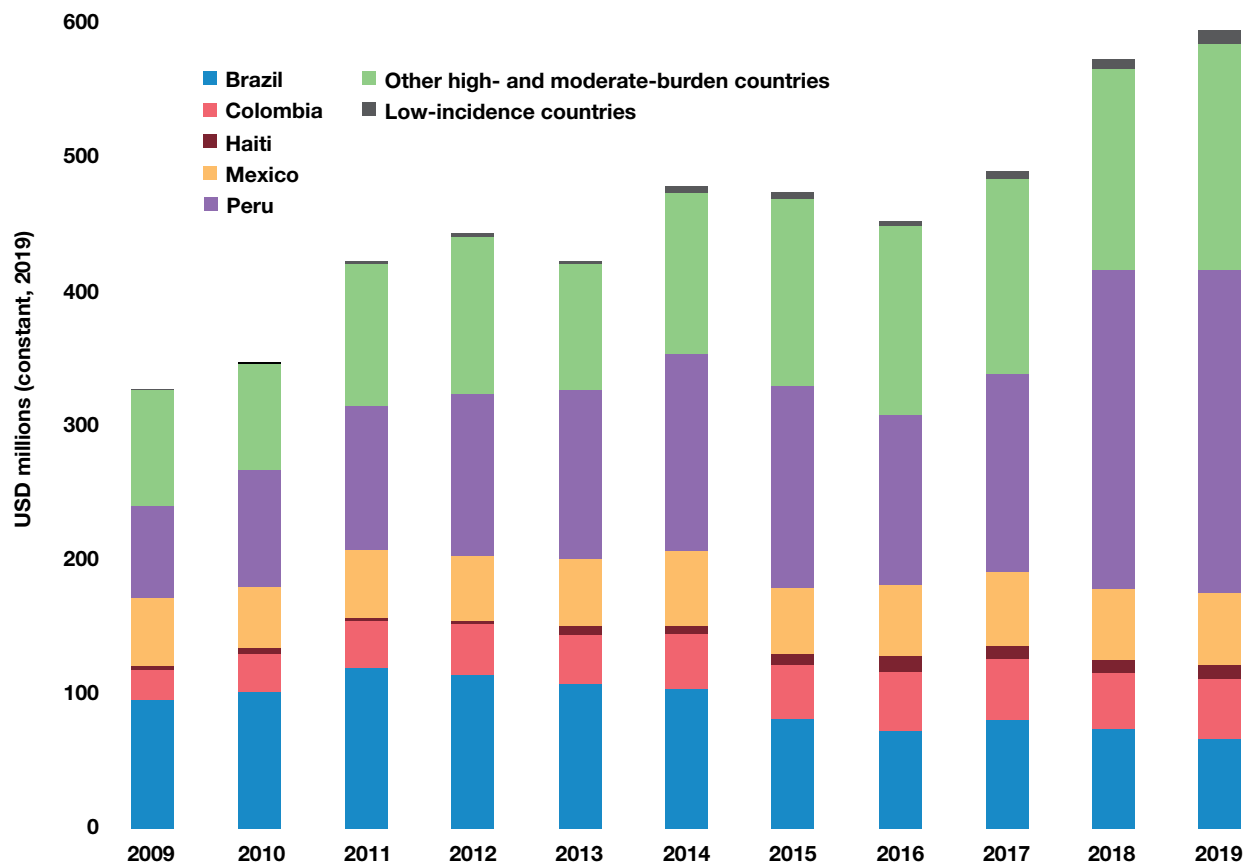
Note: Other high- and moderate-burden countries: Argentina, Belize, Bolivia (Plurinational State of), the Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Nicaragua, Paraguay, Suriname, and Venezuela (Bolivarian Republic of). Low-incidence countries: Cuba, Granada, St. Vincent and the Grenadines, and Saint Lucia. For these countries, the figure only reflects the costs of general health system utilization.
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

The volume of resources available in Brazil declined 22% from 2017 to 2019, largely due to cuts in the budget for NTP staff, program management, and laboratory expenses. Conversely, Peru has increased its available funds by 38% since 2018. The two factors that explain this change in Peru are the increase in the NTP budget to manage MDR-TB and increased use of general health services due to increased hospitalization of patients with MDR-TB.

In 2019, Latin America and the Caribbean had USD 595 million available for TB prevention and care.

Figure 9.4 shows the trend in available funding broken down by budget line item, from 2009 to 2019, for the 11 countries with the highest TB burden. The budget line items with the most funds are use of general health services (outpatient and inpatient services) and general program management.[25]

Figure 9.4. Available funding broken down by budget line item, 11 countries with the highest TB burden, Latin America and the Caribbean, 2009-2019
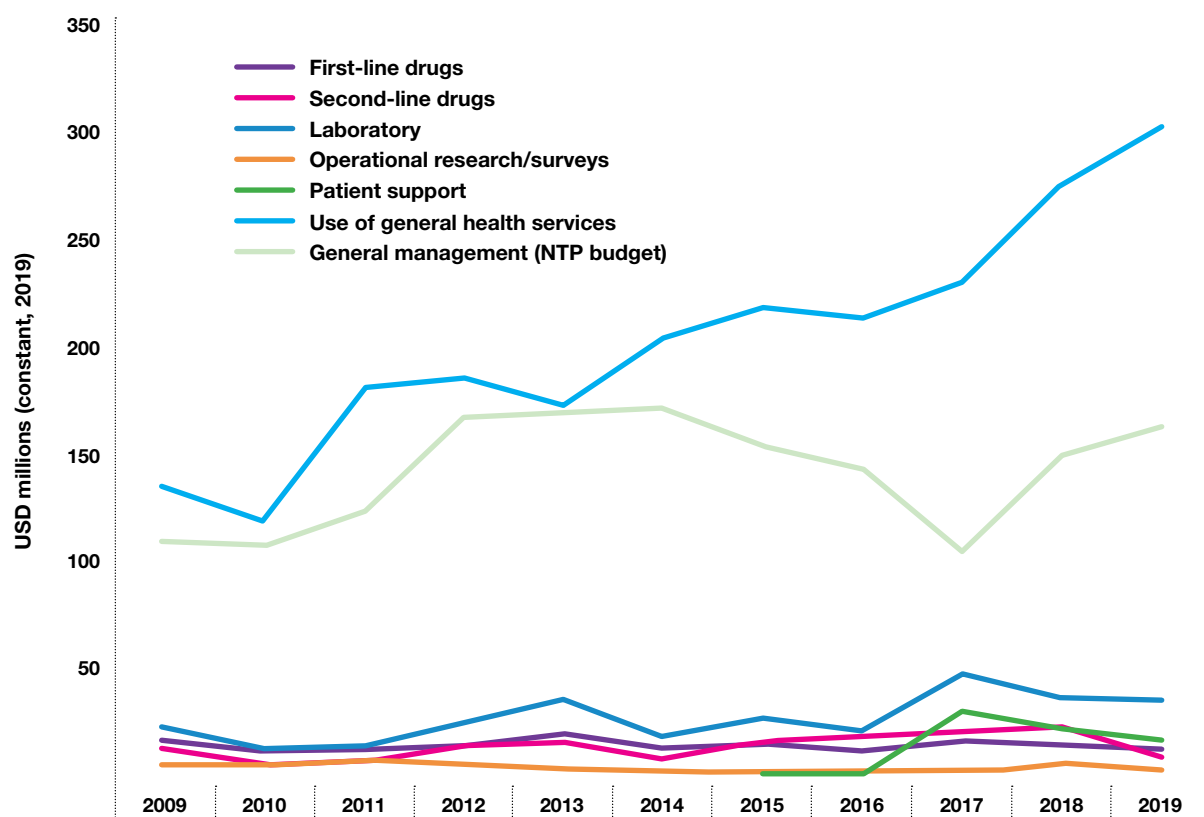
The rising trend in available funds for use of general health services (outpatient and inpatient care) reflects the growing volume of patients treated in the Region. Since 2013, governments have doubled funding for direct patient care.

The funds available for laboratory activities have remained constant over the years, with the exception of a peak in 2017, reflecting new investments in Peru. The absence of growth in laboratory investment is striking, especially considering that the importance of investing in laboratories to improve and achieve TB treatment targets.

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25 The "general management" budget line item includes funding for NTP staff, general NTP management of drug-susceptible and multidrug-resistant patients (e.g., supervision, training, rent, construction, real estate), and TB/HIV collaborative activities..

Collection of data on patient support funds began in 2015. As of 2019, USD 16 million was reported to be available in these 11 countries. Peru accounted for most of this budget. The main examples of patient support costs are transport allowances and nutritional support.

Fifteen countries in the Region have a low incidence of TB and are on track for elimination. Only the United States of America regularly reports data on funds for TB control. Its annual budget is USD 15,000 per patient.

TB spending reflects the amount already disbursed for each program and would therefore serve as a better indicator of the availability of TB funds. Data on TB spending in the Region is still difficult to consolidate and collect, which makes its analysis impossible. Nevertheless, there is an established methodology for measurement, which countries such as El Salvador have implemented (Box 9.2)[26].

Box 9.2. **El Salvador's experience with measuring expenditure on tuberculosis**

There are more accurate and comprehensive measurements of States' investment in specific health areas. Measuring public expenditure on TB in El Salvador is one example of research to determine the investments that different entities contribute to the care of TB patients.

The results of this study show that the country invests about 1% of its public health expenditure on TB, which corresponds to a per-capita investment of US$ 4,175 per year. The country also reports that 72% of TB spending was shouldered by the Ministry of Health (including Global Fund funds and PAHO spot contributions), another 20% by the Salvadoran Social Security Institute (ISSS), and the remaining 8% by other public sources, such as the prison system and military health. It is also worth noting that spending is mainly concentrated on outpatient and inpatient care.

Per capita public expenditure on TB, El Salvador (USD, 2015)
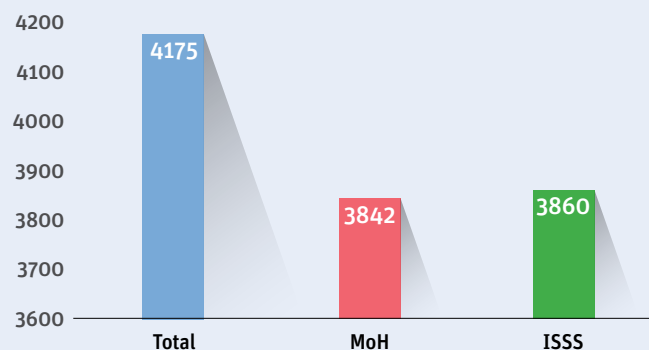
This type of study allows in-depth analysis of the entire financial system as it applies to health. Not only does it help understand the role of different actors in the industry, but it also provides input for resource planning in subsequent years.

26 Ministry of Health of El Salvador. Medición del gasto público en tuberculosis en El Salvador, año 2015 (MEGA TB, 2015). San Salvador: Ministerio de Salud; 2015 (in Spanish).

9.4 Funding gap

In 2019, the funding gap was equivalent to 10% of NTP budgets and amounted to USD 26 million in the 11 countries with the highest TB burden (Figure 9.5). Five of these 11 countries – Argentina, Bolivia (Plurinational State of), Brazil, El Salvador, and Mexico – reported having no funding gap in 2019. In the other six countries, the funding gap in 2019 ranged from USD 400,000 and USD 12 million, equivalent to 10% and 36% of budgets, respectively.

Figure 9.5. Funding gap by budget line item, 11 countries with the highest TB burden, 2013-2019
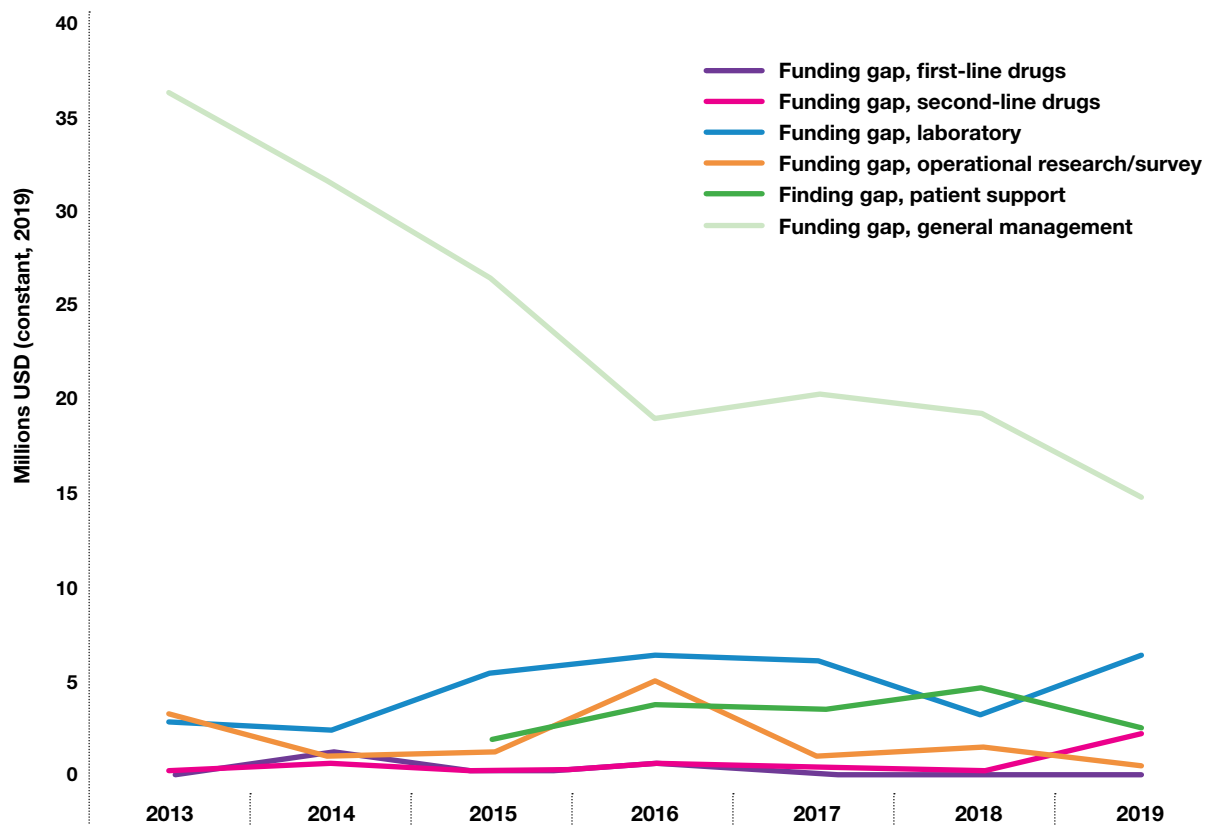
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

Figure 9.6. Funding gap as percentage of budget, by budget line item, 11 countries with the highest TB burden, 2013-2019
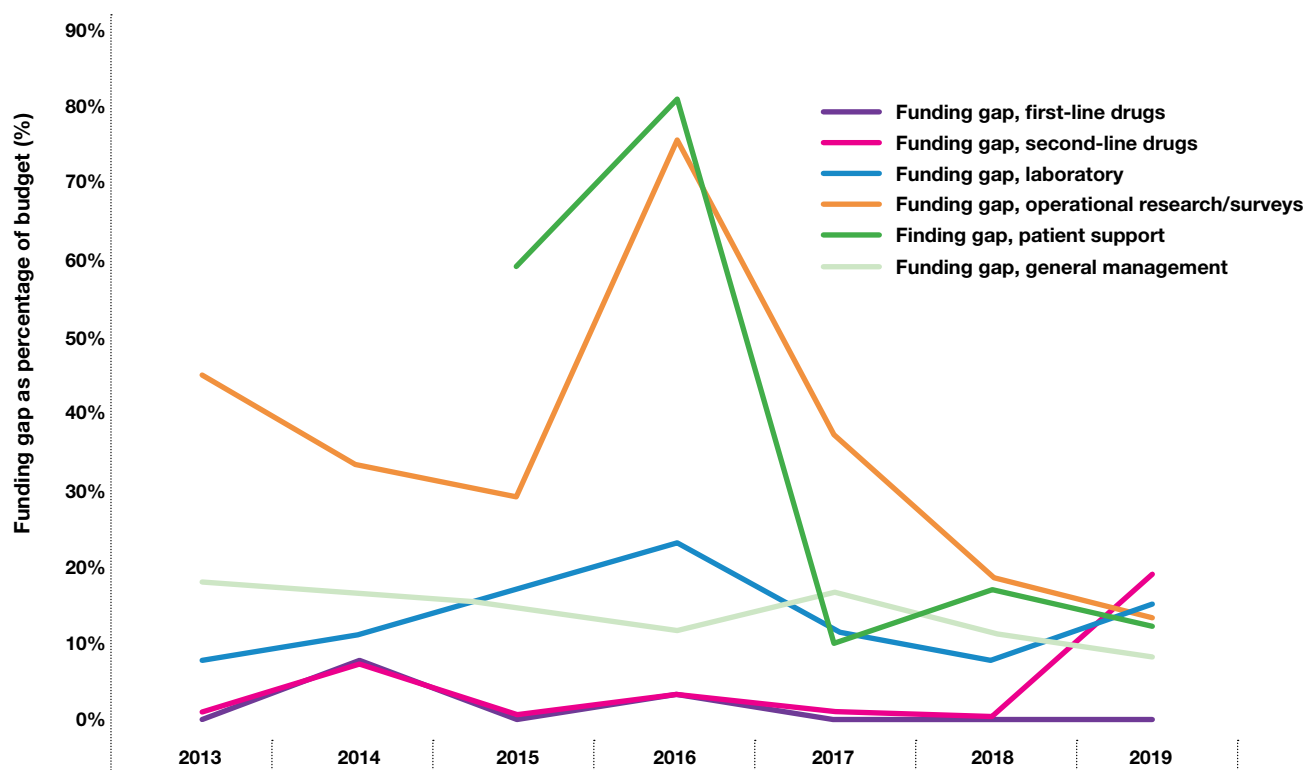
Source: World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from: https://www.who.int/tb/publications/global_report/en/.

General NTP management is associated with the largest gap in absolute terms in any year (Figure 9.5). In 2019, this funding gap reached USD 14 million. The relative importance of funding gaps is seen when they are analyzed as a percentage of the budget. The funding gap for general management corresponds to 8% of the budget (Figure 9.6), in contrast to the funding gap for second-line drugs, which corresponds to 19% of the budget in 2019.

In five of the moderate-burden countries for which data are available (Belize, Honduras, Nicaragua, Paraguay, and Suriname), the funding gap ranged from 0% to 76% of the NTP budget in 2019. It is striking that countries such as Chile (a high-income country) and Paraguay (an upper middle-income country) reported funding gaps of nearly 90% and 80%, respectively (Table 9.1).

In the 11 countries with the highest TB burden, the funding gap corresponds to 10% of budgets overall. The shortfall mainly affects program management and laboratory activities.

9.5 Additional available funds

The Region also has access to funds managed by supranational organizations, which benefit all NTPs and patients. Although countries do not report these funds to WHO, they are part of the funding available in the Region. In 2019, the Region received supplementary funding to support various areas of action (Box 9.3).

Box 9.3. Funds managed by supranational organizations in the Region of the Americas, 2019

Area of action	Source and executor	Beneficiaries
Strengthening of TB laboratory networks	Global Fund regional grant implemented by ORAS, SE-COMISCA, and PAHO	Argentina, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay, and Venezuela (Bolivarian Republic of).
Strengthening NTP capacities, addressing vulnerable populations, and supporting innovative initiatives	USAID grant implemented by PAHO	USAID beneficiary countries
Strengthening the prevention and control of drug-resistant TB	Contributions from Global Fund national grants, implemented by PAHO and RGLC	Countries receiving national grants from the Global Fund
Specific regional activities (e.g., regional meetings of program managers)	PAHO WHO	All countries

Global Fund: Global Fund to Fight AIDS, TB and Malaria; TB: tuberculosis; WHO: World Health Organization; PAHO: Pan American Health Organization; ORAS: Andean Health Organization; NTP: national TB programs; rGLC: Regional Green Light Committee; SE-COMISCA: Executive Secretary for the Council of Ministers of Health of Central America and the Dominican Republic; USAID: United States Agency for International Development.

Methodological note

A trend analysis of financial data for a country requires that the country have reported financial data consecutively at least since 2010 and that it is not be classified as a high-income country by the World Bank. Twenty-one countries in the Region of the Americas meet these requirements and are included in global TB reports and this regional report.[27] This financial report focuses on trend analysis of the 12 countries with the highest incidence burden: Argentina, Bolivia (Plurinational State of), Brazil, Colombia, the Dominican Republic, El Salvador, Guyana, Haiti, Mexico, Panama, Peru, and Venezuela (Bolivarian Republic of). Other countries may be included in some analyses; this is always specified. When the analysis or presentation of data refers to a single year, all countries reporting data for that year are included, except for the United States of America, as the large amount of its budget distorts data from other countries.

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27 World Health Organization. Global tuberculosis report 2019. Geneva: WHO; 2019. Available from:
    https://www.who.int/tb/publications/global_report/en/.

10 Annexes

Annex **1** Key indicators of the End TB Strategy for the Region of the Americas, 2018

Table A1.1. Key indicators of the End TB Strategy for the Region of the Americas

Indicator		2018 values (%)	Target for 2025 (%)
TB treatment coverage		81	≥90
Treatment success rate	New and relapse cases (2017)	76	≥90
	RR/MDR-TB (2016)	59	
TB-affected families facing catastrophic costs due to TB		N/A	0
New and relapse TB patients tested using a WHO-recommended rapid diagnostic at the time of diagnosis		18	≥90
LTBI treatment coverage	Children under 5	56	≥90
	HIV	9	≥90
Contact tracing coverage		N/A	≥90
DST coverage for TB patients		35	100
Treatment coverage, new TB drugs		N/A	≥90
Documentation of HIV status among TB patients		82	100
TB case fatality rate (2017)		8	≤5

N/A: not available; LTBI: latent tuberculosis infection; DST: drug susceptibility testing; MDR-TB: multidrug-resistant tuberculosis; RR-TB: rifampicin-resistant tuberculosis; HIV: human immunodeficiency virus.

Annex **2** Key indicators of the End TB Strategy for the countries of the Americas, 2018

Table A2.1. Key indicators of the End TB Strategy for the countries of the Americas, 2018

Country	TB treatment coverage (%)	Treatment success rate		New TB patients tested using a WHO-recommended rapid diagnostic at the time of diagnosis (%)	LTBI treatment coverage (%)		DST coverage for TB patients (%)	Documen-tation of HIV status among TB patients	TB case fatality rate
		New and relapse	MDR/RR-TB		Children under 5	HIV			
	2018	2017	2016	2018	2018	2018	2018	2018	2017
Antigua and Barbuda	83.3	100.0	No cases	–	–	8.3	0.0	100.0	–
Argentina	86.0	56.8	31.6	1.3	–	–	22.5	25.5	5.9
Aruba	83.3	–	–	–	–	–	–	–	–
Bahamas	87.0	70.6	100.0	–	–	–	38.3	95.7	–
Barbados	100.0	No cases	No cases	100.0	–	0.0	100.0	0.0	–
Belize	90.0	70.9	No cases	57.6	28.6	–	54.8	96.0	–
Bolivia (Plurinational State of)	63.3	82.7	60.0	18.7	–	–	57.2	86.0	–
Brazil	86.7	71.0	61.2	33.7	–	–	35.3	78.9	7.0
Canada	85.5	80.3	–	–	–	–	72.6	66.9	5.0
Chile	86.7	78.1	71.4	8.2	–	4.6	67.0	85.1	13.7
Colombia	81.4	72.6	50.6	15.6	–	0.9	16.3	91.3	8.2
Costa Rica	80.2	91.8	33.3	0.0	–	–	76.5	94.5	9.1
Cuba	86.6	81.6	33.3	37.5	–	74.3	56.3	100.0	5.9
Curaçao	–	–	–	–	–	–	–	–	–
Dominica	80.0	100.0	No cases	–	–	–	0.0	50.0	–
Dominican Republic	80.4	74.3	52.3	6.6	100.0	28.3	16.9	86.2	–
Ecuador	80.5	74.0	54.8	–	60.3	4.8	18.8	82.6	8.3
El Salvador	80.3	90.5	100.0	52.3	–	72.9	52.2	99.1	–
Grenada	100.0	66.7	No cases	0.0	–	0.0	0.0	50.0	0.0
Guatemala	79.3	87.4	51.9	19.5	52.8	10.7	23.2	99.3	7.8
Guyana	80.6	70.9	60.0	72.5	–	42.6	71.2	87.4	–
Haiti	66.9	77.6	81.7	35.5	–	–	36.0	92.3	–
Honduras	81.1	87.0	70.0	3.5	–	57.7	34.8	98.1	–

Country	TB treatment coverage (%)	Treatment success rate		New TB patients tested using a WHO-recommended rapid diagnostic at the time of diagnosis (%)	LTBI treatment coverage (%)		DST coverage for TB patients (%)	Documen-tation of HIV status among TB patients	TB case fatality rate
		New and relapse	MDR/RR-TB		Children under 5	HIV			
	2018	2017	2016	2018	2018	2018	2018	2018	2017
Jamaica	80.2	26.6	No cases	68.1	–	–	68.1	63.8	–
Mexico	80.2	76.9	67.5	0.1	55.8	1.0	6.8	89.0	9.1
Nicaragua	81.1	86.2	–	3.5	–	30.9	50.9	93.7	5.5
Panama	78.3	72.9	35.0	48.8	77.8	26.2	45.8	99.0	12.2
Paraguay	86.3	71.3	53.8	22.3	47.3	13.7	25.2	86.0	7.3
Peru	80.6	86.2	59.5	2.5	96.0	9.0	58.8	93.8	4.4
Puerto Rico	86.2	69.2	No cases	44.0	–	–	67.9	92.0	11.1
Saint Kitts and Nevis	No cases	0.0	No cases	No cases	No cases	No cases	No cases	No cases	–
Saint Lucia	83.3	90.9	No cases	100.0	–	0.0	100.0	100.0	–
St. Maarten	87.5	100.0	No cases	–	–	–	0.0	0.0	–
St. Vincent and the Grenadines	85.7	66.7	–	100.0	–	–	100.0	100.0	–
Suriname	79.1	72.9	No cases	66.1	–	–	66.5	96.6	–
Trinidad and Tobago	87.2	66.5	No cases	63.2	–	–	63.2	96.8	–
United States of America	87.4	76.7	69.4	–	–	–	72.4	87.2	5.6
Uruguay	83.5	72.5	66.7	22.8	92.2	11.4	65.4	94.8	6.7
Venezuela (Bolivarian Republic of)	78.7	81.7	71.9	0.0	14.4	2.3	5.5	58.0	–
Region of the Americas	**81.4**	**75.6**	**59.1**	**18.2**	**56.1**	**9.3**	**35.2**	**82.2**	**8**

DST: drug susceptibility testing; LTBI: latent TB infection: TB: tuberculosis; MDR-TB: multidrug-resistant tuberculosis; RR-TB: rifampicin-resistant tuberculosis; HIV: human immunodeficiency virus.

Note: The data presented correspond to a cutoff date of November 2019. Information is lacking for the following three key indicators: percentage of TB-affected families facing catastrophic TB costs, contact research coverage, and treatment coverage with new TB drugs.

Annex **3** National diagnostics policies and laboratory quality indicators for the Region of the Americas

Table A3.1. National policies to increase access to rapid TB testing and drug susceptibility testing, Region of the Americas, 2018

Country	National policy and diagnostic algorithm mandate rapid testing for initial diagnosis of TB	New and relapse cases diagnosed by rapid testing			National policy and diagnostic algorithm mandate universal access to DST	DST								
						New cases			Retreated cases (including relapses)			RR/MDR-TB cases undergoing second-line DST		
		Number of notified cases	Number of tests performed	%		Notified cases	DST performed	%	Notified cases	DST performed	%	Notified cases	DST performed	%
Antigua and Barbuda	N/A	5	N/A	N/A	N/A	4	0	0.0	2	0	0.0	0	0	N/A
Argentina	No	10 320	131	1.3	No	9778	2078	21.3	1 739	513	29.5	174	120	69.0
Aruba	N/A	5	N/A	N/A	N/A	5	0	0.0	0	N/A	N/A	N/A	N/A	N/A
Bahamas	No	47	N/A	N/A	Yes	46	18	39.1	1	0	0.0	1	0	0.0
Barbados	Yes	1	1	100.0	Yes	1	1	100.0	0	0	N/A	0	0	N/A
Belize	Yes	99	57	57.6	Yes	91	55	60.4	13	2	15.4	0	0	N/A
Bolivia (Plurinational State of)	Yes	7 597	1 423	18.7	Yes	7257	3935	54.2	498	498	100.0	110	62	56.4
Brazil	Yes	82 409	27 801	33.7	Yes	75 677	25 490	33.7	14 850	6 511	43.8	1 119	141	12.6
Canada	Yes	1 796	N/A	N/A	Yes	1 698	1 242	73.1	98	61	62.2	25	18	72.0
Chile	No	2 947	241	8.2	Yes	2 797	1 870	66.9	253	174	68.8	62	37	59.7
Colombia	No	13 025	2 034	15.6	No	12 430	2 155	17.3	1 326	91	6.9	205	69	33.7
Costa Rica	No	401	0	0.0	Yes	384	312	81.3	24	0	0.0	7	7	100.0
Cuba	No	710	266	37.5	Yes	651	349	53.6	98	73	74.5	28	22	78.6
Dominica	No	4	N/A	N/A	Yes	3	0	0.0	1	0	0.0	0	0	N/A
Dominican Republic	No	3857	253	6.6	Yes	3 476	501	14.4	648	196	30.2	100	82	82.0
Ecuador	Yes	5 960	N/A	N/A	Yes	5 817	1 145	19.7	277	N/A	N/A	252	252	100.0
El Salvador	No	3 615	1 890	52.3	No	3 256	1 621	49.8	368	270	73.4	6	0	0.0
Grenada	Yes	2	0	0.0	Yes	1	0	0.0	1	0	0.0	0	0	N/A
Guatemala	No	3 568	696	19.5	Yes	3 397	732	21.5	226	108	47.8	57	4	7.0
Guyana	Yes	516	374	72.5	Yes	468	329	70.3	118	88	74.6	17	0	0.0
Haiti	Yes	13 383	4 749	35.5	Yes	12 648	4 373	34.6	1 065	564	53.0	94	87	92.6
Honduras	Yes	2 838	100	3.5	Yes	2 598	776	29.9	268	222	82.8	21	15	71.4
Jamaica	Yes	69	47	68.1	No	68	46	67.6	1	1	100.0	0	0	N/A
Mexico	No	23 271	12	0.1	No	22 133	1 083	4.9	1 963	548	27.9	298	246	82.6

Country	National policy and diagnostic algorithm mandate rapid testing for initial diagnosis of TB	New and relapse cases diagnosed by rapid testing			National policy and diagnostic algorithm mandate universal access to DST	DST								
						New cases			Retreated cases (including relapses)			RR/MDR-TB cases undergoing second-line DST		
		Number of notified cases	Number of tests performed	%		Notified cases	DST performed	%	Notified cases	DST performed	%	Notified cases	DST performed	%
Nicaragua	No	2 109	73	3.5	No	2 001	1 021	51.0	185	91	49.2	38	0	0.0
Panama	Yes	1 723	841	48.8	Yes	1 658	788	47.5	179	54	30.2	48	48	100.0
Paraguay	No	2 589	578	22.3	Yes	2 404	528	22.0	418	184	44.0	17	7	41.2
Peru	Yes	31 421	791	2.5	Yes	28 484	16 335	57.3	4 158	2 867	69.0	1 942	787	40.5
Puerto Rico	No	25	11	44.0	Yes	25	17	68.0	3	2	66.7	0	0	N/A
Saint Lucia	Yes	5	5	100.0	Yes	5	5	100.0	0	0	N/A	0	0	N/A
St. Maarten	Yes	7	N/A	N/A	No	7	0	0.0	3	N/A	N/A	N/A	N/A	N/A
St. Vincent and the Grenadines	Yes	6	6	100.0	Yes	6	6	100.0	0	0	N/A	0	0	N/A
Suriname	Yes	174	115	66.1	Yes	165	110	66.7	14	9	N/A	13	0	0.0
Trinidad and Tobago	Yes	253	160	63.2	Yes	249	159	63.9	23	13	56.5	1	0	0.0
United States of America	N/A	8 561	N/A	N/A	Yes	8 561	6 233	72.8	416	269	64.7	111	87	78.4
Uruguay	No	1002	228	22.8	Yes	909	590	64.9	134	92	68.7	2	2	100.0
Venezuela (Bolivarian Republic of)	No	11 017	N/A	N/A	No	10 574	390	3.7	820	240	29.3	43	37	86.0
Region of the Americas		235 345	42 886	18.2		219 740	74 298	33.8	30 191	13 741	45.5	4 791	2 130	44.5

N/A: not available; DST: drug susceptibility testing; TB: tuberculosis; MDR-TB: multidrug-resistant tuberculosis, RR-TB: rifampicin-resistant tuberculosis.

Table A3.2. Quality of laboratory services in countries of the Region of the Americas, 2018

Country	ISO 15189 accreditation of the NRL	Percentage of sites participating in EQC in 2018		Percentage of sites participating in EQC (panels) in 2018			
		Sputum smear (%)	Xpert® MTB/ RIF tests (%)	First-line phenotypic DST (%)	First-line and second-line phenotypic DST (%)	LPA for rifampicin and isoniazide	LPA for first- and second-line drugs
Antigua and Barbuda	No	–	0	–	–	–	–
Argentina	No	26	44	71	67	100	100
Aruba	–	–	–	–	–	–	–
Bahamas	–	100	–	0	–	–	–
Barbados	No	100	100	–	–	–	–
Belize	No	17	100	–	–	–	–
Bolivia (Plurinational State of)	No	1	100	0	0	–	–
Brazil	Yes	22	2	48	100	–	–
Canada	Yes	–	–	0	–	–	–
Chile	Yes	85	100		100	–	100
Colombia	No	92	100	100	100	100	100
Costa Rica	Yes	100	100	100	100	100	100
Cuba	No	0	0	0	0	–	–
Curaçao	–	–	–	–	–	–	–
Dominica	No	100	–	–	–	–	–
Dominican Republic	No	72	0	100	100	–	–
Ecuador	No	–	–	0	0	–	–
El Salvador	No	100	100	100		–	–
Grenada	–	100	100			–	–
Guatemala	No	87	71	0	100	–	0
Guyana	No	88	100	–	–	–	
Haiti	No	97	100	100	100	100	100
Honduras	No	89	100	100	0	–	–
Jamaica	–	100	100	100		–	–
Mexico	Yes	58	0	0	50	–	33
Nicaragua	No	100	100	–	–	–	
Panama	Yes	98	91	100	100	50	100
Paraguay	No	80	100	100	0	–	–

Country	ISO 15189 accreditation of the NRL	Percentage of sites participating in EQC in 2018		Percentage of sites participating in EQC (panels) in 2018			
		Sputum smear (%)	Xpert® MTB/ RIF tests (%)	First-line phenotypic DST (%)	First-line and second-line phenotypic DST (%)	LPA for rifampicin and isoniazide	LPA for first- and second- line drugs
Peru	No	80	0	100	100	100	100
Puerto Rico	Yes	100	100	100	–	100	
Saint Kitts and Nevis	–	100	–	–	–	–	–
St. Maarten	–	–	–	–	–	–	–
St. Vincent and the Grenadines	No	100	100	100	–	100	
Saint Lucia	No	100	0	–	–	–	–
Suriname	Yes	0	0	–	–	–	–
Trinidad and Tobago	No	33	–	–	–	–	–
United States of America	No	–	–	100	100	–	–
Uruguay	No	0	17	100	–	100	0
Venezuela (Bolivarian Republic of)	No	48	0	0	0	0	0
Region of the Americas		**57**	**36**	**67**	**74**	**89**	**60**

EQC: external quality control; NRL: national reference laboratory; LPA: line probe assay; DST: drug susceptibility testing.

Tuberculosis is one of the ten leading causes of death worldwide, and still represents a major public health problem in the Region of the Americas. The Region has made great strides in TB prevention and control; nevertheless, at the current rate of decline in the number of TB deaths and incidence of TB, the proposed targets and milestones needed to end TB will not be achieved. Countries must thus ramp up their efforts to meet these targets.

Tuberculosis in the Americas: Regional Report presents the situation of tuberculosis in the Region, as well as the progress made by countries in the prevention, diagnosis, treatment, and elimination of TB under the framework of the End TB Strategy, the Sustainable Development Goals, and the commitments made at the high-level TB meeting of the United Nations General Assembly in 2018. Epidemiological analyses and programmatic data provide an overview of the TB situation in the Region, with emphasis on case detection, preventive treatment, treatment outcomes, drug-resistant TB, TB/HIV co-infection, and vulnerable groups, among other aspects. An analysis of TB funding in the Region is also included.

The authors hope that this report will facilitate understanding of the situation of TB in the Region and serve as an example for similar country-level analyses, with a view to promoting better decision-making and ending TB.