



## Eliminating tuberculosis in Latin America: making it the point

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In 2015, the World Health Organization (WHO) launched the End TB strategy, which has three pillars—integrated, patient-centered care and prevention; bold policies and supportive systems; and intensified research and innovation—and has the inbuilt concept of the elimination of tuberculosis.<sup>(1-4)</sup> The elimination of tuberculosis has been defined as < 1 case per million population, pre-elimination having been defined as < 10 cases per million. Since then, the three pillars have been officially adopted by a number of countries<sup>(5)</sup>: in 2015, by Brazil, Ethiopia, the Russian Federation, South Africa, and Vietnam; and in 2016, by India, Indonesia, Swaziland, and Thailand.

Following a joint WHO/European Respiratory Society (ERS) consultation with countries with a low incidence of tuberculosis (< 10 cases per 100,000 population), held in Rome in 2014, the WHO launched its *Framework Towards Tuberculosis Elimination In Low-Incidence Countries*.<sup>(4)</sup> The document identified eight major areas to be tackled in order to eliminate tuberculosis in such countries.<sup>(4)</sup>

In epidemiological terms, tuberculosis control strategies focus on the early identification and effective treatment of cases of infectious tuberculosis (to break the chain of transmission and reduce the incidence); tuberculosis elimination is an additional strategy which has at its core the identification of latently infected individuals and their treatment (to sterilize the “reservoir” of infected persons and ensure future generations of infection-free individuals),<sup>(1,6,7)</sup> investing today to prevent tuberculosis cases tomorrow.<sup>(1,6,7)</sup> There is evidence that, when applied consistently, the tuberculosis elimination strategy has been effective. For example, it has been reported to have reduced the incidence of tuberculosis by up to 17% per year in Inuit populations.<sup>(8)</sup>

An initial question to be answered is whether there have been any reports of experiences with the tuberculosis elimination strategy in high-burden countries. Recent studies conducted in the countries of Cyprus and Oman have shown that the appropriate implementation of the basic elements of the End TB strategy can drive the epidemiology of tuberculosis toward the pre-elimination threshold.<sup>(9,10)</sup> A second question is to what extent the

tuberculosis elimination strategy can be applied in Latin America and the Caribbean, where there are a number of low-incidence countries—including the Bahamas, Chile, Costa Rica, Cuba, the Dominican Republic, Jamaica, and Puerto Rico, as well as Trinidad and Tobago—and others that are approaching that threshold—including Brazil, Uruguay, and Colombia—those in the latter category also having been invited to the WHO/ERS technical consultation in Rome in 2014.

In parallel with the publication of the WHO framework,<sup>(4)</sup> the Pan American Health Organization (PAHO) created two important documents. In 2015, the organization issued a document including all three pillars of the End TB strategy, the *PAHO Strategic Plan*,<sup>(11)</sup> which followed its *Action Plan for the Prevention and Control of Tuberculosis*. Launched in 2013, the PAHO action plan focused on tuberculosis control only, using epidemiological indicators (i.e., increased numbers of patients with bacteriologically confirmed tuberculosis that was treated successfully), promoting cross-cutting approaches in health, and covering comorbidities (e.g., HIV infection and mental health disorders).<sup>(12)</sup> Those documents were followed by the *Roadmap for Tuberculosis Elimination in Latin America and the Caribbean*, created jointly by the ERS and the *Asociación Latinoamericana del Tórax* (ALAT, Latin-American Thoracic Society), to guide national tuberculosis programs toward implementation of the PAHO strategies. It is clear that there is considerable heterogeneity in Latin America in terms of epidemiological actions and programs, the strategic goals mentioned above therefore being met at different paces.<sup>(3,4)</sup> One example is provided by the epidemiology of tuberculosis in Mexico (Figure 1), where the reported incidence of the disease is below the low-incidence threshold in one third of the states, < 20 per 100,000 population in another third, and higher than that in the remaining third.

In 2017, the Brazilian National Ministry of Health issued a document aimed at the elimination of tuberculosis, the *National Plan to End Tuberculosis as a Public Health Problem*. The plan was designed with the goal of reducing tuberculosis incidence (to < 10 cases/100,000 population)

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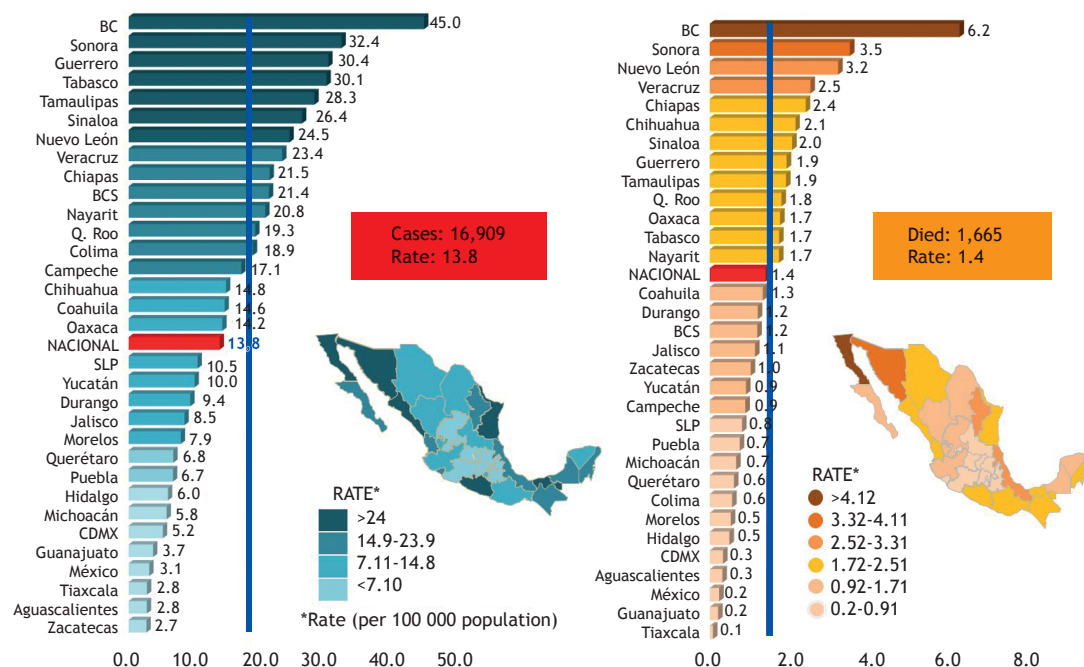
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**Figure 1.** Incidence of reported cases of pulmonary tuberculosis and associated mortality in Mexico (per 100,000 population in 2016 and 2015, respectively), by state. Obtained from the Mexican Ministry of Health.

and mortality (to < 1 death/100,000 population) by 2035, defining the approaches to implementing each of the three pillars of the WHO End TB strategy.<sup>(13)</sup>

In Latin America, visible progress has been made toward meeting the goals set for tuberculosis incidence, prevalence, and mortality.<sup>(3,4)</sup> Among the remarkable successes achieved are increased detection rates, improved laboratory quality assurance, better systematic management of cases of multidrug-resistant tuberculosis (MDR-TB), and the promotion of community involvement, as well as coordination of technical and financial partners.<sup>(3,4)</sup>

Although there has been a decrease in the reported number of new cases in Brazil, that decrease has been modest (only 1.5% per year) and more needs to be done to improve treatment outcomes, reduce losses to follow-up, and prevent the emergence of MDR-TB.<sup>(14)</sup> Clearly, there is a need for political commitment (with adequate funding and legal framework), true patient-centered care, and attention to comorbidities, as well as the control of risk factors such as diabetes, HIV infection, illicit drug use, smoking, and mental disorders.<sup>(15)</sup> Special attention should also be given to vulnerable groups (e.g., migrants from rural areas to large cities, south-south migrants (i.e., migrants between developing countries), people living in slums, underserved indigenous populations, homeless individuals, and prisoners).<sup>(16)</sup>

The eight core areas identified in the ERS/ALAT Roadmap for Tuberculosis Elimination in Latin America and the Caribbean provide a clear guide to reaching the tuberculosis elimination targets in the region:

1. identifying and supporting vulnerable populations

2. addressing migration and transborder issues
3. strengthening operational research, channeling it through agreed-upon national research plans prioritized by national tuberculosis research networks and adequately funded to tackle the intensified research/innovation pillar of the End TB strategy
4. fostering political commitment for tuberculosis care and prevention in order to implement elements of the bold policies/supportive systems pillar of the End TB strategy
5. adapting the strategy at the national and regional level while promoting global collaboration
6. enhancing active detection and treatment of latent tuberculosis infection, as well as active tuberculosis, according to the principles of tuberculosis elimination<sup>(5,17)</sup>
7. ensuring early, high-quality treatment of cases of drug-resistant tuberculosis and MDR-TB while ensuring universal drug-susceptibility testing with conventional and/or new molecular methods and availability of the necessary second-line drugs (in order to tackle, with core area 1, the actions included in the integrated, patient-centered care/prevention pillar of the End TB strategy
8. improving continuous surveillance, monitoring, and evaluating activities to assess the progress toward the planned targets and the elimination of tuberculosis

Indicators for the monitoring and evaluation of each of those components were also proposed (Table 1).<sup>(3,4)</sup>

The contribution of tuberculosis research networks, as proposed by the WHO in 2015, is key to working in accordance with regional priorities.<sup>(18)</sup> The joint ERS/ALAT/Brazilian Thoracic Society tuberculosis project and the Brazilian Tuberculosis Research Network are

**Table 1.** Indicators of the impact and implementation of the World Health Organization End TB strategy for Latin American and Caribbean countries.

Impact indicators	Milestones		Targets	
	2020	2025	2030 <sup>a</sup>	2035 <sup>b</sup>
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%
Families facing catastrophic costs due to TB	0%	0%	0%	0%
Implementation indicators	Recommended target level			
TB treatment coverage	≥ 90%			
TB treatment success rate	≥ 90%			
Households that experience catastrophic costs due to TB	0%			
Newly reported TB cases diagnosed using WHO recommended rapid tests	≥ 90%			
Latent TB infection treatment coverage	≥ 90%			
Contact investigation coverage	≥ 90%			
Drug susceptibility coverage for TB patients	100%			
Treatment coverage, new TB drugs	≥ 90%			
Documentation of HIV status among TB patients	≥ 90%			
Case fatality ratio	≤ 5%			
Availability of the planned budget for TB	100%			
Implementation of planned monitoring and evaluation activities	100%			

TB: tuberculosis; and WHO: World Health Organization. <sup>a</sup>Sustainable development goals. <sup>b</sup>World Health Organization End TB strategy targets.

making significant contributions by generating the evidence necessary for successful implementation of the tuberculosis elimination strategy.<sup>(19)</sup> Some of the

preliminary results are quite encouraging,<sup>(20-35)</sup> showing how important it is to implement all three pillars of the WHO End TB strategy in Latin America.

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