Increasing tuberculosis burden in Latin America: an alarming trend for global control efforts

Otavio T Ranzani ![ORCID],[1,2] Julia M Pescarini,[3,4] Leonardo Martinez,[5] Alberto L Garcia-Basteiro[6,7]

Correspondence to
Dr Otavio T Ranzani;
otavio.ranzani@isglobal.org

'Of concern is the WHO Region of the Americas, where incidence is estimated to be slowly increasing after many years of decline, owing to an upward trend in Brazil during 2016–2019.'—2020 Global TB report.

On the 24 March, we will commemorate the World TB Day. Despite important achievements on tuberculosis (TB) control summarised in the 2020 WHO Global TB report,[1] the above quotation referring to the WHO Region of the Americas is concerning. In contrast with global decreases in TB incidence rates over the past decade, in 2019, the Region of the Americas has taken a step backwards and the TB incidence rate has shown an unexpected upturn in recent years (online supplemental efigure-1 in the supplemental file).

The Region of the Americas comprises 46 countries and territories and Brazil and Peru are among the WHO high-TB burden countries. To illustrate the recent increase in TB incidence in the region, we selected 12 countries from Latin America (Argentina, Brazil, Chile, Colombia, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, Uruguay and Venezuela), which account for approximately 80% of the total estimated TB cases in the region. Using data from WHO TB databases (exported on 22 October 2020), we show that, between 2014 and 2019, the estimated TB incidence rate increased from 38.4 to 41.7 per 100 000 (8.6% relative increase) and the estimated number of incident cases increased from 202 290 to 230 100 (27 810 more cases, 13.8% relative increase) for these 12 countries (figure 1, for the same data in separated panels by each country, please see online supplemental eFigure-2 in the supplemental file).

This worrying scenario, in the context of elimination strategies in other continents, should not go unnoticed without clear action.

Several factors may play a role in this resurgence. In recent years, Latin America is facing economic, social and political crises, increasing population vulnerabilities to acquire and progress to TB disease in several ways. TB is, unfortunately, a marker of social inequity and the paradigm of poverty-related diseases; with the most vulnerable populations typically enduring the highest burden.[1] In Latin America, poverty has decreased from 230 million (45.4%) to 164 million persons (27.8%) between 2002 and 2014. However, since 2015, poverty has begun to increase, reaching 191 million (30.8%) in 2019, an additional of 27 million persons returning to poverty compared with 2014.[2] Venezuela and Brazil were the main drivers of these increases. In addition, other indicators of vulnerability have also surged: more than 4 million residents from Venezuela have migrated to neighbouring countries since 2014.[3] Furthermore, the number of persons experiencing homelessness has doubled from 2012 to 2019 in Brazil.[4] Finally, incarcerated prison populations have increased by 206% across Central and South America between 2000 and 2018.[5 6]

Venezuela has seen the most dramatic upward trend in TB incidence, almost doubling from 26.6/100 000 in 2014 to 45.6/100 000 in 2019 (figure 1). In Argentina, incidence rates declined from 38.0/100 000 in 2000 to 20.5/100 000 in 2010, but the country's progress has receded and experienced a 41.5% relative increase from 2010 to 2019 (29.0/100 000 on 2019). Uruguay also shows a continuous increase in TB incidence rate since 2007. In Brazil, the estimated incidence increased from 42.9/100 000 in 2014 to 45.5/100 000 in 2019 (6·1% relative increase), representing approximately 9000 additional incident cases.

National Tuberculosis Programmes, the Pan American Health Organization, and other national and international institutions
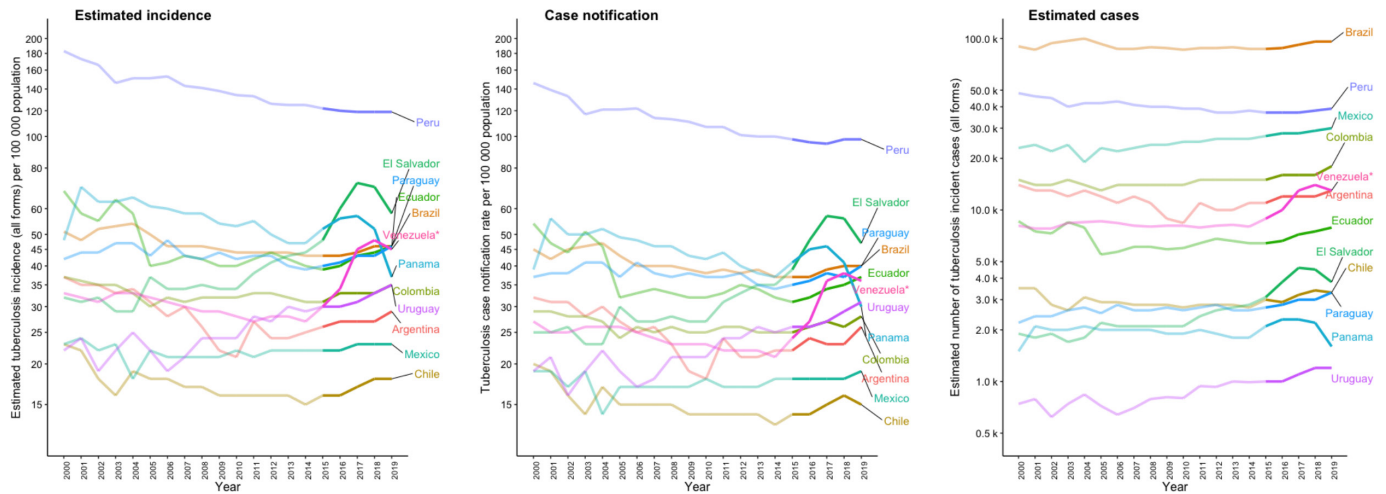
Figure 1 Estimated incidence rate, case notification rate and estimated incident cases of tuberculosis for 12 countries in Latin America between 2000 and 2019. Data generated from the tuberculosis WHO most updated database, exported on 22 October 2020. *Venezuela stands for Bolivarian Republic of Venezuela.

have made a huge effort on TB control in Latin America. In recent years, several countries have become ineligible for certain international donors (eg, Global Fund), partially because of their socioeconomic development, but also because of recent TB control successes. Therefore, retaining investments in TB control in the region is critical.

A first step to mitigate the health impact of this recent trend is to disentangle its main drivers (table 1). It is likely this resurgence is due to multiple factors and should be within the framework of already known TB drivers.[1] Researchers, academics and National TB programmes should take advantage of TB morbidity and mortality surveillance to describe where recent increases

Table 1 A proposed framework for initial areas of research to understand and mitigate the recent increase of tuberculosis in Latin America

Area	Questions	Actors
Theoretical	What are the actions and pathways responsible for the recent increase of TB in Latin America?	► To establish theoretical models aiming to explain the phenomenon, describe the complex interactions and support the analysis of causal research questions
Descriptive	When, where and how much is occurring the recent increase in TB incidence?	► To describe the time series of TB cases/incidence stratified by demographic features such as age and sex, regions and groups of interest ► To quantify the trend of the increased incidence in TB in relative (ie, growth rate) and absolute measures
Epidemiology	What are the main drivers of recent increase in TB incidence?	► To evaluate factors associated with the recent increase in TB using ecological data ► To quantify the contribution of factors on the relative increase of TB incidence using individual population data ► To estimate the population attributable fraction (PAF) of each factor associated with the TB increase and the combined risk factors (intersectional approach)
Modelling	In a complex scenario, what parameters could explain and mitigate the recent increase in TB incidence?	► To account for the several players and changes in the region, accounting for its heterogeneity, to explain the observed phenomena ► To simulate scenarios of potential interventions to mitigate the recent increase and return to the phase of decreasing incidence ► To evaluate cost-effective interventions in the short term and long term to mitigate the recent increase and return to the phase of decreasing incidence
Clinical trials and implementation	Does the intervention X could reduce incidence of TB in the region?	► To evaluate better strategies to implement and optimise already known interventions to reduce incidence of TB, taking account the particularities of Latin America ► To perform randomised interventions based on the main drivers aiming to reduce the incidence of TB, focusing on prevention of transmission, development of disease after infection and treatment ► Health impact evaluation of new implementations

TB, tuberculosis.

are occurring in terms of key demographic variables (eg, age and sex), geographical location within each country,[7] and stratified by main groups of interest, such as those with HIV infection and prisoners.[5–8] Additionally, studies with individual data, allowing for robust estimates of drivers on TB incidence in the region are needed. Other actions in the region should be considered because of their direct impact on improved diagnosis and notification of cases, such as roll out of platforms for molecular testing (GeneXpert), implementation of active contact tracing strategies and improved surveillance systems (quality and coverage).[8–10] Additionally, research and surveillance should aim to characterise TB transmission dynamics using molecular tools. The introduction of new lineages or resurgence of new strains in the region could be associated with increased transmission, while going unnoticed.[11] Finally, the use of modelling techniques may incorporate data on identified drivers associated with the observed upward trend in TB notifications in several Latin American countries, providing a better understanding and shedding light on mitigation opportunities.

The health and social impact of increasing TB burden in the region may be vast. Moreover, this worrying trend may by amplified by the impact of the current COVID-19 pandemic, which is expected to increase TB burden in the upcoming future. Irrespective of the negative impact of the COVID-19 pandemic in regional control efforts, TB is associated with considerable health burden not only on deaths and years of life lost, but also on comorbidities and subsequent quality of life during and after the TB episode.[1 12 13] Increased health demand caused by post-TB lung disease is expected.[13] Additionally, TB patients can experience exacerbation of previous chronic diseases, such as diabetes and chronic respiratory disorders. In this context, previous chronic diseases and recent sequelae from TB might have even worse treatment and control if we consider the catastrophic cost affecting patients and relatives that usually occurs during and after TB treatment. This scenario associated with the barriers to achieve universal health coverage in the region,[14] can be amplified by the ongoing socioeconomic crisis and implementation of austerity measures in some countries of Latin America.[15]

The need to act on a multifaceted platform to tackle the resurgence of TB in Latin America is now urgent. We expect additional challenges for health systems coping with the ongoing COVID-19 pandemic and its sequelae, which are likely to continue to impact TB care. TB control in the Americas is likely to worsen in upcoming years if remedial, coordinated actions are not urgently implemented to reverse these trends. Otherwise, years of thorough efforts in TB control will be lost.

Author affiliations
[1]Barcelona Institute for Global Health, ISGlobal, Universitat Pompeu Fabra, CIBER Epidemiología y Salud Pública, Barcelona, Spain
[2]Pulmonary Division, Heart Institute (InCor), Hospital das Clinicas HCFMUSP, Faculdade de Medicina, Universidade de Sao Paulo, Sao Paulo, Brazil
[3]Department of Infectious Disease Epidemiology, London School of Hygiene & Tropical Medicine, London, UK
[4]Centre for Data and Knowledge Integration for Health (CIDACS), Instituto Gonçalo Moniz, Fundação Oswaldo Cruz (FIOCRUZ), Salvador, Brazil
[5]Department of Epidemiology, School of Public Health, Boston University, Boston, Massachusetts, USA
[6]Barcelona Institute for Global Health, ISGlobal, Hospital Clínic-Universitat de Barcelona, Barcelona, Spain
[7]Centro de Investigação em Saúde de Manhiça (CISM), Maputo, Mozambique

Twitter Otavio T Ranzani @otavio_ranzani

ORCID iD
Otavio T Ranzani http://orcid.org/0000-0002-4677-6862

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