



Tuberculosis: a deadly and neglected disease in the COVID-19 era

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TO THE EDITOR,

In 1993, the World Health Organization (WHO) declared Tuberculosis (TB) a global emergency. Since then, few advances have been made in the control of the disease, such as molecular diagnostic tools and new treatment-shortening regimens, but the overall lack of progress is mainly due to inadequate investments in the Research & Development of new products and strategies for TB prevention, diagnosis, and treatment.¹

The United Nations' Sustainable Development Goals and the World Health Organization Global Plan to End TB state that funding for tuberculosis needs to approach the US\$2-billion target a year to end the disease by 2030. However, this goal has never been reached, as noted by the Treatment Action Group (TAG) in its recent investment report, with US\$772 million in 2017 coming the closest.²

In contrast, in 2020, the world faced a pandemic of enormous magnitude that changed the way we live our lives, substantially impacting global health and economic systems. Thus, the WHO declared COVID-19 a global health emergency within two months of the recognition of the first cases, and large economies quickly mobilized research funds to develop vaccines and drugs that could control the pandemic. The funding committed to combating COVID-19 exceeded US\$21.7 trillion, according to data analysis available on the Devex funding platform.³⁻⁵

Although there is a marked difference in the magnitude of investments between the two diseases, the number of deaths was similar in 2020: 1.5 million with TB (including 214,000 among people living with HIV) and 1.8 million with COVID-19, as reported by the WHO. The 2021 death tolls are still being calculated, though it is likely that an excess of deaths will be seen regarding both diseases due to the more transmissible and virulent SARS-CoV-2 variants and, in the case of TB, to the impact of COVID-19 on access to health services resulting in delays in diagnosis.^{6,7}

Thus, the discrepancy in funds that we are still facing is not related to the magnitude of the death toll in either disease but instead to where these deaths are occurring and which populations are affected. While COVID-19 has a widespread reach, affecting both rich and developing countries, TB remains a neglected disease, predominantly affecting the poorest countries and their more vulnerable populations.

In Brazil, as reported by TAG, funding for TB failed to reach 0.1% of the total allotted value for science and technology in all areas, which represents an

expected US\$35 million per year. Brazil invested only US\$1,196,598 in 2019. In 2020, this funding increased, reaching a total of US\$3,726,864, representing 11% of the US\$35 million target. In the Transparency Portal of the Brazilian government, the total amount invested in the past ten years in TB research was only a little more than US\$6 million.²

As demonstrated in Table 1, the amount provided for TB research in Brazil by the National Council for Scientific and Technological Development (CNPq), the main Brazilian research funding agency, was negligible. Most funding comes from financial management and agreement systems of the federal government (SICONV and GESCON). SICONV promotes financial transfers to states for the fulfillment of joint funding between CNPq and state research foundations, as well as parliamentary funds, while GESCON is the system that transfers funds to federal research institutions. It is possible that other transfers were not reported; however, Table 1 includes exactly what is informed and reported by the federal government.

On the other hand, funding for COVID-19 research in 2020, according to the Brazilian government, was in the order of US\$100 million, a number that is still far short of what is desired, given the magnitude of the pandemic.⁸

In an editorial by R. E. Chaisson, M. Frick, and P. Nahid, two major differences in the response to the two pandemics are notable, considering that *Mycobacterium tuberculosis* was first described in 1882 and SARS-CoV-2 in 2019. First, there are currently only 15 TB vaccine candidates in the pipeline compared to 112 vaccines for COVID-19, and we have only one licensed vaccine in use for TB, the BCG vaccine (which stands for Bacillus Calmette-Guérin vaccine), whereas there are 25 licensed vaccines for COVID-19. Second, only a total of US\$915 million was invested in TB research in 2020 compared to US\$104 billion for COVID-19 in the same period,⁹ i.e., 113 times more than the amount spent by all funders on TB research in 2020 (US\$915 million).

COVID-19 and tuberculosis are different diseases with distinct impacts on public health, demanding different actions from governments; however, it is also clear that, without appropriate investments, innovation for any disease control remains quite limited.

The lesson that can be learned from the rapid confrontation of the COVID-19 pandemic is that, with political will, the investments needed to control pandemic diseases can be achieved, as we are seeing around the

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Table 1. Amount invested in TB research from 2010 to 2020.

AGENCY	QUANT.	VALUE
CNPq	2	US\$78,364.88
GESCON	2	US\$199,874.00
SICONV	1	US\$3,134,600.08
PROADI/SUS	2	US\$31,689.80
UNODC	1	US\$16,800.00
TOTAL	8	US\$3,461,328.76
In progress	3	US\$3,166,290.64

Source: Brazilian Federal Government Transparency Portal. Consider 1 US dollar equals five Brazilian reais.

CNPq - National Council for Scientific and Technological Development

GESCON - Management System for Inquiries and Rules for Government Funds

SICONV - System for Budget Execution of Federal Government Funds for States and Municipalities

PROADI/SUS - Program to Support Institutional Development of the Unified Health System

UNODC - United Nations Office on Drugs and Crime

developed world. Since tuberculosis is a problem of different dimensions, especially for the countries that make up the BRICS bloc, it is essential that these countries that sustain the greatest burden contribute to accelerating their research and innovation capabilities.

In addition, investments in science should reduce the burden of disease on the most vulnerable populations, such as people living in slums, deprived of their liberty, co-infected with HIV/AIDS, indigenous people, and the homeless, who have a greater risk of developing TB, with the aim of reducing social inequalities.^{1,10}

Finally, we need to continue to fight for TB to be on the political agenda and to receive adequate funding, especially in the most burdened countries, such as Brazil, so that the goal of TB elimination can be achieved.

AUTHOR CONTRIBUTIONS

ELM, JEG, JRLS, and REC participated in the conception, planning, interpretation, and writing of this editorial letter. All authors approved the final version.

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