Tuberculosis and incarceration: uncovering the broader picture

Lancet Public Health 2024
Published Online
October 14, 2024
https://doi.org/10.1016/S2468-2667(24)00224-X
See Online/Articles
https://doi.org/10.1016/S2468-2667(24)00192-0

Understanding structural determinants is crucial in addressing tuberculosis, as these factors define the context in which the disease impacts populations. Incarceration has, in recent years, emerged as a major driver for tuberculosis in Latin America.[1,2] Although tuberculosis notification rates among the general population have remained stable, rates among people deprived of liberty have rapidly escalated in the region,[2] yet these account for only half of the actual burden.[3] However, focusing solely on tuberculosis among incarcerated individuals does not fully capture the broader impact of incarceration on the tuberculosis epidemic in Latin America.

In this issue of *The Lancet Public Health*, Yiran Liu and colleagues[4] evaluate the impact of mass incarceration as a driver of tuberculosis in Latin America and explicitly estimate its effects beyond prison walls on both formerly incarcerated individuals and the general population. To assess this effect, a transmission population attributable fraction (tPAF) was calculated using a transmission model that compares the wider effects of incarceration against a counterfactual scenario in which incarceration rates from 1990 remained unchanged.[4] The study estimates that in Latin America, the incarceration tPAF reached 27·2% in 2019; additionally, it shows that, in some countries, up to 45% of the excess incident tuberculosis could originate from those who have been formerly incarcerated.[4] These insights on this recently recognised structural determinant of tuberculosis provide valuable guidance for developing potential strategies to address the epidemic.

In exploring the broader context, Liu and colleagues draw attention to a high-risk group in the region.[4] Parallels can be drawn with the situation in South Africa, where a significant portion of tuberculosis incidence is attributed to a different driver: HIV.[5] HIV-specific interventions such as antiretroviral therapy (ART) not only had an impact on people living with HIV/AIDS but also benefitted the general population, as evidenced by the reductions in tuberculosis incidence among both people who were HIV positive and people who were HIV negative from 2003 to 2016.[6] Modelling studies further suggest that ART contributed to a notable 20% reduction in tuberculosis incidence in South Africa from 2000 to 2019.[7] These results and the similar level of double-digit PAFs between HIV in South Africa and incarceration in Latin American countries stresses the importance of targeting people deprived of liberty for intervention in this different context.

A key difference between HIV and incarceration as tuberculosis determinants is that although people deprived of liberty have a substantially reduced pool of contacts compared with the general population, they mix intensively within their group while in prisons.[2] This environment heightens the risk of *Mycobacterium tuberculosis* infection and progression to disease, increasing the likelihood that individuals will have or develop infectious disease after release, thereby extending the impact of incarceration beyond the prisons and into the surrounding communities.

Interventions to address this structural determinant could either be prison-specific or tuberculosis-specific. For the former, proposed interventions might focus on modifying incarceration policies, as explored in the current study evaluating the impact of reducing entries and durations of incarceration.[4] The goal is to reduce exposure to a hyperendemic environment where tuberculosis can easily propagate. Conversely, tuberculosis-specific interventions would aim to reduce tuberculosis within this environment, with the hope of improving the lives of people deprived of liberty and their immediate contacts outside. Mass screenings have been conducted in Brazilian prisons; however, their effects were strictly measured within confinement and did not account for the potential reductions in community transmission resulting from the additional yield of incident tuberculosis detected.[8] A substantial challenge in confronting this determinant is that it requires an intersectoral approach, where both health-care and justice systems need to be involved and committed to enacting changes. This approach might include facilitating access for conducting interventions in prisons, sharing records of incarceration history to allow for follow-up of formerly incarcerated individuals, and finding alternatives to reduce time in prisons while maintaining the judicial norms—functions that primarily

lie with the judicial system rather than the health-care sector. Additionally, the cost of interventions must be assessed to balance the apparent health and epidemiological benefits.

As such, the excellent work by Liu and colleagues highlights the need for further work in this area, including empirical data collection, policy engagement, and modelling to understand and balance the complexities and costs of interventions with the benefits for people deprived of liberty and beyond.[4] Although the potential and real challenges and obstacles are numerous, we should keep an eye on the broader picture. The rollout of ART seemed impossible to most at the start, but was done, with direct and wider benefit to tuberculosis rates on the African continent. A similarly worthwhile effort will be needed to address this key structural driver of tuberculosis in Latin America.

This work was supported by the National Institutes of Health (grant number R-202309-71190 to AS, LG, and RMGJH). The funders had no role in the writing of the manuscript or the decision to submit the paper for publication. All authors declare no competing interests.

Alvaro Schwalb, Lara Goscé, Rein M G J Houben
alvaro.schwalb@lshtm.ac.uk

TB Modelling Group, TB Centre, London School of Hygiene & Tropical Medicine, London, UK (AS, LG, RMGJH); Department of Infectious Disease Epidemiology, London School of Hygiene & Tropical Medicine, London, UK (AS, LG, RMGJH); Instituto de Medicina Tropical Alexander von Humboldt, Universidad Peruana Cayetano Heredia, Lima, Peru (AS); Institute for Global Health, University College London, London, UK (LG)

1 WHO. Tuberculosis in prisons. 2023. https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2023/featured-topics/tb-in-prisons (accessed Aug 20, 2024).
2 Walter KS, Martinez L, Arakaki-Sanchez D, et al. The escalating tuberculosis crisis in central and South American prisons. *Lancet* 2021; **397:** 1591–96.
3 Martinez L, Warren JL, Harries AD, et al. Global, regional, and national estimates of tuberculosis incidence and case detection among incarcerated individuals from 2000 to 2019: a systematic analysis. *Lancet Public Health* 2023; **8:** e511–19.
4 Liu YE, Mabene Y, Camelo S, et al. Mass incarceration as a driver of the tuberculosis epidemic in Latin America and projected effects of policy alternatives: a mathematical modelling study. *Lancet Public Health* 2024; published online Oct 14. https://doi.org/10.1016/S2468-2667(24)00192-0.
5 WHO. Global tuberculosis report 2023. 2023. https://iris.who.int/bitstream/handle/10665/373828/9789240083851-eng.pdf?sequence=1 (accessed Aug 21, 2024).
6 Dye C, Williams BG. Tuberculosis decline in populations affected by HIV: a retrospective study of 12 countries in the WHO African Region. *Bull World Health Organ* 2019; **97:** 405–14.
7 Kubjane M, Osman M, Boulle A, Johnson LF. The impact of HIV and tuberculosis interventions on South African adult tuberculosis trends, 1990-2019: a mathematical modeling analysis. *Int J Infect Dis* 2022; **122:** 811–19.
8 Pivetta de Araujo RC, Martinez L, da Silva Santos A, et al. Serial mass screening for tuberculosis among incarcerated persons in Brazil. *Clin Infect Dis* 2024; **78:** 1669–76.