The real reason TB remains the top infectious killer

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> Tuberculosis (TB) continues its grim reign as the world's deadliest single infectious agent, a status that has persisted despite decades of global health initiatives. The World Health Organization (WHO) set ambitious targets for its End TB Strategy: a 95% reduction in TB deaths and a 90% reduction in TB incidence between 2015 and 2035. But a recent systematic analysis for the Global Burden of Disease Study 2023, published in Lancet Infect Dis, paints a stark picture of the challenges ahead, particularly in the wake of recent funding cuts.1

KEY TAKEAWAYS

- The Pivot: Global health funding reductions threaten progress towards the WHO End TB Strategy targets, making a comprehensive burden assessment critical.
- The Data: TB remains the leading global cause of death from a single infectious agent, with multidrug-resistant TB (MDR-TB) adding complexity.
- The Action: Clinicians should be aware of the persistent, high global burden of TB and MDR-TB, especially in high-risk populations, and advocate for sustained public health investment.

Tuberculosis, a disease that has plagued humanity for millennia, continues to exact an immense toll on global health. The bacterium Mycobacterium tuberculosis, transmitted through airborne droplets, primarily affects the lungs but can impact any organ system. Its insidious nature, often presenting with non-specific symptoms like cough, fever, and weight loss, frequently leads to delayed diagnosis and onward transmission. The emergence of drug-resistant strains, particularly multidrug-resistant TB (MDR-TB), further complicates treatment and control efforts, demanding longer, more toxic, and less effective regimens.1

The Global Burden of Disease Study (GBD) 2023 TB HIV Collaborators undertook a systematic analysis to quantify the burden of TB and MDR-TB across 204 countries and territories.1 This comprehensive assessment, published in 2026, aimed to provide a baseline understanding of the disease's prevalence and mortality before recent disruptions in global health funding could fully manifest their impact. The study also evaluated progress toward the WHO End TB incidence and mortality targets, which aim for substantial reductions by 2035.1

The Scope of the Global Burden of Disease Study

The GBD 2023 analysis is a monumental undertaking, drawing on a vast array of data sources to estimate disease burden. For TB, this includes national surveillance data, vital registration systems, verbal autopsy studies, and epidemiological surveys.1 The collaborators employed a sophisticated modelling framework to account for data gaps, under-reporting, and variations in diagnostic capacity across different regions. This approach allows for a standardized comparison of disease burden over time and across diverse populations, providing a more accurate reflection of the global TB situation

than individual country reports alone.1

The study specifically disaggregated data by HIV status, recognizing the profound synergistic relationship between HIV infection and TB. HIV-positive individuals are significantly more susceptible to developing active TB disease and face higher rates of treatment failure and mortality.1 Understanding this interaction is essential for targeted interventions and for accurately assessing the overall burden. The analysis also focused on MDR-TB, a growing public health crisis that poses a severe threat to TB control efforts worldwide.1

Persistent High Burden and Stalled Progress

The GBD 2023 analysis confirmed that TB remains the leading global cause of death from a single infectious agent.1 This stark reality emphasizes the persistent failure of global health systems to adequately control a preventable and curable disease. The study's detailed estimates of incidence and mortality rates across 204 countries and territories revealed significant regional disparities, with high-burden countries in Southeast Asia and Africa continuing to bear the brunt of the epidemic.1

Despite concerted efforts over the past two decades, the pace of reduction in TB incidence and mortality has been insufficient to meet the WHO End TB Strategy targets. The 2015 baseline for the strategy aimed for a 95% reduction in TB deaths and a 90% reduction in TB incidence by 2035. The GBD 2023 data indicated that while some progress had been made, the trajectory was not steep enough.1 This suggests that current strategies, while effective in some contexts, are not universally scalable or sufficiently impactful to achieve the ambitious goals set by the WHO. The Oxford Handbook of Infectious Diseases and Microbiology provides a concise guide to understanding the complex epidemiology and management of such persistent global health threats.

The Shadow of Multidrug-Resistant TB

Multidrug-resistant TB (MDR-TB) presents a particularly intractable challenge. The GBD 2023 analysis provided updated estimates of MDR-TB burden, highlighting its increasing prevalence in many regions.1 MDR-TB is defined as resistance to at least isoniazid and rifampicin, the two most potent first-line anti-TB drugs. Treating MDR-TB requires second-line drugs, which are often less effective, more expensive, and associated with more severe side effects. The duration of MDR-TB treatment can extend to 18-24 months, compared to 6 months for drug-susceptible TB, leading to higher rates of patient attrition and further resistance development.1

The study's findings on MDR-TB emphasize the essential need for robust surveillance systems, rapid diagnostic tools, and access to effective second-line regimens. The global community has struggled to scale up these interventions, particularly in resource-limited settings where the burden of MDR-TB is highest. The economic and social costs associated with MDR-TB are immense, impacting not only individual patients and their families but also national health systems and broader economic development.1

The HIV-TB Co-epidemic

The GBD 2023 analysis meticulously detailed the burden of HIV-related TB.1 HIV infection severely compromises the immune system, making individuals highly vulnerable to TB. TB is a leading cause of death among people living with HIV, and conversely, HIV infection is the strongest risk factor for developing active TB disease. The study's data on HIV-related TB incidence and mortality provided important insights into the ongoing challenges of managing this co-epidemic.1

The findings highlighted the importance of integrated HIV and TB services, including routine TB screening for people living with HIV, HIV testing for TB patients, and co-administration of antiretroviral therapy (ART) and anti-TB drugs.1 Despite significant progress in ART scale-up, the persistent burden of HIV-related TB indicates that gaps remain in the delivery of these integrated services, particularly in sub-Saharan Africa, which carries the highest burden of both diseases.1

The Impact of Funding Disruptions

A key motivation for the GBD 2023 study was to assess the TB burden before recent reductions in global health funding could fully impact control efforts.1 The abstract explicitly states that these disruptions threaten TB control, making a baseline assessment essential. While the study itself provides the baseline data, it implicitly warns that future analyses may show a worsening situation if funding cuts persist. Reduced funding can lead to cuts in essential services, including TB diagnosis, treatment, and prevention programs, as well as research and development for new tools.1

The long-term consequences of underinvestment in TB control are dire. They include increased incidence, higher mortality rates, and a greater spread of drug-resistant strains. The GBD 2023 data, therefore, serves as an essential advocacy tool, demonstrating the immense burden that remains and the potential for backsliding if political will and financial commitments wane.1

Limitations and Future Directions

The GBD 2023 study, while comprehensive, relies on modelling to fill data gaps, particularly in regions with weak surveillance systems. The accuracy of these estimates is dependent on the quality and completeness of the input data, which can vary significantly across countries.1 The study's ability to capture the full extent of undiagnosed or misdiagnosed TB cases, especially in remote or marginalized populations, is inherently challenging. The impact of the COVID-19 pandemic, which disrupted TB services globally, may also not be fully reflected in the 2023 data, as its long-term effects on TB epidemiology are still unfolding.1

The study's findings emphasize the urgent need for continued investment in TB research, including the development of new vaccines, faster diagnostics, and shorter, more effective drug regimens for both drug-susceptible and drug-resistant TB. Strengthening health systems, improving access to care, and addressing social determinants of health, such as poverty and malnutrition, are also essential for achieving the WHO End TB targets. Without a renewed global commitment, the aspiration of ending TB by 2035 will remain an elusive goal.1

> **CLINICAL IMPLICATIONS**
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> The GBD 2023 analysis confirms what many clinicians on the ground already know: tuberculosis remains a formidable foe, far from being relegated to the history books. The persistent status of TB as the leading cause of death from a single infectious agent should be a stark reminder that complacency is not an option. GPs and specialists, particularly those in areas with high migrant populations or immunocompromised patients, must maintain a high index of suspicion for TB, even in non-endemic settings.
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> The data on multidrug-resistant TB is particularly concerning. The longer, more complex treatment regimens for MDR-TB place an enormous burden on both patients and healthcare systems. This necessitates not only robust diagnostic capabilities but also unwavering adherence support and meticulous follow-up to prevent further resistance. The notion that TB is a 'solved' problem is a dangerous delusion, directly contradicted by

> these figures.
> But the problem extends beyond individual patient management. The study explicitly links the threat to TB control to recent reductions in global health funding. This is not merely an academic point; it translates directly into fewer resources for screening, contact tracing, and treatment programs. Clinicians, therefore, have a role beyond the clinic: advocating for sustained and increased investment in public health infrastructure and global health initiatives is essential to prevent a resurgence of this ancient scourge.

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REFERENCES

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