



Editorial

World TB Day 2026: Scientific innovation across the tuberculosis continuum must now translate into global impact



World TB Day, observed annually on March 24th, highlights the continuing global burden of tuberculosis (TB) and the urgent need for coordinated action to eliminate the disease. Despite being preventable and curable for decades, TB continues to exact a devastating global toll [1]. The World Health Organization (WHO) [2] estimates that 10.7 million people developed TB in 2024, and 1.23 million died from the disease worldwide, making TB the leading cause of death from a single infectious microorganism worldwide.

Although global TB services have partially recovered following the disruptions caused by the COVID-19 pandemic, progress toward the WHO End TB Strategy milestones remains far off track. Between 2015 and 2024, the global TB incidence rate declined by only 12.3%, far below the 50% reduction target set for 2025 under the WHO End TB Strategy [2]. The persistence of high transmission, continued emergence and spread of drug-resistant disease, and large diagnostic and treatment gaps emphasize the urgent need to accelerate progress.

The global response to TB is now confronted with a paradox. On the one hand, scientific advances across the TB continuum are rapidly progressing, including improved rapid diagnostics and shorter all-oral treatment regimens. On the other hand, implementation of these innovations remains uneven, constrained by fragile health systems, persistent inequalities in access to care, and chronic underinvestment in TB programs [3]. Global funding for TB prevention, diagnosis, and treatment has stagnated in recent years, and modelling studies warn that further reductions in international funding support could reverse recent gains in TB control.

The World TB Day 2026 theme “Yes, we can end TB” [4] reflects renewed optimism that scientific innovation, combined with strong political commitment and equitable access to care, can accelerate global TB control. The studies presented in this special issue of the *International Journal of Infectious Diseases* highlight key advances along this continuum, addressing diagnosis of TB infection, identification of asymptomatic disease, development of host-directed therapies, management of post-TB sequelae, and progress toward new vaccines.

Tuberculosis infection is defined by the detection of an immune response to *M. tuberculosis* in the absence of clinical symptoms, and radiological and microbiological evidence of TB disease. Early identification of TB infection is central to TB elimination strategies, as individuals with infection constitute the reservoir from which future disease emerges. With approximately one quarter of the global population estimated to have TB infection [2], improving detection and targeted preventive interventions are essential to reduce future TB disease incidence.

In this issue, Araújo-Pereira and colleagues review advances in the diagnosis of TB infection, focusing on immunological tests, their interpretation in clinical practice, and the persistent challenge of identifying those at highest risk of progression to disease [5]. The authors highlight how a better understanding of host immune responses may help refine risk stratification for progression to disease and guide more targeted preventive therapy strategies.

The practical application of these diagnostic tools is illustrated in the study by Kyaw and colleagues investigating a TB cluster in a high-rise residential building [6]. Through the integration of interferon- γ -release assays (IGRAs), genomic epidemiology, and environmental modelling, the authors identified significant transmission among residents. This investigation underscores the importance of combining modern immunological diagnostics with epidemiological and environmental analyses to better understand TB transmission dynamics in densely populated settings.

Host-related factors can further impact the accuracy of TB infection diagnostics. Petrone et al. [7] investigate the effects of diabetes on TB infection diagnosis, noting that metabolic dysregulation may modify immune responses and potentially influence the reliability of immunological tests such as IGRAs and skin tests. The increasing prevalence of the TB–diabetes syndemic underscores the importance of implementing integrated screening and prevention strategies targeting both infectious and noncommunicable diseases.

Beyond infection, identifying individuals with asymptomatic TB represents another major challenge. Increasing evidence suggests that a substantial proportion of TB cases may remain undiagnosed during early stages of disease, contributing to ongoing transmission. Xie and colleagues discuss how imaging technologies are used for the diagnosis and investigation of the early stages of TB [8]. High-resolution imaging modalities, including computed tomography and emerging molecular imaging approaches, enable detection of early pathological changes before clinical symptoms appear. These technologies not only support earlier diagnosis but also provide important insights into TB pathogenesis and treatment response.

Alongside improved diagnostics, advances in treatment strategies are critical for improving patient outcomes and reducing long-term complications. Conventional anti-tuberculosis therapy primarily targets the pathogen itself; however, disease progression and tissue damage are strongly influenced by host immune responses. Wong and colleagues review the emerging role of host-directed therapies (HDTs) as adjunctive approaches to conventional TB treatment [9]. These strategies aim to modulate host immune pathways involved in inflammation, cellular metabolism, and stress

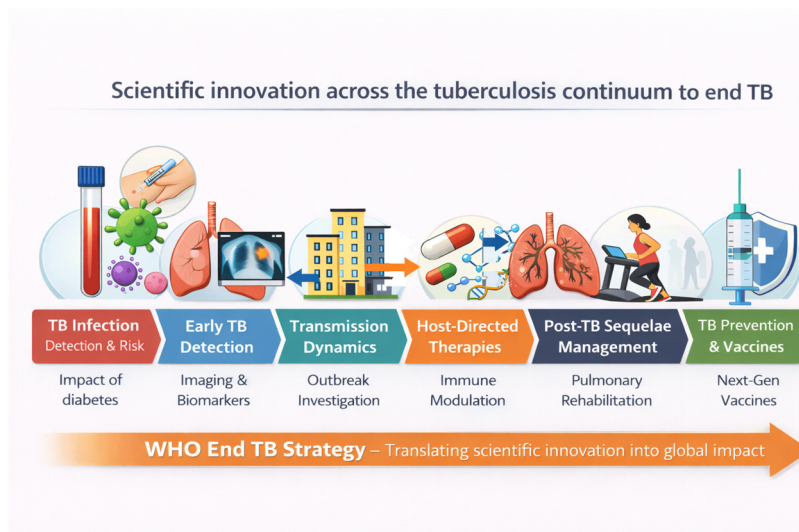


Figure 1. Scientific innovation across the tuberculosis (TB) continuum to End TB. Abbreviations: TB: tuberculosis; WHO: World Health Organization. The figure was created with the assistance of the artificial intelligence tool ChatGPT (OpenAI). The authors verified, edited, and took full responsibility for the final content.

responses to enhance mycobacterial clearance while limiting immunopathology. Importantly, many candidate HDTs involve repurposed drugs, potentially facilitating faster translation into clinical practice.

Providing deeper mechanistic insight, Loader and colleagues examine the role of matrix metalloproteinases (MMPs) in TB immunopathogenesis [10]. These enzymes contribute to extracellular matrix degradation, lung tissue destruction and cavitation in pulmonary TB, and are also implicated in complications such as tuberculous meningitis [11]. Targeting MMP-mediated pathways, therefore, represents a promising strategy to reduce tissue damage and improve clinical outcomes.

As treatment success improves globally, increasing attention is being directed toward the long-term consequences of TB. Post-tuberculosis lung disease (PTLD) is now recognized as an important cause of chronic respiratory morbidity among TB survivors [12]. In this issue, Rifat and colleagues report on a population-based study evaluating the effectiveness of pulmonary rehabilitation for PTLD in Bangladesh [13]. The study demonstrates significant improvements in lung function and exercise capacity following rehabilitation interventions. These findings highlight the importance of integrating long-term management and rehabilitation into TB programs, ensuring that patient care extends beyond microbiological cure.

Sustained progress toward TB elimination will depend on effective preventive strategies. Although Bacille Calmette–Guérin (BCG) vaccination has been used for more than a century, its protection against pulmonary TB in adults remains limited. Martín and colleagues review the current landscape of TB vaccine development, describing multiple vaccine candidates currently under clinical evaluation [14]. Advances in vaccine technologies and encouraging results from recent clinical trials have renewed optimism that a new generation of TB vaccines could significantly reduce transmission and accelerate global TB control.

Conclusion

The studies presented in this special issue illustrate the multi-dimensional nature of the global TB response. Progress in the diagnosis of TB infection, identification of asymptomatic disease, development of HDTs, rehabilitation strategies for TB sequelae, and advances in vaccine research all contribute to a comprehensive approach to TB control (Figure 1).

However, scientific progress must be accompanied by sustained political commitment, strengthened health systems, and equitable access to innovations. The message of World TB Day 2026 is clear: the tools to end TB are increasingly within reach, but translating scientific progress into population-level impact will require coordinated action across research, clinical care, public health, and policy.

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