



Editorial

Inequities underlie the alarming resurgence of Tuberculosis as the world's top cause of death from an Infectious Disease - Breaking the silence and addressing the underlying root causes

The World Health Organization (WHO) Global Tuberculosis (TB) Report 2024 [1] brought disappointing news regarding progress towards achieving the United Nations (UN) General Assembly (UNGA) End TB Strategy targets for TB control [2]. As the world is now recovering from disruptions in TB control programs due to the COVID-19 pandemic [3], in 2023, TB returned with a vengeance to being the world's leading cause of death from a single infectious agent and caused almost twice as many deaths as HIV/AIDS". The Report states "More than 10 million people continue to fall ill with TB every year and the numbers have been rising since 2021" [1]. The world is yet again running out of time to deliver the WHO End TB targets [3,4]. The global response, despite decades of declarations, frameworks, and targets, remains grossly insufficient. Only 26% of the \$22 billion required annually for TB care and prevention is available. Research funding fares worse, with merely 20% of the \$5 billion annual target achieved [1]. These funding gaps continue to hinder essential progress, including acquisition and rollout of new diagnostics, shorter treatment regimens, and development and evaluation of effective new vaccines.

Moving Beyond the Status Quo

The foundations of the UNGA and WHO End TB roadmaps are based on an equitable approach to TB prevention, care and treatment. These laudable principles are deeply rooted in the recognition of the gross disparities in healthcare access and economic challenges that exist in low- and middle-income countries (LMICs).

Several current approaches to TB control continue to view the global TB crisis as a stagnant challenge and should now be viewed as a dynamic global health crisis with recognition of persisting inequities [4–6]. What the world now needs to seriously recognise is that, despite many rallying cries over three decades for more financial investments required for TB control programs [7,8], TB remains firmly ingrained as a disease of inequality in its many forms [9–14]. The persistence of TB as the world's leading killer infectious disease reflects numerous structural inequities at every level of society [9–14]. These inequities which are rooted in socioeconomic disparities, systemic neglect, and denial of basic rights all create a fertile environment for TB to thrive [11–15]. The key dimensions of these inequities require more focused discussion at governmental and donor levels to add to the never ending but unheeded calls for made for new diagnostics, drugs and vaccines every World TB Day since it was declared a global emergency in 1992 by the WHO.

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Poverty and Tuberculosis

The links between poverty and TB have been locked in a vicious cycle since Victorian times [8–14] and will not be unravelled until there is global peace and security and the UN Charter on human rights is abided by every country in the world. People living in poverty and displaced populations arising from conflict zones and natural disasters, are more likely to experience malnutrition, overcrowded housing, inadequate sanitation, and lack of access to proper health care - all of which increase susceptibility to *Mycobacterium tuberculosis* infection and development of active TB disease [16]. The economic burden on patients with active TB is related to lost income, high out-of-pocket costs, and prolonged treatment which can entrench them further into the poverty-disease cycle [17,18]. Over 50% of TB-affected households globally face catastrophic healthcare expenditures [1]. In India, where 60% of the population earns less than \$2 per day, TB care costs often force families to sell assets or take loans, perpetuating intergenerational poverty [18].

Community Awareness and Education

In sub-Saharan Africa, regions with lower literacy rates report higher TB prevalence, as education directly influences health literacy and access [13–15]. Lack of education compounds TB risk by limiting awareness of preventive measures and delaying care-seeking behaviour. Low literacy rates correlate with lower adherence to TB treatment regimens, increasing the likelihood of drug resistance and transmission within communities. Education campaigns targeting women and youth have shown measurable reductions in TB incidence by promoting early detection and prevention strategies [15].

Inequities in Healthcare

Healthcare inequities have never been starker in TB care [4–15], and many high-burden countries, rural populations and marginalized groups lack access to TB diagnostics, trained personnel, and effective treatment. Only 48% of TB patients globally are diagnosed with WHO-recommended rapid molecular tests [1]. Delays in diagnosis prolong infectious periods and worsen outcomes and urban-rural divide play important roles. For example, in Indonesia, TB detection rates are 35% higher in urban areas than in rural ones, reflecting disparities in healthcare infrastructure. Gender Disparities in patriarchal societies, women

often face barriers to accessing TB care, leading to underreporting and worse health outcomes [1,18,19]. TB is often a slowly evolving disease, and diagnostic tests often need to be repeated over time and treatment depends on a regular supply of four drugs over six months with regular follow up to ensure adherence [19].

Intersectionality of inequities are important, and many dimensions of inequity overlap prevail. For instance, women in rural areas not only face healthcare access challenges but also encounter stigma and economic hardship. Thus context-specific approaches such as culturally sensitive outreach, gender-targeted care, and infrastructure development could yield tangible results. There are proven examples from Brazil, South Africa, and the Philippines demonstrate that addressing inequities can have ripple effects, reducing TB incidence while improving overall health outcomes.

Inequities in TB care for Displaced Populations

Other marginalized populations include refugees, prisoners, and migrants and these continue to face systemic barriers to TB care [1,15,20]. These groups often lack identification documents, legal protections, and social safety nets, leading to exclusion from public health programs.

Table 1
Inequities Driving the TB Epidemic - key insights and possible solutions.

Dimension	Impact on TB Epidemic	Statistics	Solutions	Case Studies/Examples -from Refs [1,17,19]
Poverty	Increases exposure to risk factors like malnutrition, poor housing, and delays in care	50% of TB-affected households face catastrophic costs	Universal health coverage, poverty alleviation programs	Philippines' Sin Tax Reform: Raised funds through taxation of tobacco and alcohol to support TB care
Education	Limits awareness and adherence to TB care	Low literacy regions show 20-40% higher TB prevalence	Community-led education programs	Community Health Workers (CHWs) in Ethiopia trained to improve TB awareness and referrals in rural areas
Healthcare Access	Creates barriers to timely diagnosis and treatment	Only 48% of patients receive rapid diagnostic tests	Strengthen rural health systems, ensure gender-sensitive care	Indonesia's TB program increased rural diagnostic access using mobile X-ray units
Food Security	Increases susceptibility to infection and worsens outcomes	2.3 million cases annually linked to malnutrition	Nutritional support as part of TB treatment	Brazil's Bolsa Família program tied financial aid to nutritional improvements, reducing TB incidence
Housing	Facilitates airborne transmission	30-50% of urban poor live in overcrowded housing in high-burden areas	Policies to improve ventilation and living conditions	South Africa's Mining Charter required employers to improve living conditions for workers
Basic Rights	Excludes vulnerable populations from TB services	a). Refugees are 10x more likely to develop TB	Legal protections and targeted TB programs for migrants and refugees	a). Europe's cross-border TB detection and care program for migrant populations showed improved case detection
		b). Prisoners and incarcerated people have high incidence of all forms of TB. Only 50% of TB cases in prisons are detected.	Improving prisons' TB health services	b). Systematic routine and periodical TB screening in a prison in Thailand showed reduced TB prevalence in prisons
Gender Inequity	Limits access to care for women in patriarchal societies	Women in South Asia experience a 30% diagnostic delay compared to men	Gender-sensitive outreach, free or subsidized transport to clinics	Afghanistan's home-based TB treatment for women through female health workers
Stigma	Delays diagnosis and leads to underreporting	Stigma linked to TB can reduce care-seeking behaviour by 40% in some regions	Community-driven destigmatization campaigns	increased case detection
Health System Underfunding	Weakens ability to implement widespread diagnostic and treatment programs	\$5.7 billion funding gap for TB programs in 2023	Sustainable domestic funding, global financing initiatives	Zambia's TB 'Champions Program' empowered survivors to share their stories and reduce stigma in communities
Employment Inequities	Forces TB-affected individuals out of the workforce due to stigma and long treatment durations	TB patients lose 20-30% of annual income due to the disease	Workplace TB policies ensuring non-discrimination, wage protection	India's National Strategic Plan for TB aimed to bridge funding gaps through domestic resources
Geographic Inequities	Rural populations face delayed care and lower treatment success	Rural TB patients are 50% less likely to complete treatment in Africa	Mobile clinics, telemedicine solutions	Vietnam introduced workplace TB policies that supported continued employment during treatment
				Kenya's programs (eg AMPATH) used community-based TB care to improve rural treatment rates

Refugees are 10 times more likely to develop TB compared to the general population due to crowded living conditions and limited access to healthcare. In Europe, targeted TB interventions in refugee camps have improved detection rates but remain underfunded and inconsistent

Impact of Undernutrition and poor Housing on TB Susceptibility

Food insecurity, and undernutrition weakens the immune system, making individuals more susceptible to a range of infectious diseases including TB [12,13]. Conversely, TB exacerbates malnutrition through appetite loss and metabolic demands, creating a feedback loop that worsens outcomes. Over 2.3 million TB cases annually are attributed to malnutrition, making it the largest risk factor for TB globally. Recently, nutritional support programs in Bangladesh and India have significantly reduced TB incidence by improving overall community health [1].

Housing and poor living conditions such as overcrowding and poor ventilation facilitate the airborne transmission of TB. Marginalized communities, including refugees and migrant workers, are particularly at risk due to substandard housing and lack of legal protections. Studies show that improving ventilation in households reduces TB transmission

by 40% in high-TB burden areas. South Africa's housing initiatives have reduced TB transmission in mining communities, where living conditions previously contributed to hyperendemic levels [15,17,20].

Can what has been done successfully elsewhere, be replicated for TB?

South Africa has the largest antiretroviral therapy program in the world, and between 2010–2023 has seen HIV incidence fall by 58% [15,21]. South Africa has thus shown the way forward for reducing AIDS-related deaths by 59% since 2000 and reducing AIDS-related deaths since 2010 has decreased by 57%. Seven countries (Botswana, Eswatini, Kenya, Malawi, Rwanda, Zambia and Zimbabwe) have already reached the 95–95–95 testing and treatment targets for the general population [1,20–22]. One key element in interrupting the curve was to decentralize HIV management into small and remote health care facilities and making the number of patients for each facility manageable. This could now be advanced for TB as well ensuring that even remote facilities have the resources, knowledge, diagnostics and treatments available, with sufficient backup for up in the system for managing and referring complicated cases.

Actionable solutions

In addition to the urgent country-level political and financial actions required [23] a 'New Lens' with 'reducing inequities' at its core is now essential for achieving global TB control. Several articles in this special World TB Day issue of IJID Regions describe proactive screening for latent TB infections with roll out of preventive treatment in psotive cases. However this will require overcoming logistical issues with adequate resources.

Key insights on inequities driving the ongoing TB Epidemic and possible solutions with examples are given in Table 1. This table demonstrates the multifaceted nature of TB inequities and emphasizes actionable solutions with real-world examples to inspire policymakers and healthcare providers.

Conclusions

Tuberculosis has long been recognized as a preventable and treatable illness inextricably linked to poverty, inequality, and systemic neglect. Yet, in 2025, three decades after being declared a 'Global emergency' by the WHO [24] TB remains the leading cause of death from an infectious disease globally, with nearly 1.25 million deaths and more than 10.8 million new cases reported. This dismal status quo reflects a persistent disregard for the socioeconomic determinants of health and failure to advance medical interventions.

Whilst some of the data in the 2024 WHO Global TB Report [1] are encouraging, TB incidence rates are rising again after years of decline, particularly in regions with fragile health systems. This World TB Day March 24th, 2025, we call for a radical reframing of the global response so that it addresses TB as a reflection of inequity and a major test of the world's commitment to health justice. Addressing TB requires a more holistic approach that now places 'Equity' at its core. It is not just about medical interventions but tackling the root social and economic causes of poverty, malnutrition, poor living conditions, and systemic health services neglect. Closing these gaps will not only combat TB but also build more resilient and equitable societies. The fight against TB is a fight for justice [8–10]. Justice for the poor, disadvantaged and neglected members of all communities worldwide. Let us ensure this world TB Day March 24th, 2025, that we focus political, civil society, community and funders' attention on redressing this injustice and that no one is left behind and to governments and donors we say "Yes! We Can End TB: Commit, Invest, Deliver".

Author Declarations

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