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Editorial

Beating leprosy: Unmasking challenges, ending stigma, & prioritizing mental well-being

Leprosy, a disease long associated with stigma and discrimination, continues to challenge global health efforts despite significant advances in treatment and prevention. The stigmatisation isolates patients, limits their opportunities, and exacerbates mental health issues like anxiety and depression. Compounding these challenges are delayed diagnoses, gaps in treatment, and discriminatory laws in many countries.

In 2001, the World Health Organization (WHO) declared that leprosy as a public health issue was globally eliminated, with a reduction in prevalence to below 1 per 10000[1]. This generated a false sense of security and the impression that the disease had been eradicated, no longer requiring resources. As per the Weekly Epidemiological Record (WER) of August 2024, about 1.8 lakh new leprosy cases were detected globally, with a new case detection rate of 22.7 per million[2]. The WHO unveiled a roadmap for 2021 to 2030, prioritising 20 Neglected Tropical Diseases (NTDs), of which leprosy is a part[3]. The target of this NTD roadmap is elimination by 2030, which will occur in stages. The first stage is transmission interruption as assessed by the new case detection rate among children under 15 yr, with zero new autochthonous cases for at least five years[3]. Elimination is achieved once a country reports zero new indigenous cases for at least three years. This is followed by post-elimination surveillance for 10 years. The global targets for 2030 included 120 countries with zero new autochthonous cases, a 90 per cent reduction in grade 2 disability and new child case detection rate, and a 70 per cent reduction in annual new case detection rate[4]. To monitor the impact, the milestone till 2023 included 75 countries with zero new autochthonous cases, about 1.48 lacs new cases, 0.92 per million new cases with Grade 2 Disability (G2D), and 5.66 per million new child case detection rate[3]. As per WER (August 2024), the 2023 data from various WHO regions showed 1.8 lacs new cases from all regions, which was about five per cent higher than 2022[2]. Most of the burden still arose from Southeast Asia (79.3%), and Brazil, Indonesia, and India had the highest number of cases. India reported about 1.07 lac cases in 2023, 3.9 per cent higher than in 2022[2]. The new child case detection rate, which is a marker for recent disease transmission, was 3.9 per million, with 10,322 new cases globally, of which India reported more than half (5582)[2]. Fifty-six countries reported zero new cases in 2023, and two countries- Maldives and Jordan acquired WHO certificates of interruption of transmission and elimination, respectively[2]. The G2D rate in 2023 was 1.2 per million, with about 9729 cases worldwide, of which about 2300 cases were reported from India, indicating a delay in the detection[2]. Thus, the ambitious goals of zero leprosy are far-fetched rather than optimistic and just continued reduction in 'actual' incidence would be more accurate and effective. Even more than two decades after WHO declared Leprosy as no longer a public health problem, there is a continued occurrence of new cases, and a leprosy-free world is still a challenge for leprosy programmes due to the lack of expertise and resources.

While we set our eyes on the goal of a leprosy-free world by 2030, there are issues that we should not forget. Drug resistance in leprosy is an emerging public health concern, particularly in high-burden countries like India[5-8]. Cases resistant to rifampicin, dapsone, and ofloxacin—key drugs in the standard multi-drug treatment (MDT) regimen—are being reported with increasing frequency[5-8]. India, which contributes significantly to the global leprosy burden, faces additional challenges due to limited drug-resistance testing facilities and gaps in the surveillance systems[9]. This not only hampers effective disease control but also leads to prolonged treatments, higher relapse rates, and a greater risk of transmission. Addressing drug resistance requires a concerted effort to enhance laboratory capacities, implement routine drug-susceptibility testing, and invest in research for

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alternative therapeutic regimens. The global scenario remains fraught with hurdles. According to the latest data, there has been an alarming rise in drug-resistant cases of leprosy, a growing concern for public health experts. Despite the WHO's goal of eliminating leprosy by 2030, limited infrastructure for drug-resistance testing has hindered effective monitoring and treatment[10]. This gap perpetuates a vicious cycle of recurrent and recalcitrant reactions, often leading to deformities, social destitution, and impoverishment[6]. The lack of accessible, affordable, and effective diagnostic tools exacerbates this issue, calling for robust policy interventions and funding for specialized laboratories[6].

Adding to these concerns is the identification of *Mycobacterium lepromatosis*, a species distinct from *Mycobacterium leprae,* implicated in leprosy cases with increased morbidity and mortality[11,12]. While most reports of *M. lepromatosis* originate from America, cases have now been identified in India, raising significant alarm[11,12]. A study from America highlighted the severe clinical manifestations and complications associated with *M. lepromatosis*, underscoring the heightened disease burden it can impose[13]. India, where slit skin smear (SSS) examinations—a cornerstone of leprosy diagnostics – are already underutilized, faces an uphill task in effectively detecting and managing this emerging threat. The lack of adequate surveillance and diagnostic capabilities for *M. lepromatosis* poses a critical question: how will we tackle this new challenge when basic diagnostic practices are not consistently implemented? This highlights an urgent need for enhanced diagnostic protocols and expanded research to address the complexities introduced by this pathogen.

Leprosy, beyond its physical manifestations, has a profound yet often overlooked impact on mental health[14]. While considerable emphasis has been placed on combating stigma, the implementation of concrete measures to alleviate the psychological burden remains inadequate. Patients frequently grapple with depression, anxiety, and social isolation, which not only diminish their quality of life but also impede their recovery. Addressing these challenges requires the inclusion of mental health interventions as an integral component of leprosy management[15]. Counselling, cognitive behavioural therapy, and peer-support programmes are essential tools to support affected individuals. Clinicians and policymakers must elevate mental health care to the same priority level as medical treatments to ensure a holistic approach to the management of leprosy.

The WHO Global Leprosy Strategy's cornerstone is zero stigma and discrimination. However, as recently as 2023, 101 discriminatory laws targeting individuals with leprosy remained active worldwide[2]. These laws perpetuate societal barriers that limit affected individuals' social mobility and psychosocial development. Furthermore, the lack of awareness and understanding among both patients and their contacts often exacerbates feelings of anxiety and depression. Stigma operates across multiple levels – personal, interpersonal, community, institutional, and structural – necessitating comprehensive, multi-level interventions[3]. At the personal level, self-help programmes, support groups, and cognitive behavioural therapy can foster resilience. Interpersonal strategies, including social interaction with affected individuals and home care support, offer additional avenues for intervention[3,16,17].

Broader reforms, such as revoking discriminatory laws, launching awareness campaigns, and implementing supportive policies, are critical in fostering acceptance and understanding within communities[16,17]. Yet, despite anti-discrimination policies in many countries, their impact often remains confined to paper, with little tangible effect on societal attitudes. Clinicians play a pivotal role in bridging this gap by educating patients about the non-contagious nature of treated leprosy and spearheading community awareness efforts to dismantle myths. Collaborations with NGOs and community leaders can further enable the rehabilitation and social reintegration of those affected, breaking down barriers and creating an environment of inclusion and support.

An ongoing challenge in the fight against leprosy is the effective treatment of highly bacillated patients, relapsed cases, and non-responders. While the WHO recommends a standard fixed-duration multidrug therapy (FDT) of 12 months for multibacillary cases, evidence from multiple studies indicates that this regimen may be insufficient for heavily bacillated patients, such as those with polar lepromatous and histoid forms of the disease. Research has shown that these patients often continue to harbour viable bacilli in their skin even after completing FDT, which not only perpetuates transmission but also leads to chronic reactions, relapses, and worsening nerve damage, undermining efforts to meet the global target of ending leprosy transmission by 2030[18]. Without treating these cases comprehensively, the goal of stopping the transmission will remain unattainable.

There is a critical need for enhanced drug regimens and adjunctive therapies to tackle this issue. Prolonged antimicrobial treatment beyond 12 months may be necessary for highly bacillated cases[18]. Immunotherapy, such as the *Mycobacterium indicus pranii* (MIP) vaccine, has emerged as a potential adjunct to FDT[19]. Studies on MIP highlight its ability to boost the cellular immune response, promoting protective Th1-type cytokine production (INF-gamma, TNF-alpha, and IL-12) and enhancing CD8+ T-cell cytotoxic activity. This immunomodulatory effect can improve bacterial clearance and reduce the risk of relapse.

In addition to vaccines, the need of the hour is to modify the MDT regimen by using potent bactericidal agents such as minocycline, moxifloxacin, or Bedaquiline to strengthen the treatment framework[20,21]. Recent case studies and reviews have emphasised the role of this alternative approach in addressing gaps in the current standard of care.

The theme of World Leprosy Day 2024, 'Beat Leprosy', reflects the urgency of tackling cases where standard MDT is ineffective or partially effective. Meeting the challenge of highly bacillated cases requires a paradigm shift towards innovative treatment strategies, robust research on next-generation drugs, and an integrated approach combining antimicrobial and immunological therapies. Without these advancements, achieving the vision of a leprosy-free world will remain an elusive goal.

Significant progress has been made in the fight against leprosy, yet many challenges persist. A leprosy-free world is only achievable with a holistic approach that addresses the medical, social, and psychological dimensions of the disease. Global health initiatives can make meaningful strides toward the ambitious goal of elimination by prioritizing early detection, enhancing treatment protocols, combating stigma, and promoting mental well-being. Collaboration among governments, non-government organizations (NGOs), and communities is essential to ensure sustained progress and empower those affected to lead dignified lives. Together, we can beat leprosy and create a future free from its shadow.

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