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World tuberculosis day 2023 – Reflections on the spread of drug-resistant tuberculosis by travellers and reducing risk in forcibly displaced populations

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World Tuberculosis (TB) Day, March 24th, 2023, will commemorate the day in 1882 when Professor Robert Koch announced his discovery of *Mycobacterium tuberculosis* (*Mtb*) when TB ravaged Europe. Over a century later, in 1993, the World Health Organization (WHO) declared TB a global health emergency. Since then, there have been 60 million deaths due to TB. The tragic state of affairs reflects a great paradox – that, despite affordable and effective TB treatment being available for the past seven decades, the latest 2022 WHO Annual Global Tuberculosis Report highlights that TB remains a leading cause of ill health and death from an infectious disease worldwide [1]. In 2021, the WHO estimated that 10.6 million people fell sick with TB worldwide: six million men, 3.4 million women and 1.2 million children. Multidrug-resistant TB (MDR-TB) remains a threat to global health security. Only one in three people with drug-resistant TB can access treatment; many remain undiagnosed and untreated. TB today occurs in every part of the world. An estimated 1 billion people have latent *Mtb* infection (LTBI), where the mycobacteria do not cause clinical disease but serve as a reservoir and can re-activate at any time under conditions of stress, malnutrition, poor housing, co-infections and co-morbidities, among other [35].

Millions of people with active TB continue to suffer, remain undiagnosed, and spread both forms of TB –drug-sensitive and drug-resistant. Many of these people travel across the world voluntarily for business or pleasure or are involuntarily forcibly displaced from their homes and countries due to wars, conflicts, famine, or natural disasters [2–5]. As the COVID-19 pandemic illustrates, infectious diseases do not respect international boundaries and spread rapidly between countries and continents. Regional and international travel is no doubt responsible for the spread of TB across the world [26]. However, the magnitude of the problem has been challenging to define due to the long incubation period and the insidious and slow progression of clinical disease symptoms and signs. It usually manifests many months or years after the first infection.

All travellers who move by air, land or sea face the perennial potential risk of airborne or droplet-borne transmission or acquisition of respiratory tract infections, including TB [6,7,8]. Over the past decade, multidrug-resistant TB (MDR-TB) has become an increasingly important public health problem in Asia, Africa, and Eastern Europe, exacerbated by the emergence of extensively drug-resistant TB (XDR-TB). MDR-TB is uncommon in traditional travellers; however, individual incidents involving MDR-TB and XDR-TB in airline passengers have been reported [9–11].

In 2006 the WHO published a second edition of tuberculosis and air travel: guidelines for prevention and control [12]. That provides information and specific guidance for passengers and crew, physicians, public health authorities and travel companies, although it now requires updating. Every year, millions of people travel to sporting and religious events, where mass gathering increases the risk of transmitting a range of infectious diseases, including TB. The globalisation of antibiotic-resistant bacteria at recurring mass-gathering events is known to occur. However, no specific studies have been performed on the globalisation of drug-resistant TB due to travel to and from endemic countries [13,14]. Such prospective studies are challenging to perform. Nevertheless, opportunities for developing them often occur [14].

Millions have had to travel forcibly or voluntarily for several decades across nations and continents due to conflicts, poverty, natural disasters, drought, and economic hardships. TB is a known cause of morbidity and mortality among refugees and migrant populations. The past decade has seen an increase in migration and forced displacement with potential movements of people from high TB burden settings, including MDR-TB, to TB-burdened countries. There appears to be little risk of transmission of MDR-TB to host populations from migrants to Europe, with more chance of transmission noted within migrant communities [13]. By mid-2022, United Nations High Commission for Refugees reports that 103 million people have been forcibly displaced worldwide, including

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53.2 million as internally displaced people and 32.5 million as refugees [15]. These groups are among the most vulnerable populations at increased risk of developing TB [2,4,5].

Finding and treating new TB cases among these mobile populations is one of the biggest global challenges facing public health systems. Many of them are undocumented, live in poor conditions, with limited access to health care and TB services [16,22]. In addition, they may come from weak health systems where trust in the system or access is low [17]. Ethical screening programs that objectively risk stratification for TB, improved screening or diagnostic tools, and optimal management strategies for LTBI are required to avoid stigmatising or ineffective practices. An increasing number of healthcare and humanitarian workers travel to work where the incidence of multidrug-resistant tuberculosis (MDR TB) is high, which may put them at increased risk of infection or developing clinical disease. The risk of transmission to them is ever-present due to inadequate infection control practices due to lack of respiratory protection or isolation facilities and the inability to make an early and accurate diagnosis of people with MDR TB. Increased awareness of this risk must be made to healthcare and other charity workers. They must make their travel known to their general practitioners if they develop symptoms after returning to their home countries.

The need for action has become even more pressing in the context of the 2022–2023 war in Ukraine, ongoing conflicts in other parts of the world, a global energy crisis and associated risks to food security, which are likely further to worsen some of the broader determinants of TB. There are 30 high MDR/RR-TB burden countries, which include Ukraine. Since the Russian invasion of Ukraine on February 24th, 2022, more than 10 million Ukrainian residents, including hundreds of thousands of older people, have travelled across Europe [29,31], and this is associated with the risk of exportation of all forms of TB including MDR-TB [23,24], and development of active TB in apparently healthy refugees due to stress, poor nutrition and poor housing re-activating latent TB infection [32,35].

Worryingly, for the first time since 2012, TB death rates have again started to increase globally. That is most likely due to the direct or indirect effects of the COVID-19 pandemic and the inattention of governments, donors, public health bodies and health services [1]. As occurred with other infectious and non-infectious diseases, COVID-19 had a significant impact also on TB, including emerging coinfections [18,20], with drug-resistant TB cases [18], affecting the performance of TB control programs and services in multiple countries [19], and even the notification of cases during the pandemic [20], among other consequences [28–30].

Despite advances in diagnostics and treatments, the continued global emergency of TB emphasises the need for a universally effective TB vaccine, and developing the current vaccine pipeline is a priority [21]. The United Nations General Assembly will hold the second high-level meeting on the fight against TB on September 22nd, 2023 [22,23]. The theme of the meeting is: “Advancing science, finance and innovation, and their benefits, to urgently end the global TB epidemic, in particular, by ensuring equitable access to prevention, testing, treatment and care.” World TB Day, March 24th, generates government and funder advocacy and builds public awareness about the global TB epidemic and efforts to eliminate the disease [25–27]. It is crucial that World TB Day 2023, with the theme ‘Yes! We can end TB!’ will encourage high-level leadership from committed governments and generate increased investments, faster uptake of new WHO recommendations, adoption of innovations, accelerated action, and multisectoral collaboration to combat the TB epidemic [31–34]. This year it is critical, with opportunities to raise visibility and political commitment at the 2023 UN High-Level Meeting on TB. The direct and indirect economic consequences of the COVID-19 pandemic leave policymakers in a challenging situation. The need to recover lost ground in the fight against TB across all sectors globally is clear.

Conflicts of interests

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