

Tuberculosis diagnosis in a region most affected by the 2023 earthquake in southern Türkiye

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Dear Editor,

Tuberculosis (TB) is a worldwide infection with devastating impact on human health and the global economy (1). To reduce its burden, WHO launched the End TB Strategy (2), and the WHO Regional Office for the Eastern Mediterranean issued recommendations in 2015 to sustain the goals of the strategy in complex emergencies (3). However, the COVID-19 pandemic has caused a setback in the achievement of the TB programme targets globally (4), and our study published previously in *Eastern Mediterranean Health Journal* reported deteriorations in many parameters of the TB control programme in our region during the first year of the pandemic (5).

On 6 February 2023, 2 consecutive massive earthquakes that originated near our city struck southern Türkiye (home to 13 million people) and northern Syria. As a result of these earthquakes, tens of thousands of people died and around one million faced problems with shelter, heating and access to food and water which took months to resolve. Such major natural disasters often affect the healthcare system, including TB control programmes, although no study has reported how these quakes affected TB programming in the region.

We conducted the study to analyse the number of TB diagnostic tests performed and the number of patients diagnosed with TB in Malatya, one of the regions most affected by the quakes. The data were collected from the electronic records of the Malatya TB Diagnostic Laboratory, the only authorized TB diagnostic facility in the city. The annual data before (2022) and after (6 February 2023 to 5 February 2024) the earthquake were compared statistically and the results presented (Figure 1).

There were significant decreases in the number of TB tests performed (2353 vs 2081; $P = 0.011$), the number of patients tested for TB (1611 vs 1049; $P = 0.032$), and the number of patients diagnosed with TB (71 vs 37; $P = 0.004$) in our city between the year of the earthquake and the previous year. After the earthquake, the healthcare facilities continued services without any significant disruption because there was no considerable damage to the hospital buildings, and the health ministry deployed healthcare staff and medical consumables to the hospitals.

However, we obtained feedback indicating that 2 patient-based factors were responsible for the reduction in the number of TB samples. Firstly, instead of seeking remedy for a non-urgent health problem with vague symptoms, most people focused on meeting their basic life needs following disruptions by the earthquakes. Secondly, within a few weeks after the earthquake, about 100 000 people had emigrated from our region. These 2 patient-based factors were due to the efforts of inhabitants to find suitable shelter, as thousands of buildings were damaged by the earthquakes during winter.

Although our finding was not statistically significant, the proportion of patients whose respiratory samples had high acid-fast bacilli grade ($\geq 2+$) almost doubled in 2023, most likely because TB patients were late in seeking healthcare. Such an increase in the spread of TB through respiratory route would have facilitated more effective TB spread (6), particularly in communal shelters where tens of thousands of people camped. In Japan, following the 2011 earthquake, living in shelters was found to be associated with a significant increase in TB transmission among residents (7).

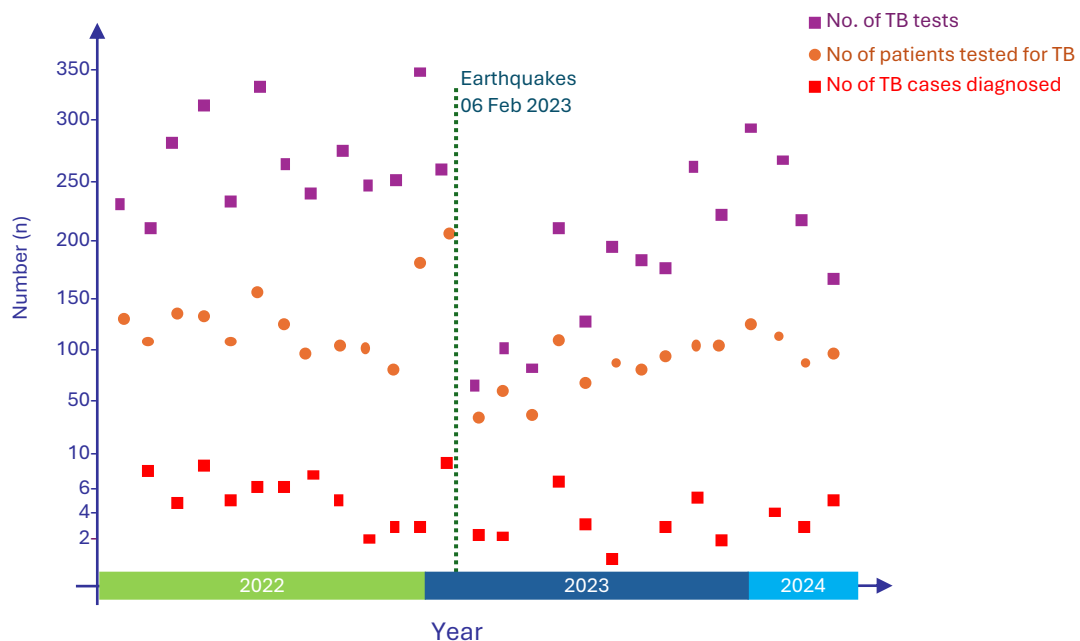
A major earthquake is an important and complex emergency because earthquakes are one of the most destructive natural disasters that affect large geographical areas. Tuberculosis has a special place among communicable diseases because it affects a significant proportion of the world's population and its control requires rigorous interventions over decades.

This study has shown that a major earthquake that damages people's shelters, even if it does not significantly affect the health system, can significantly reduce TB diagnosis, suggesting a risk of an increase in the number of undiagnosed TB cases among those emigrating from the area, and thus triggering a resurgence. It is therefore important to comprehensively analyse the changes in TB control indicators after such massive earthquakes, in order to develop more specific responses that will help avoid the drawbacks of TB diagnosis during complex emergencies and increase the possibilities of achieving the goals of the End TB strategy.

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Figure 1. Monthly numbers of TB tests performed, patients tested for TB, and the TB cases diagnosed from 1 January 2022 to 1 May 2024.



References

- Ahlburg, Dennis A. The economic impacts of tuberculosis. Geneva: World Health Organization, 2000. <https://iris.who.int/handle/10665/66238>.
- World Health Organization. Global strategy and targets for tuberculosis prevention, care and control after 2015. Geneva: World Health Organization, 2014. <https://iris.who.int/handle/10665/162760>.
- World Health Organization. Tuberculosis control in complex emergencies. Cairo: WHO Regional Office for the Eastern Mediterranean, 2015. <https://www.who.int/publications/i/item/tuberculosis-control-in-complex-emergencies>.
- World Health Organization. Global tuberculosis report 2021. Geneva: World Health Organization, 2021. <https://www.who.int/publications/i/item/9789240037021>.
- Yakupogullari Y, Ermis H, Kazgan Z, Otlu B, Bayindir Y, Gulbas G, Tanriverdi E, Guldogan E. Diagnostic and treatment outcomes of patients with pulmonary tuberculosis in the first year of COVID-19 pandemic. *East Mediterr Health J* 2022;28(9):682-689. <https://doi.org/10.26719/emhj.22.060>
- Lohmann EM, Koster BF, le Cessie S, Kamst-van Agterveld MP, van Soolingen D, Arend SM. Grading of a positive sputum smear and the risk of *Mycobacterium tuberculosis* transmission. *Int J Tuberc Lung Dis* 2012;16(11):1477-1484. DOI: 10.5588/ijtld.12.0129
- Sakurai M, Takahashi T, Ohuchi M, Terui Y, Kiryu K, Shikano K. Increasing incidence of tuberculosis infection in the coastal region of Northern Miyagi after the Great East Japan Earthquake. *Tohoku J Exp Med* 2016;238(3):187-195. DOI: 10.1620/tjem.238.187.