

Multi-Risk Factors Behind the 2023 Kahramanmaraş (Türkiye) Earthquake Disaster

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Keywords: *Social Vulnerability, Exposure, Poverty, Corruption, Earthquake*

Abstract

In the early hours of 6 February 2023, a magnitude 7.8 earthquake struck south-eastern Türkiye. Nine hours later, a magnitude 7.6 earthquake also rocked the region. The relatively shallow depth of the earthquakes, at about 10 km, resulted in severe shaking over a large area of Türkiye and Syria. As of 1 April 2023, the total death toll of over 57,000 (50,000 in Türkiye and 7,000 in Syria) makes this event the deadliest in modern Turkish history. In this presentation we discuss the state of knowledge of the seismic hazard and the social preconditioning factors that contributed to the tragic events in Türkiye and Syria. We show that the seismic hazard along the East Anatolian Fault, which hosted the earthquakes was well known, yet the devastating impacts indicate that the risks were not adequately considered. The earthquakes occurred during a winter storm with outdoor temperatures as low as -19 °C. They also triggered major aftershocks, several thousand landslides, dam bursts in Syria and flooding. We discuss how the multi-hazard context of the earthquakes exacerbated the impact in the hours to weeks after the main earthquakes. Additionally, we suggest that acute vulnerabilities arising from exposure, corruption and poverty led to a lack of seismic preparedness. We expand on the social factors and discuss how each contributed to amplifying the earthquake risk into the tragic disaster. We end by making recommendations on the ways forward to mitigate seismic risk through better integration of multi-hazard and multi-risk thinking, and management of social vulnerabilities.

ID UKADR ABS-2023-001