

8TH WORLD CONGRESS ON PUBLIC HEALTH AND GLOBAL WELLNESS

November 14-15, 2025 | London, UK



Omid Aboubakri¹ , Hamid Reza Shoraka², Marzieh Mahmoodi Manesh³

¹Assistant Professor of Epidemiology, Environmental Health Research Center, Research Institute for Health Development, Kurdistan University of Medical Sciences, Sanandaj, Iran

²Assistant Professor of Epidemiology, Public Health Group, School of Medical Sciences, Esfarayen Faculty of Medical Sciences, Esfarayen, Iran

³Assistant Professor of Statistic, Public Health Group, School of Medical Sciences, Esfarayen Faculty of Medical Sciences, Esfarayen, Iran

Role of satellite-based and climate projection exposures on future temperature-related respiratory diseases

Background

To explore how climate change will affect the future burden of respiratory diseases is worth understanding for public health, particularly in regions experiencing rapid environmental change. In this study, we combined hospital-based respiratory admissions with satellite and climate model data to understand how cold and heat affect respiratory diseases across future decades by the end of 21st century.

Methods

Daily hospital admissions for ICD-10 codes of J00–J99 from 2015–2022 were analyzed alongside observed meteorological data and remotely sensed land surface temperature (MOD11A1) and vegetation index (MOD13C1). Bias correction of predicted air temperature was performed using the ISIMIP statistical approach to preserve long-term climate trends. Distributed lag non-linear models were applied to establish temperature–diseases association, which were then used to project future disease burdens under three emission scenarios (RCP2.6, RCP4.5, and RCP8.5) and two population change variants. Adaptation was also represented by a 30% increase in minimum risk temperature.

Results

Cold exposure was the dominant driver of respiratory hospitalizations, in the baseline period, though its impact is projected to decrease through the century. The Attributable Fraction(AF) was statistically significant for cold in 2020-2029 with AF of 48.93 (CI 95%: 1.33, 62.83) under RCP4.5 and low variant of population growth. Conversely, heat-related burdens are expected to increase, especially under RCP8.5. However, overall uncertainty declines when green space was adjusted in the models. It should be noted that the impact of demographic change on the effect sizes was surprisingly low in our study.

Conclusion: The findings highlight decreasing impact of cold and increasing impact of heat with the potential protective role of green cover emphasizing its positive role on future public health adaptation strategies.

Keywords

Heat, Cold, Respiratory diseases, Climate change