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[Lecture]

Heat Waves in Rural Regions of Serbia: Who is the Most Vulnerable?

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Abstract: Heat waves (HWs) represent extreme climate events and one of the deadliest natural hazards globally. While the effects of HWs in urban areas have been extensively studied, their impacts on rural populations remain comparatively underexplored. This study aims to highlight the challenges faced by rural populations in Serbia during HWs and identify the most vulnerable areas from a demographic perspective. Rural population accounts for 38% of Serbia's total population and inhabits approximately 88% of its territory. It is slightly older than the urban population, with an average age of 45.25 years, compared to 43.00 years in urban areas. The difference is particularly pronounced in Southern and Eastern Serbia, where the average age of the rural population reaches 51.85 years, 7.24 years higher than that of the urban population of the same region. Zaječar, Bor, and Pirot Areas have the oldest rural populations, with ageing indices of 422.5, 405.2, and 370.1, respectively. Rural healthcare infrastructure is also less developed, with smaller settlements often lacking local medical facilities or pharmacies. The lowest numbers of physicians per 100,000 inhabitants are recorded in several predominantly rural municipalities, including Mionica (42), Nova Crnja (62), and Čoka (72), compared to the country's average of 323. Moreover, many

agricultural workers, who predominantly reside in rural areas, spend substantial amounts of time outdoors, increasing their exposure to extreme heat. During HWs, prolonged exposure to unusually high temperatures can further increase the risk of heat-related health effects, particularly among individuals with limited physiological or social capacity to cope with extreme heat. These demographic, healthcare, and occupational characteristics suggest that rural populations in Serbia may face heightened vulnerability during HWs. Future research should combine field-based temperature measurements, assessments of residents' thermal comfort, and comparisons between rural and urban environments to provide a comprehensive assessment of heat-related health risks in Serbia.

Keywords: heat-related health risks, rural regions, population ageing, Serbia

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