



SPATIAL-EPI: A SPATIAL EPIDEMIOLOGY SYSTEM FOR MONITORING POPULATION HEALTH AT HIGH RESOLUTION

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Problem

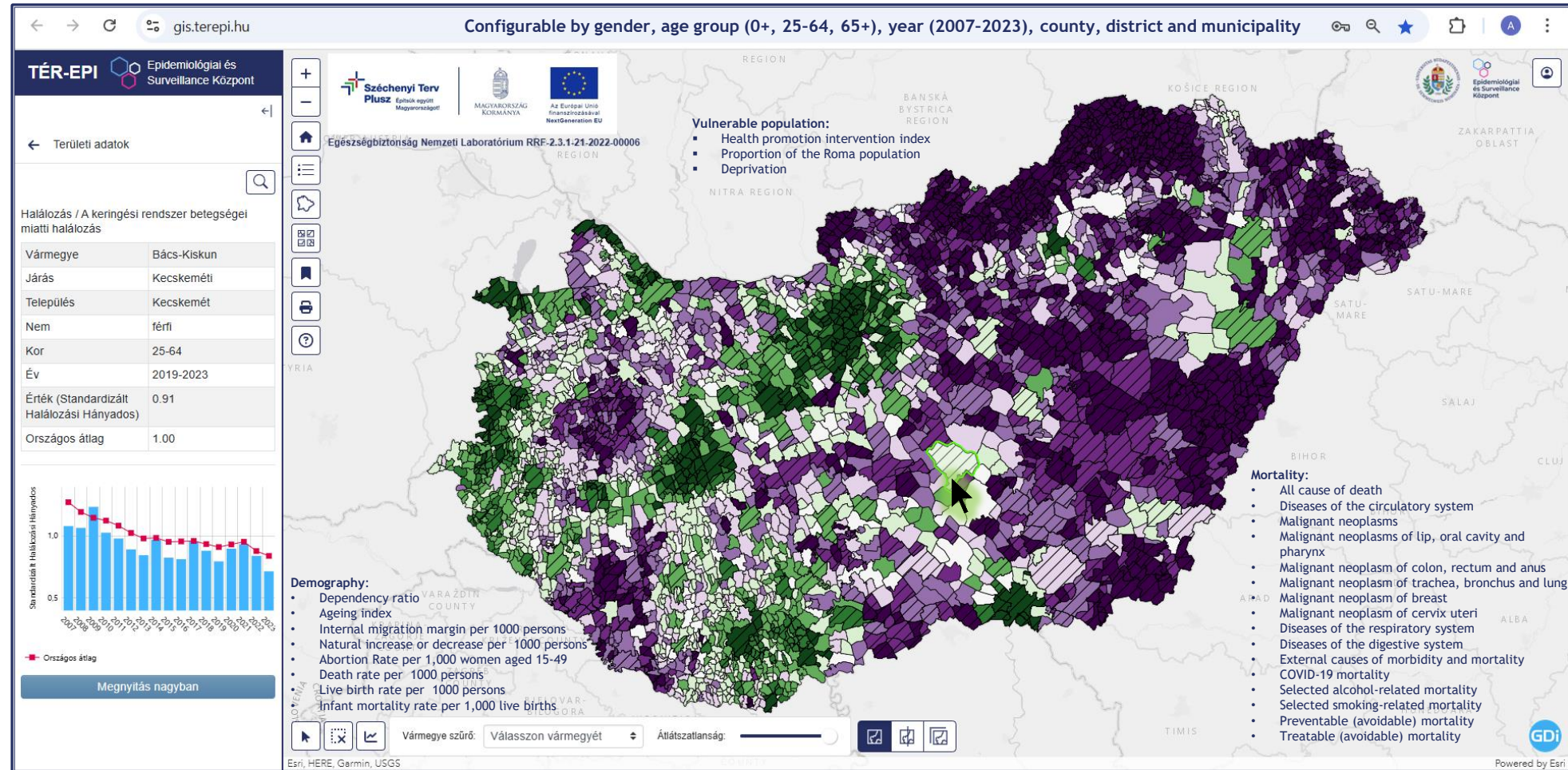
In Hungary, both preventable and treatable mortality was more than twice the EU27 average in 2021. Premature mortality from several cancers tends to follow a socioeconomic gradient, but disease mapping analyses show only partial overlap between areas of high incidence and mortality, often independent of deprivation. During the pandemic, COVID-19 mortality in the most socioeconomically deprived municipalities was 17-58% higher than the national average, while confirmed case numbers did not match mortality figures. Prior identification of vulnerable communities is crucial for the design, implementation, and evaluation of public health interventions to reduce the devastating impact of both communicable and non-communicable diseases.

Results

The Spatial-EPI IT system, using hierarchical Bayesian estimation by Integrated Nested Laplace Approximation, has been developed to describe and analyze the morbidity and mortality of the Hungarian population at high resolution, with special emphasis on socio-economic determinants and time trends, using the latest geographical information systems and spatial epidemiological methods. The spatial and time distribution of the selected indicators of major disease groups can be rapidly visualized at the county, district or municipality level by sex and age in a dynamic, interactive format.

Lessons

Spatial-EPI is an important starting point and monitoring tool for the development of local health plans. The identification of geographical areas particularly affected by avoidable mortality by highlighting areas with populations requiring special public health attention cannot be achieved without this high-resolution system, which has been developed and implemented in Hungary and can be easily adopted by countries with similar challenges.



Paying special attention to the geographical areas with most vulnerable population groups can be used to develop targeted local health plans and to monitor the effectiveness of interventions.

