

Spatiotemporal patterns of COVID-19 cases and deaths in Oklahoma and preparing for the next pandemic

Friday, October 24, 2025 9:30 AM (20 minutes)

Though the COVID-19 pandemic has reached its five-year milestone since the disease first sparked massive disruption in 2020, research continues to examine the spatial and temporal patterns of its spread as a means of using past experience to shape responses to likely future epidemics. With this in mind, the focus of this research is to provide insights and add to existing knowledge on the COVID-19 virus by analyzing the spatial and spatiotemporal patterns of COVID-19 in Oklahoma. Due to the nature of the virus, it is important to continually assess the geographic distribution of cases and deaths as well as factors that contribute to the patterns. The study uses spatial analysis methods and time series clustering to identify hotspots of COVID-19 cases and deaths in Oklahoma at the ZIP code level from the Oklahoma State Department of Health. The results show that hotspots of COVID-19 *cases* were found around Oklahoma City where higher concentrations of Blacks and Hispanics are located. In contrast, for COVID-19 *deaths*, significant hotspots occurred in rural areas where higher concentrations of Native Americans are located. Overall, the results indicate that chronic socioeconomic status inequality exacerbates poor health outcomes, with rural and higher minority areas more affected by cases and deaths, while higher income areas were similarly afflicted by cases but not deaths. Temporally, Oklahoma was affected in the second and third waves of COVID-19 due to its greater rurality and remoteness compared to other locations in the US.

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October 22, 2025

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