

Spatial distribution of COVID-19 cases, epidemic spread rate, spatial pattern, and its correlation with meteorological factors during the first to the second waves

ABSTRACT

Currently, many countries all over the world are facing the second wave of COVID-19. Therefore, this study aims to analyze the spatial distribution of COVID-19 cases, epidemic spread rate, spatial pattern during the first to the second waves in the South Sumatra Province of Indonesia. This study used the geographical information system (GIS) software to map the spatial distribution of COVID-19 cases and epidemic spread rate. The spatial autocorrelation of the COVID-19 cases was carried out using Moran's I , while the Pearson correlation was used to examine the relationship between meteorological factors and the epidemic spread rate. Most infected areas and the direction of virus spread were predicted using wind rose analysis. The results revealed that the epidemic rapidly spread from August 1 to December 1, 2020. The highest epidemic spread rate was observed in the Palembang district and in its peripheral areas (dense urban areas), while the lowest spread rate was found in the eastern and southern parts of South Sumatra Province (remote areas). The spatial correlation characteristic of the epidemic distribution exhibited a negative correlation and random distribution. Air temperature, wind speed, and precipitation have contributed to a significant impact on the high epidemic spread rate in the second wave. In summary, this study offers new insight for arranging control and prevention strategies against the potential of second wave strike.