GIS-BASED AND GEOSPATIAL ANALYSIS: MAPPING AND VISUALIZING THE TREND OF COVID-19 DATA IN SELECTED ASIAN COUNTRIES
(Analisis Berasaskan GIS dan Geospatial: Pemetaan dan Visualiasi Trend Data COVID-19 di Negara-negara Asia Terpilih)

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ABSTRACT

The outbreak of COVID-19 has caused many losses, unprecedented threats, and a change of life in many ways. The daily records of cases and other related data contain important information to reflect the severity, trend, and risk level of each country over time. Thus, this study aims to examine the trend, severity, and change of the pandemic situation in Asia over four periods. In this study, the data are collected from 48 Asian countries. The four periods are selected to represent different stages of the outbreak based on the daily records for comparison. The four periods are 6th January 2020, 6th January 2021, 6th July 2021, and 6th June 2022. The data include the daily record of confirmed cases, the number of deaths, the number of vaccinations, and the number of recoveries. Besides, this study also examines the accumulated cases up to 6th July 2022. The accumulated data includes the four data points mentioned and the severity index. The Local Indicators of Spatial Association (LISA) is applied to detect the clustering pattern and hotspot area as well as the existence of spatial effects in the data. The GIS mapping reveals that China has the most severe situation in Period 1. Nevertheless, from Periods 2 to 3, the pandemic is spreading speedily and widely over the Asian region. The deadly situation (confirmed cases, high fatality, and vaccination) is centred around Southeast Asia and West Asia. Nonetheless, with the exception of China, the situation is improving in Period 4.

Keywords: COVID-19; GIS; spatial effect; clustering; Asia; severity

ABSTRAK

Wabak COVID-19 telah menyebabkan banyak kerugian, ancaman-ancaman yang tidak pernah berlaku sebelumnya, dan perubahan corak kehidupan dalam pelbagai cara. Rekod-rekod kes harian dan data lain yang berkaitan mengandungi maklumat penting untuk mencerminkan tahap keterukan, arah aliran dan risiko setiap negara dari semasa ke semasa. Oleh itu, kajian ini bertujuan untuk mengkaji trend, keterukan, dan perubahan situasi pandemik di Asia dalam empat tempoh. Dalam kajian ini, data dikumpul daripada 48 negara-negara Asia. Empat tempoh telah dipilih untuk mewakili peringkat-peringkat wabak yang berbeza berdasarkan rekod-rekod harian untuk perbandingan. Empat tempoh tersebut ialah 6 Januari 2020, 6 Januari 2021, 6 Julai 2021, dan 6 Jun 2022. Data tersebut termasuk rekod kes harian yang disahkan, jumlah kematian, jumlah vaksinasi, dan jumlah pemulihan. Selain itu, kajian ini juga mengkaji kes-kes terkumpul sehingga 6 Julai 2022. Data terkumpul termasuk empat titik data yang dinyatakan dan indeks keterukan. Local Indicators of Spatial Association (LISA) telah digunakan untuk mengesan corak kluster dan kawasan hotspot serta kewujudan kesan-kesan spatial dalam data. Pemetaan GIS mendedahkan bahawa keadaan yang paling teruk dalam Tempoh 1 adalah di China. Walau bagaimanapun, wabak itu merebak dengan pantas dan meluas di seluruh rantau Asia dari Tempoh 2 hingga Tempoh 3. Keadaan yang teruk (kematian yang tinggi, kes yang disahkan dan vaksinasi) berkumpul di sekitar Asia Barat dan Asia Tenggara. Namun begitu, keadaan itu menjadi semakin baik dalam Tempoh 4 kecuali untuk negara China.

Kata kunci: COVID-19; GIS; kesan spatial; pengelompokan; Asia; keterukan

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