

Seasonal patterns of influenza incidence and the influence of meteorological and air pollution factors in Thailand during 2009–2019

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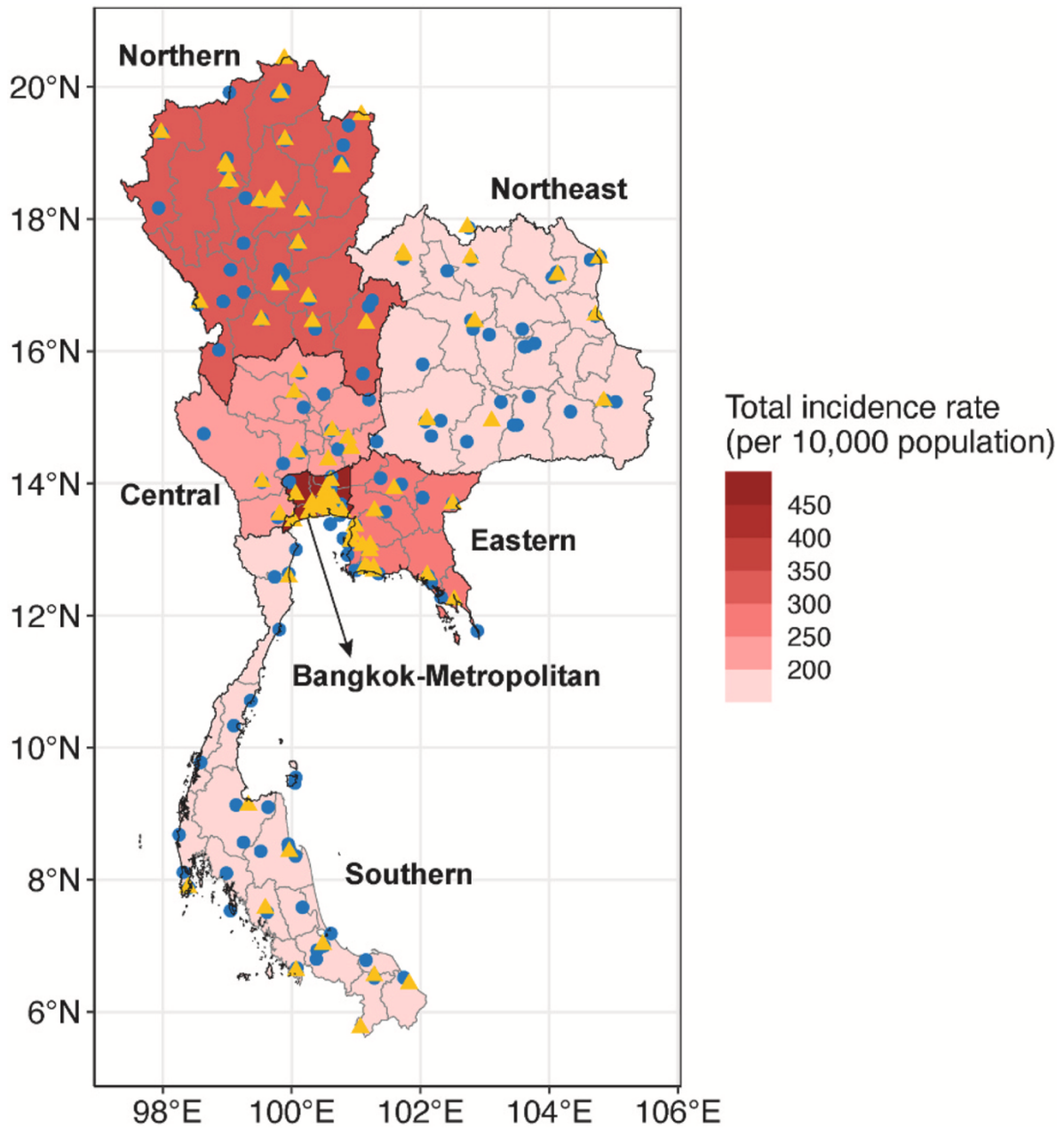
Rationale and objective: This study aims to provide a comprehensive analysis of influenza seasonality patterns across all six regions of Thailand over an 11-year period from 2009-2019 and to untangle the potential correlations between influenza incidence and various meteorological factors (temperature, relative humidity, precipitation) as well as air pollution levels (PM10, NO2, O3) in each region. Influenza remains a significant public health challenge globally, contributing substantially to morbidity and mortality, and seasonal influenza prevalence varies across regions with distinct climates. Previous studies on influenza seasonality in Thailand have been limited in scope, either focusing on only certain regions or not comprehensively examining the impact of both meteorological factors and air pollution. By employing wavelet analysis techniques, the study intends to rigorously assess the impact of these identified risk factors on influenza incidence over time and identify potential driving mechanisms behind the observed seasonal patterns. Overall, the objective is to enhance the understanding of the temporal dynamics of influenza outbreaks and how they are influenced by weather conditions and air pollution in Thailand's different regions, which can help inform public health strategies, resource allocation, and influenza control measures.

Summary: The results revealed inconsistent biannual influenza patterns, with peaks in the rainy and winter seasons in most regions except the South. The biannual cycle was prominent during 2010-2012 in all regions but disappeared during 2013-2016, re-emerging after 2016. Wavelet coherence analysis showed that relative humidity was the main influencing factor for influenza over a one-year period in all regions except the South during 2010-2012 and 2016-2018. Precipitation also drove influenza incidence over the same period in the Northeast, Central, Bangkok-Metropolitan, and Eastern regions. Additionally, PM10 concentration influenced influenza over a half-year period in some regions during certain years.

Outcome: This comprehensive study provides valuable insights into the complex temporal patterns of influenza and its associations with weather and air pollution across Thailand. The findings can guide public health strategies and resource allocation to mitigate influenza's impact in different regions based on their specific climatic and environmental contexts.

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Related SDGs goal: 3. Good health and well-being.



Graphical summary

Related publication:

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