

DOES SOCIO-ECOLOGICAL FACTOR DRIVE THE SPATIOTEMPORAL PATTERN OF PANDEMIC INFLUENZA A (H1N1) IN BRISBANE, AUSTRALIA?

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Introduction: Pandemic influenza A (H1N1) has a significant public health impact. This study aimed to examine the effect of socio-ecological factors on the transmission of H1N1 in Brisbane, Australia.

Methods: We obtained data from Queensland Health on numbers of notified daily H1N1 in Brisbane by statistical local areas (SLA) in 2009. Data on weather, socio-economic index were obtained from the Australian Bureau of Meteorology, the Australian Bureau of Statistics, respectively. A Bayesian spatial conditional autoregressive (CAR) model was used to quantify the relationship between variation of influenza and independent factors and to determine its spatiotemporal patterns.

Results: Our results show that average increase in weekly H1N1 cases were 45.04% (95% credible interval (CrI): 42.63 – 45.01%) and 23.20% (95% CrI: 16.10 – 32.58%), for a 1°C decrease in average weekly maximum temperature at a lag of 1 week and a 10mm decrease in average weekly rainfall at a lag of 1 week, respectively. An interactive effect between temperature and rainfall on H1N1 incidence was found (changes: 0.71%; 95% CrI: 0.48 – 0.98%). Auto-regression term was significantly associated with H1N1 transmission (changes: 2.5%; 95% CrI: 1.39 – 3.72). No significant association between socio-economic indexes for areas (SEIFA) and H1N1 was observed at SLA level.

Conclusion: Our results demonstrate that average weekly temperature and rainfall were substantially associated with H1N1 incidence at a SLA level. The ecological factors seemed to have played an important role in H1N1 transmission cycles in Brisbane, Australia.