

Impact of Ambient Air Pollutants on Influenza-like illness, Influenza A and Influenza B: A Nationwide Time-Series Study in China

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Abstract

Influenza constitutes a critical respiratory infection that imposes significant public health burdens. The precise influence of these pollutants on influenza activity remains unclear. This study aimed to investigate the effects of different air pollutants on the incidence of influenza-like illness (ILI), influenza A (Flu A), and influenza B (Flu B) in China based on nationwide data on air pollution and the influenza data from 554 sentinel hospitals across 30 provinces and municipalities from 2014 to 2017. Distributed Lag Nonlinear Model (DLNM) was employed to discern the lagged effects amid the concentrations of six distinct air pollutants, namely PM_{2.5}, PM₁₀, O₃, CO, SO₂, and NO₂, and the incidence of ILI, Flu A, as well as Flu B. Our analysis indicated that there was generally no distinction in the effects of air pollutants on the incidence of ILI, Flu A, and Flu B, although variations existed in terms of the specific level of risk associated with each of these categories. Specifically, elevated levels of PM_{2.5}, PM₁₀, CO, SO₂, and NO₂ were predominantly associated with an increased risk of influenza. In contrast, the effect of O₃ concentration on influenza was bidirectional whereby it promoted influenza outbreaks at low and high levels.

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