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PM2.5 in Beijing – Temporal pattern and its association with influenza

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Background: Air pollution in Beijing, especially $PM_{2.5}$, has received increasing attention in the past years. Despite Beijing being one of the most polluted cities in the world, there has still been a lack of quantitative research regarding the health impact of $PM_{2.5}$ on the impact of diseases in Beijing. In this study, we aimed to characterize temporal pattern of $PM_{2.5}$ and its potential association with human influenza in Beijing.

Methods: Based on the data collected on ¬¬hourly ambient $PM_{2.5}$ from year 2008 to 2013 and on monthly human influenza cases from 2008 and 2011, we investigated temporal patterns of $PM_{2.5}$ over the five-year period and utilized the wavelet approach to exploring the potential association between $PM_{2.5}$ and influenza.

Results: Our results found that ambient $PM_{2.5}$ pollution was severe in Beijing with $PM_{2.5}$ concentrations being significantly higher than the standards of the World Health Organization, the US EPA, and the Chinese EPA in the majority of days during the study period. Furthermore, $PM_{2.5}$ concentrations in the winter heating seasons were higher than those in non-heating seasons despite high variations. We also found significant association between ambient $PM_{2.5}$ peak and human influenza case increase with a delayed effect (e.g. delayed effect of $PM_{2.5}$ on influenza).

Conclusions: Ambient $PM_{2.5}$ concentrations were significantly associated with human influenza cases in Beijing, which have important implications for public health and environmental actions.

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