

# ENVIRONMENTAL FACTORS AND MORTALITY RISKS ASSOCIATED INFLUENZA

**Lin Yang**, *The University of Hong Kong, Hong Kong Special Administrative Region, China*

**King Pan Chan**, *The University of Hong Kong, Hong Kong Special Administrative Region, China*

**Ping Yan Chan**, *Southern Medical University, China*

**Jian Feng He**, *Guangdong Provincial Center for Disease Control and Prevention, China*

**Chun Quan Ou**, *Southern Medical University, China*

**JS Malik Peiris**, *The University of Hong Kong, Hong Kong Special Administrative Region, China*

**Chit Ming Wong**, *The University of Hong Kong, Hong Kong Special Administrative Region, China*

**Background and Aims:** The subtropical and tropical regions exhibit a distinct seasonality of influenza incidence from the temperate regions, and the mechanism behind it remains unclear. Environmental factors have been related to the transmission and survival of influenza viruses but no studies have ever explored the role of environmental factors on regulating severity of influenza infection.

**Methods:** We applied a Poisson regression model to the mortality data of two Asian metropolitan cities located at the subtropical zone, Guangzhou and Hong Kong. Interaction between environmental factors (temperature, relative and absolute humidity) and influenza virus activity on their effects on mortality was assessed by Poisson regression models with product terms of environmental factors and influenza variables. The influenza associated excess mortality risks were also calculated for each period with different levels of temperature and humidity.

**Results:** Significant interactions ( $p < 0.05$ ) between absolute humidity and influenza were consistently found for mortality risks of all-cause and cardiorespiratory in both cities, with an increasing trend from low to high absolute humidity periods, but no significant interaction was found for pneumonia and influenza deaths. An increasing trend was also observed over strata of relative humidity, but the interaction between relative humidity and influenza was significant only in a few outcomes. The results for temperature were less consistent between two cities, and the interaction between temperature and influenza was only significant for cardiorespiratory mortality in Hong Kong.

**Conclusions:** The results suggest that environmental factors not only affect transmission of influenza viruses but also could be involved in pathogenesis of virus infections. The higher relative risks of influenza associated cardiorespiratory deaths in the hot and humid days highlight a need for people with chronic conditions to take extra caution against influenza in the subtropics.