Natural Sciences 自然科學

Controlling the spread of influenza
# 控制流感的傳播

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Mathematical modelling of the factors that cause multiple waves of influenza should lead to enhanced strategies for controlling the spread of the virus.

透過數學建模分析多次大流感爆發的成因，有助完善控制病毒傳播的策略。

The 1918 influenza pandemic, one of the worst-ever natural disasters, caused the deaths of hundreds of thousands of people. Pandemics such as this seem to be characterized by multiple waves of incidence, but an explanation of how and why such waves occur has remained elusive.

Dr He Daihai, Assistant Professor at the Department of Applied Mathematics, in collaboration with Canadian researchers, developed a model to describe how multiple waves of incidence arise during an epidemic. The model considered three factors: schools opening and closing, temperature changes during the outbreak and changes in human behaviour in response to the outbreak. All three factors were found to be important, but changes in people's behaviour in response to an outbreak had the greatest effect on the development of multiple waves.

The findings of the study, recently published in *Proceedings of the Royal Society of Biological Sciences*, advance our understanding of how the influenza virus spreads at the population level. This knowledge should pave the way for the development of improved strategies to control and prevent the spread of influenza.
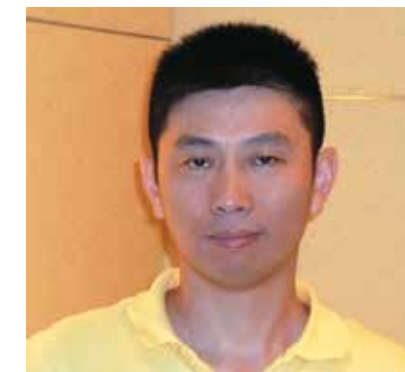
九一八年的流感大爆發是人類史上最嚴重的自然災禍之一，全球死亡人數以千萬計。短時間內多次爆發是這類流行性疾病的特徵，唯這現象的過程及成因迄今仍未有定案。

理大應用數學系助理教授何岱海博士與加拿大的研究人員合作，透過精密的數學建模，分析導致流感多次爆發的三項因素，包括學校開放與關閉、流感大爆發期間的溫度變化及人類經歷流感大爆發時的行為轉變。研究發現此三項因素均同等重要，但以人類行為轉變對引致流感多次爆發的影響最大。

這次研究的成果加深了人類對流感病毒傳播的認識，並有助改善現有策略，更有效控制流感病毒的傳播。此研究成果近期已在《英國皇家學會生物科學期刊》(Proceedings of the Royal Society of Biological Sciences) 刊登。❖