



[Viruses](#). 2019 Mar; 11(3): 207.

Published online 2019 Mar 1

Low Temperature and Low UV Indexes Correlated with Peaks of Influenza Virus Activity in Northern Europe during 2010–2018

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Abstract

With the increasing pace of global warming, it is important to understand the role of meteorological factors in influenza virus (IV) epidemics. In this study, we investigated the impact of temperature, UV index, humidity, wind speed, atmospheric pressure, and precipitation on IV activity in Norway, Sweden, Finland, Estonia, Latvia and Lithuania during 2010–2018. Both correlation and machine learning analyses revealed that low temperature and UV indexes were the most predictive meteorological factors for IV epidemics in Northern Europe. Our in vitro experiments confirmed that low temperature and UV radiation preserved IV infectivity. Associations between these meteorological factors and IV activity could improve surveillance and promote development of accurate predictive models for future influenza outbreaks in the region.