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# Temporal Association between ILI and the Winter Holiday Break, U.S. 2004-2012

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## Objective

To explore the relationship between influenza-like illness observed by influenza out-patient network and winter holiday breaks in US.

## Introduction

Decreasing contact between infectious and susceptible people in community settings may reduce influenza transmission. Examining the temporal relationship between the winter holiday break and seasonal influenza activity can provide insight of alternative contact patterns on influenza spread.

## Methods

We examined weekly influenza-like illness (ILI) rates by HHS region in the United States from 2003–2014. We used time series analyses to compare observed and predicted ILI rates for the last week of each year and the first week of each new year using the Auto-Regressive Integrated Moving Average method.

## Results

Most (72/90; 80%) observed ILI rates for the last week of the year were higher than predicted, and 12 among these 72 were even higher than the upper bound of 95% prediction interval. In contrast, most (76/90; 84%) observed ILI rates for the first week of the year were lower than predicted, with 14 out of 76 lower than the lower bound of 95% prediction interval.

## Conclusions

Most frequently, the last week in December had higher observed than predicted ILI rates, and the first week of January had lower observed than predicted ILI rates. Further research is needed to determine whether these observed differences are due to changes in social mixing patterns or in other factors, such as healthcare-seeking behavior.

## Keywords

influenza; time series; winter holiday breaks

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