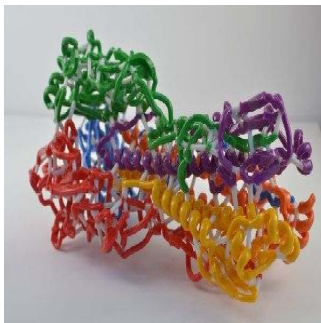## Algorithm Identifies Onset of Local Flu Outbreaks

Predicting the beginning of influenza outbreaks is notoriously difficult, but researchers have devised a new method that makes it easier for hospitals and public health departments to determine the onset of elevated influenza activity at the community level. The researchers say their algorithm or statistical technique, called Above Local Elevated Respiratory Illness Threshold (ALERT), will help to signal that influenza transmission is rising in a given region, and will assist public health officials and healthcare providers with prevention and control measures.

Details of the new open-source, publicly available tool designed by biostatistician Nicholas Reich, of the University of Massachusetts at Amherst, with Dr. Trish Perl of the Johns Hopkins University School of Medicine and others in Florida, Colorado and New York, appear in the journal *Clinical Infectious Diseases*.

Hospital epidemiologists and others responsible for public health decisions do not declare the start of flu season lightly, Reich notes. In hospitals, a declaration that flu season has begun necessitates many extra precautions and procedures such as added gloves, masks and gowns, donning and doffing time, special decontamination procedures, increased surveillance and reduced visitor access.

"There's also healthcare worker fatigue to consider," Reich adds. "It's a lot to ask of healthcare workers to continue these important preventative measures when they just aren't seeing a lot of flu around their workplace."

ALERT should not require doctors, hospitals, or public health departments to collect any new data, but instead uses routinely collected information such as weekly counts of laboratory-confirmed influenza A cases, the authors explain.

To develop the new metric, Reich's team used years of surveillance data of confirmed flu cases at two large hospitals in Denver and Baltimore. They retrieved weekly counts of confirmed influenza A cases at the 414-bed Children's Hospital of Colorado and the 200-bed Children's Hospital at Johns Hopkins from 2001 through 2013.

The team used 2001 through 2011 data to create the algorithm, then tested its performance in the 2011-12 and 2012-13 seasons in the two locations. At Johns Hopkins, 71 and 91 percent respectively of all reported cases fell in the ALERT period, while at Colorado Children's the ALERT period captured 77 and 89 percent of all cases, the team reported. Based on the findings, "the ALERT algorithm performs well at predicting the beginning and end of a seasonal period of increased influenza incidence," the authors said.

To use the algorithm, hospital epidemiologists upload as many years of their own institution's historical flu data as possible to the web-based ALERT applet and then "tune the dials" that control the algorithm to customise the results for their purposes, Reich explains. "The more years of data you have, the better," he adds. "We have applied it in places with only three to five years of data and it's still been a useful tool, but the more years you have the more accurate it will be."

The algorithm helps users choose a threshold number of new cases per week that will signal the start of the season. However, as the researchers point out, choosing the right threshold poses a challenge. "To guide the user to an evidence-based decision, the ALERT algorithm summarises data from previous years as if each of several thresholds had been applied." For each threshold, the tool calculates and reports a set of summary metrics, from which the user can select one that meets their local needs.

Based on local historical data inputs, the tool determines a time window or "ALERT period" when elevated incidence is estimated to occur.

"People will look at the output from ALERT and do a cost-benefit analysis. We don't try to do this for them, but the algorithm can help you to estimate the threshold at which you should start to think about declaring that flu season has started," Reich explains. "And, very importantly, your staff can have a sense that it will not go on forever, but that for the next 11 or 12 weeks, for example, you'll be taking the extra precautions."

Source: EurekAlert.org
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