Medical Xpress

When should flu trigger a school shutdown?

November 4 2009

As flu season approaches, parents around the country are starting to face school closures. But how bad should an influenza outbreak be for a school to shut down? A study led by epidemiologists John Brownstein, PhD, and Anne Gatewood Hoen, PhD of the Children's Hospital Boston Informatics Program, in collaboration Asami Sasaki of the University of Niigata Prefecture (Niigata, Japan), tapped a detailed set of Japanese data to help guide decision making by schools and government agencies. The analysis was published by the Centers for Disease Control and Prevention in the November issue of *Emerging Infectious Diseases*.

"Currently many U.S. schools don't have specific or consistent algorithms for deciding whether to shut down," says Brownstein. "They don't always use quantitative data, and it may be a political or fear-based decision rather than a data-based one."

Sasaki, Hoen and Brownstein analyzed flu absenteeism data from a Japanese school district with 54 elementary schools. Tracking four consecutive flu seasons (2004-2008), they asked what pattern of flu absenteeism was best for detecting a true school outbreak -- balanced against the practical need to keep schools open if possible.

"You'd want get a school closed before an epidemic peaks, to prevent transmission of the virus, but you also don't want to close a school unnecessarily," explains Brownstein. "We also wanted an algorithm that's not too complex, that could be easily implemented by schools."

A school outbreak was defined as a daily flu absentee rate of more than

10 percent of students. After comparing more than two dozen possible scenarios for closing a school, the analysis suggested three optimal scenarios:

1. A single-day influenza-related absentee rate of 5 percent

2. Absenteeism of 4 percent or more on two consecutive days

3. Absenteeism of 3 percent or more on three consecutive days

The scenarios #2 and #3 performed similarly, with the greatest sensitivity and specificity for predicting a flu outbreak (i.e., the fewest missed predictions and the fewest "false positives.") Both gave better results than the single-day scenario (#1). The researchers suggest that scenario #2 (with a sensitivity of 0.84 and a specificity of 0.77) might be the preferred early warning trigger, balancing the need to prevent transmission with the need to minimize unnecessary closures.

"Our method would give school administrators or government agencies a basis for timely closure decisions, by allowing them to predict the escalation of an outbreak using past absenteeism data," says Hoen. "It could be used with data from schools in other communities to provide predictions. It would leave decision-making in the hands of local officials, but provide them with a data-driven basis for making those decisions."

Japan makes a good model for studying influenza in schools because it closely monitors school absenteeism due to flu, requires testing for the flu virus in students who become ill, and has a track record of instituting partial or complete school closures during outbreaks. However, Brownstein cautions that the scenarios might play out differently in the U.S. than they would in Japan, mainly because students here aren't

required to be tested for influenza as they are in Japan, so it's less certain whether they actually have the [flu](). Also, the vaccination status of students in this study was unknown.

Last spring, during the early days of the H1N1 influenza pandemic, the CDC recommended first a 7-day school closure, then a 14-day closure after appearance of the first suspected case. Later, as more became known about the extent of community spread and disease severity, the CDC changed the recommendation to advise against school closure unless absentee rates interfered with school function. CDC's current guidelines ([http://www.cdc.gov/h1n1flu/schools/schoolguidance.htm](), 10/21/09) don't provide a specific algorithm, but state that "the decision to selectively dismiss a school should be made locally," in conjunction with local and state health officials, "and should balance the risks of keeping the students in school with the social disruption that school dismissal can cause." When the decision is made to dismiss students, CDC recommends doing so for 5 to 7 calendar days.

More information: Sasaki A, et al. Evidenced-based tool for triggering [school]() closures during influenza outbreaks, Japan. Emerg Infect Dis 2009 Nov. Available from [www.cdc.gov/EID/content/15/11/1841.htm]()

Source: Children's Hospital Boston ([news]() : [web]())