

Running the Numbers

*A Periodic Feature to Inform North Carolina Healthcare Professionals
about Current Topics in Health Statistics*

*From the State Center for Health Statistics, NC Department of Health and Human Services
<http://www.schs.state.nc.us/SCHS>*

Influenza Surveillance

For health care providers, the start of flu season is often heralded by an increased number of patients complaining of fever, cough, and aches asking the question, "Do I have the flu?" For public health departments, the onset of flu season is often heralded by calls from health care providers asking the question, "Is flu reportable?" The answer to this question is a qualified "yes."

In North Carolina, any fatal case of influenza in a child (< 18 years of age) is reportable by health care providers to the health department. In addition, any infection with a novel influenza virus, such as the current avian influenza H5N1 strain that has caused human cases in multiple countries since 2003, is also reportable. Influenza outbreaks in closed settings such as schools or long-term care facilities are also reportable. The total number of influenza cases is not reportable and neither are fatal cases of influenza in persons 18 years of age or older (other than on a death certificate).

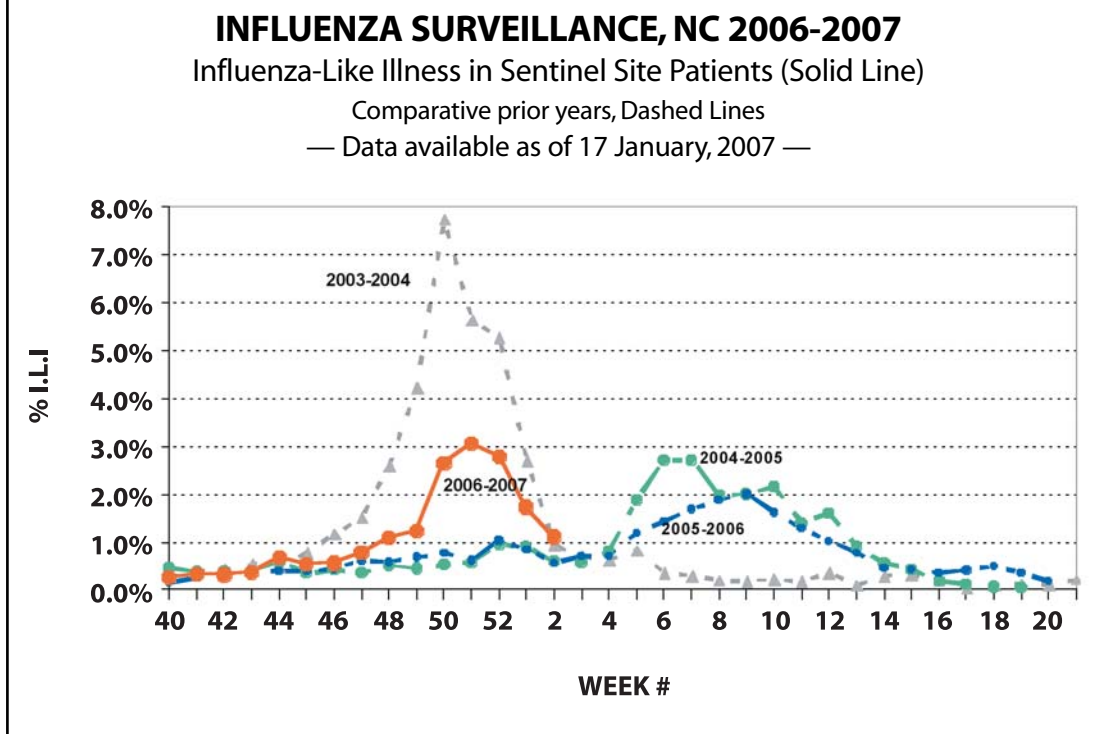
In North Carolina, routine influenza surveillance is conducted from October through May of each year. Although it does not provide a count of all influenza cases, it can be used to determine when and where influenza is circulating, the types of influenza viruses that are causing illness, and the level of influenza activity present in the state.

Disease-based surveillance is comprised of a network of voluntary providers who serve as sentinel sites for influenza activity in a variety of outpatient settings. For the 2006-2007 season, 74 providers representing 45 counties volunteered to serve as sentinel providers. Of these sentinel sites, 34 sites are private health care providers, 19 sites are county health departments, 15 sites are college and university student health centers, and 6 sites are hospital-based clinics. Sentinel providers record the number of patients they see each week with an influenza-like illness (ILI), which is defined as a fever of 100° F or greater and one respiratory symptom such as cough or sore throat. Sentinel providers also submit a count of the total number of patients seen each week. This gives a proportion of visits that are attributed to ILI on a weekly basis throughout the flu season, and enables public health officials to monitor influenza activity across the state.

Figure 1 shows data on influenza activity from the sentinel provider network over several influenza seasons. The weeks of the influenza season are assigned a number, with the start of the flu season in October represented by week #40 and the end of the flu season in early May represented by week #20. The current influenza season is shown in red. For the week ending with January 12 (week #2), approximately 1.1% of all visits to the sentinel provider sites was for an ILI. This is down from a peak of 3% in week #51. Figure 1 also illustrates that every influenza season is different, both in severity as well as timing. For example, flu activity began peaking earlier (December) in the current flu season compared with the two previous seasons in which flu activity peaked in February or March (2005-2006 shown in blue and 2004-2005 shown in green).

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Figure 1.
Influenza Surveillance in the Sentinel Provider Network, 2003-2004 to 2006-2007

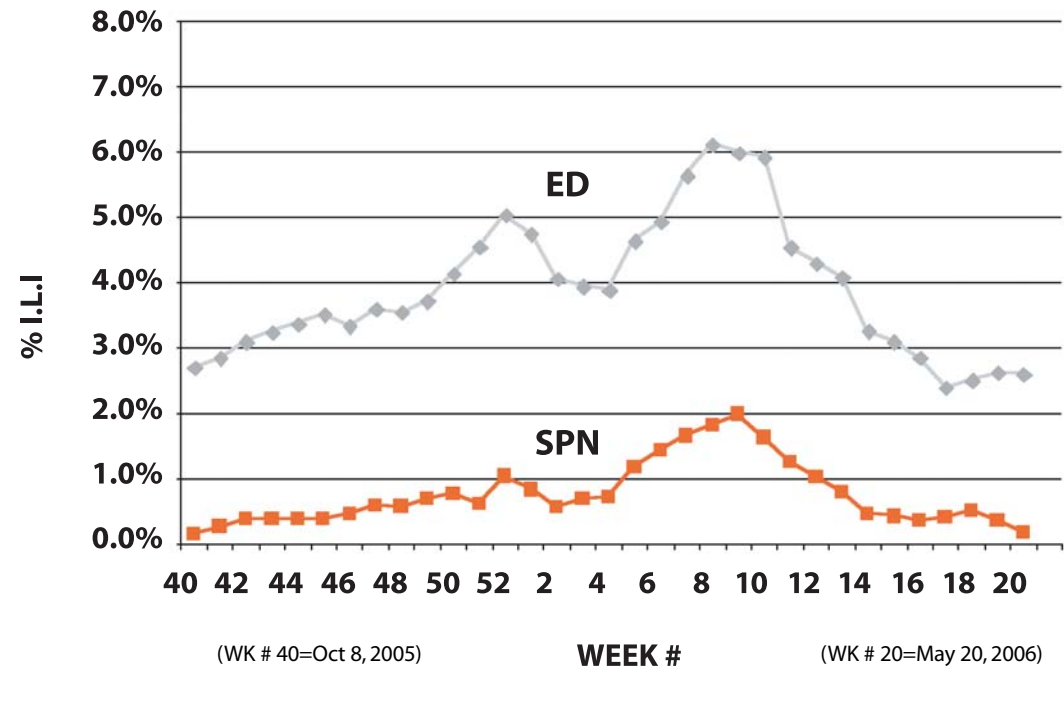


Beginning in the 2005-2006 influenza season, disease-based influenza surveillance was also conducted in hospital emergency departments (EDs) by monitoring ILI using the North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT) system. NC DETECT currently monitors real-time data from 90 hospital-based emergency departments throughout the state. The system categorizes visits into syndromes in real time in order to detect unexpected cases and outbreaks earlier in their course than traditional disease-based surveillance would allow.

The case definition for ILI in hospital EDs is broader than the ILI case definition used in the sentinel provider network. Emergency department visits are grouped into syndromes by analyzing the chief complaint and, when available, the triage notes and initial ED temperature. ILI cases must include any case with the term “flu” or “influenza” or have at least one fever term and one influenza-related symptom. The hospital ED data were compared with the sentinel provider network data for the 2005-2006 flu season (Figure 2).

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Figure 2.
Influenza-Like Illness Surveillance in North Carolina, 2005-2006 Influenza Season.
Comparative Trend between Two Surveillance Systems: Sentinel Provider Network (SPN) and Hospital Emergency Department (ED)



Although the patient populations, severity of illness, and case definitions for ILI are different in these two surveillance systems, it is important to note that the trends in ILI activity are well correlated. The use of NC DETECT as one method of monitoring ILI activity is validated by the existing sentinel provider network data. The trends for the first half of the 2006-2007 flu season are also well correlated.

In the event of an influenza pandemic, there will be significant challenges to influenza surveillance. Current systems of influenza surveillance will likely become overwhelmed, and flexibility will be essential in adapting current systems to meet the demands of tracking the pandemic across North Carolina. It is expected that the voluntary sentinel provider network will not be able to report weekly data regarding the percentage of visits for ILI because this data collection is still done the old-fashioned way: by hand. Syndromic surveillance for ILI in emergency departments, on the other hand, may be a viable option since these data are collected electronically as patients are being triaged through the emergency department. Another advantage of NC DETECT over the sentinel provider network is that it provides the opportunity for immediate surveillance of a new condition. This could apply to an outbreak of a novel strain of influenza in which the current case definition for ILI may need to be modified to capture cases. Expansion of NC DETECT to all hospitals in North Carolina with licensed acute care 24/7 emergency departments is underway.

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