

Influenza

Agent: Influenza virus; Types A, B and (rarely) C cause human disease.

Mode of Transmission: Directly from person-to-person, primarily through inhalation of droplets released through coughing or sneezing. Less commonly, the virus can be transmitted by indirect contact with an object or surface containing influenza and then touching one's mouth or nose.

Signs/Symptoms: Fever, headache, muscle pain, fatigue, sore throat and cough; influenza can also lead to pneumonia, especially in those with underlying medical conditions (e.g., lung or heart disease).

Prevention: Annual vaccination is the primary prevention strategy and should be obtained yearly; antiviral medications are sometimes used with high-risk populations (e.g., nursing home residents) to prevent illness or lessen illness severity. Transmission may be reduced by washing hands frequently or using alcohol-based hand-sanitizers; avoiding touching the eyes, nose, and mouth with contaminated hands; and covering the nose and mouth with a tissue or the bend of the elbow when coughing or sneezing.

Other Important Information: The influenza virus changes slightly from year to year (antigenic drift), making it necessary to prepare a new vaccine each year. Periodically, the virus will change to form a completely new subtype (antigenic shift), which can lead to pandemics.

Influenza Surveillance

The three seasonal influenza virus subtypes that circulated during the 2011-2012 season included A(H3), 2009 H1N1 (the subtype responsible for the 2009 pandemic), and B.

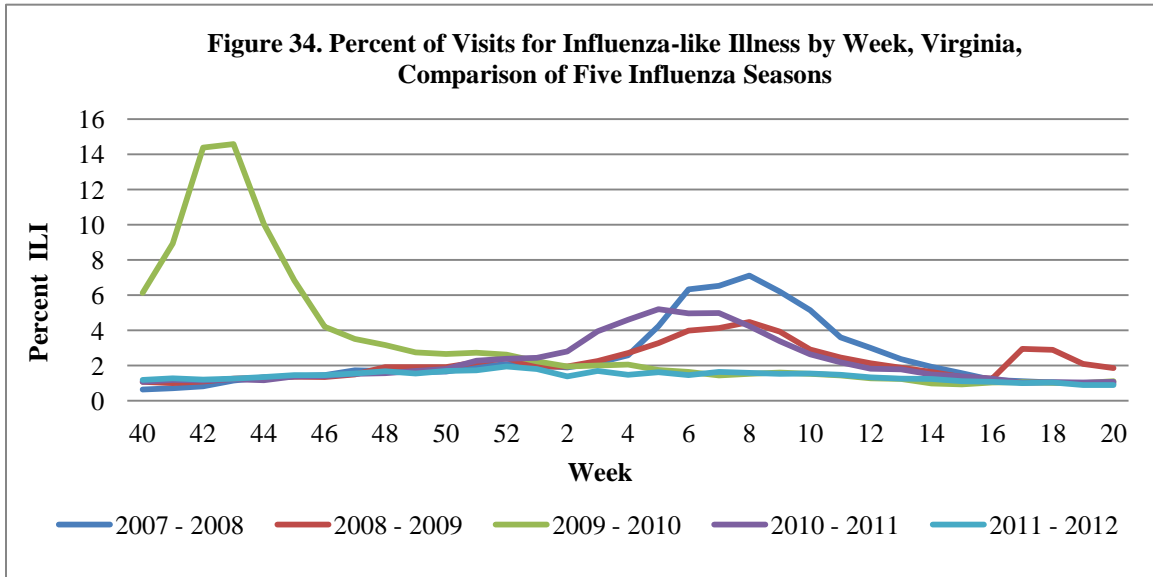
Influenza surveillance is conducted throughout the year in Virginia. However, efforts are most intensively focused during the period of highest disease activity, which normally begins in early October (week 40) and ends in late May (week 20). In Virginia, the 2011-2012 influenza season began later, was shorter in duration, and milder in severity than recent seasons. Surveillance efforts in Virginia do not count every individual with influenza but instead monitor indicators of illness within the community. For the 2011-2012 influenza season, data sources included visits for influenza-like illness to hospital emergency departments and urgent care centers, laboratory reports, evaluations of outbreak investigations, influenza-associated pediatric deaths, and school absenteeism data. These data sources are used to determine weekly influenza levels, provide insight on the severity of illness, and characterize influenza virus subtypes circulating in the community.

Influenza-like Illness Surveillance

VDH receives information regarding patient visits to emergency departments and urgent care facilities for influenza-like illness (ILI) symptoms. ILI symptoms include a complaint of fever and cough or fever and sore throat. Other illnesses may show similar symptoms, but the strategy has proven to be a reliable indicator of influenza activity during flu season. During the 2011-2012 influenza season, 96 emergency department and urgent care facilities provided data to VDH for surveillance monitoring.

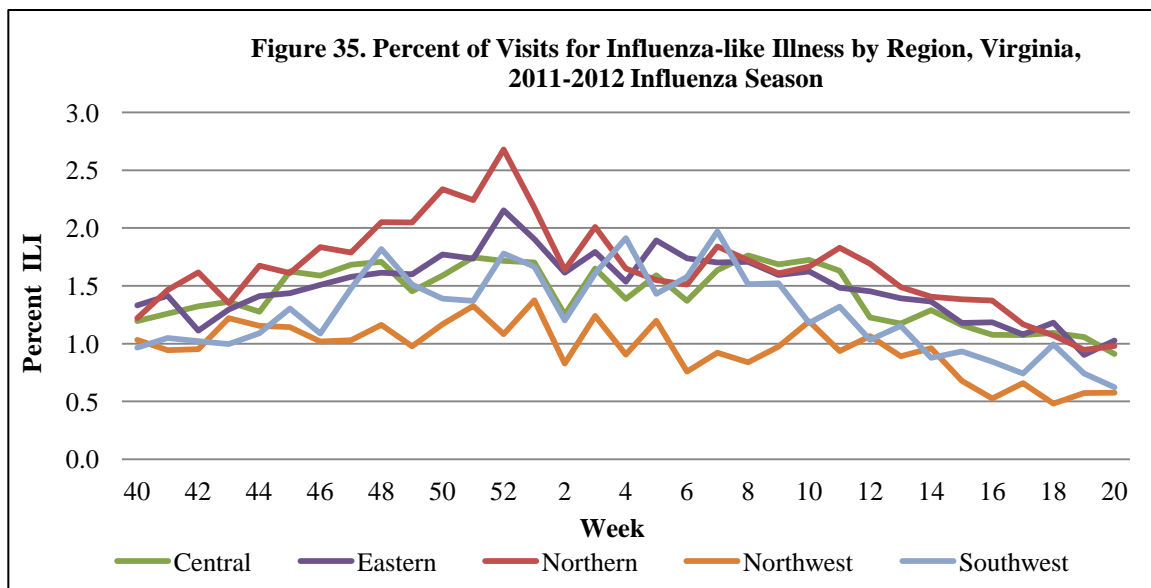
According to the Centers for Disease Control and Prevention (CDC), the 2011-2012 season was less severe than several prior seasons. Nationally, the weekly percentage of outpatient visits for ILI, as reported by the U.S. Outpatient ILI Surveillance Network (ILINet), peaked in mid-March (week 11) at 2.4%. In Virginia, the proportion of patient visits for ILI peaked at 2.0% during the week ending December 31, 2011 (week 52). ILI activity during the 2011-2012 season contrasted dramatically with the ILI activity seen during the influenza pandemic in 2009-2010 and other recent non-pandemic seasons (Figure 34). Peak activity during the 2011-2012 season occurred earlier than the other non-pandemic

years, which peaked between weeks 5 and 8. Throughout the 2011-2012 season, the percent of visits for ILI was lower than the pandemic and non-pandemic seasons. During the pandemic, ILI activity peaked early in the season, reaching 14.6% of other visits during week 43.



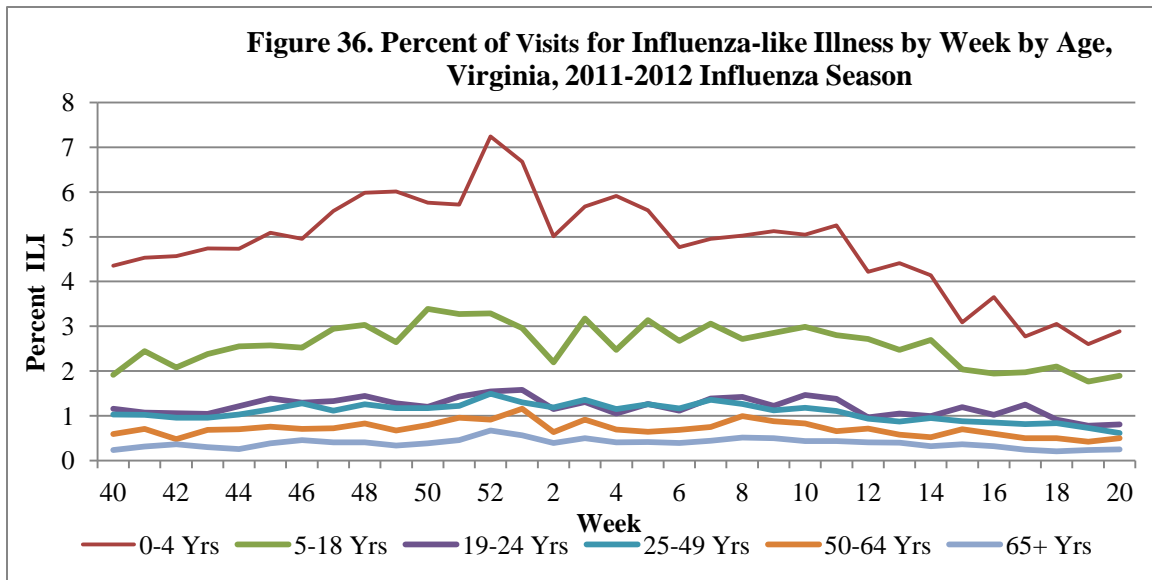
Influenza-like Illness by Region

In Virginia, ILI activity varied by region throughout the 2011-2012 season, although peak activity occurred in most regions in late December/early January (weeks 52 to 1) (Figure 35). In general, ILI reached higher levels in the eastern, northern and central regions than in the southwest and northwest regions. The northern region experienced the highest proportion of visits for ILI (2.7%) during the week ending December 31, 2011 (week 4). The eastern, northwest, southwest, and central regions experienced the following peaks: 2.2% (week 52), 1.4% (week 1), 2.0% (week 7), and 1.8% (week 8) respectively.



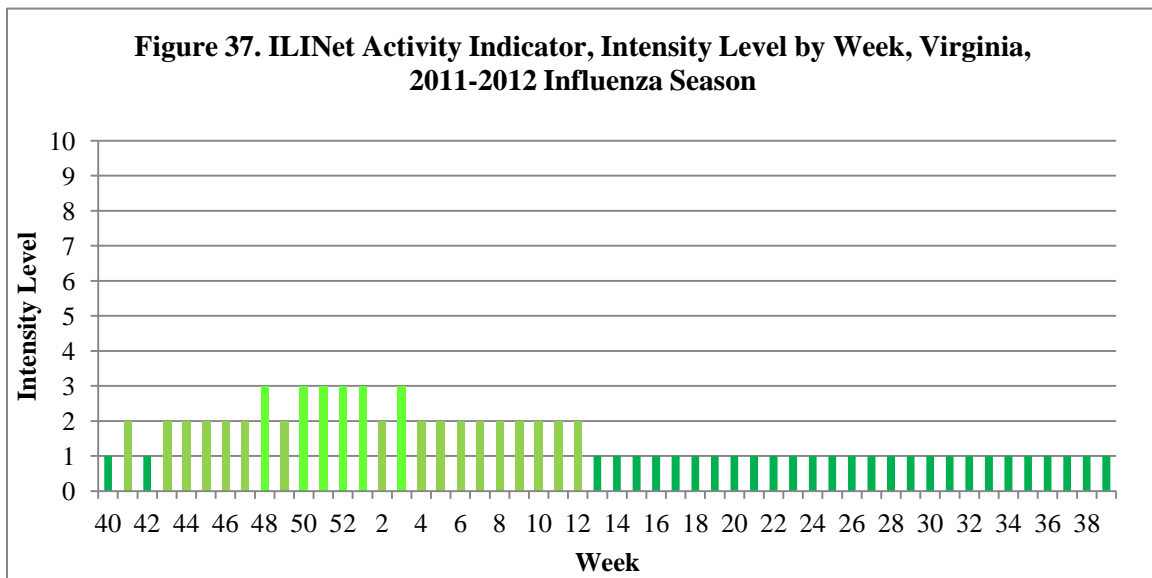
Influenza-like Illness by Age

Analyzing ILI activity by age provides additional insight into disease patterns. While influenza vaccination efforts have often targeted the elderly due to concerns over complications of infection, the youngest age groups show the highest proportions of health care visits for ILI. Consistent with other flu seasons, the youngest age groups show the highest proportions of health care visits for ILI. In contrast, the smallest proportion of visits for ILI occurred in the 65 years and older age group (Figure 36).



Influenza Intensity Levels

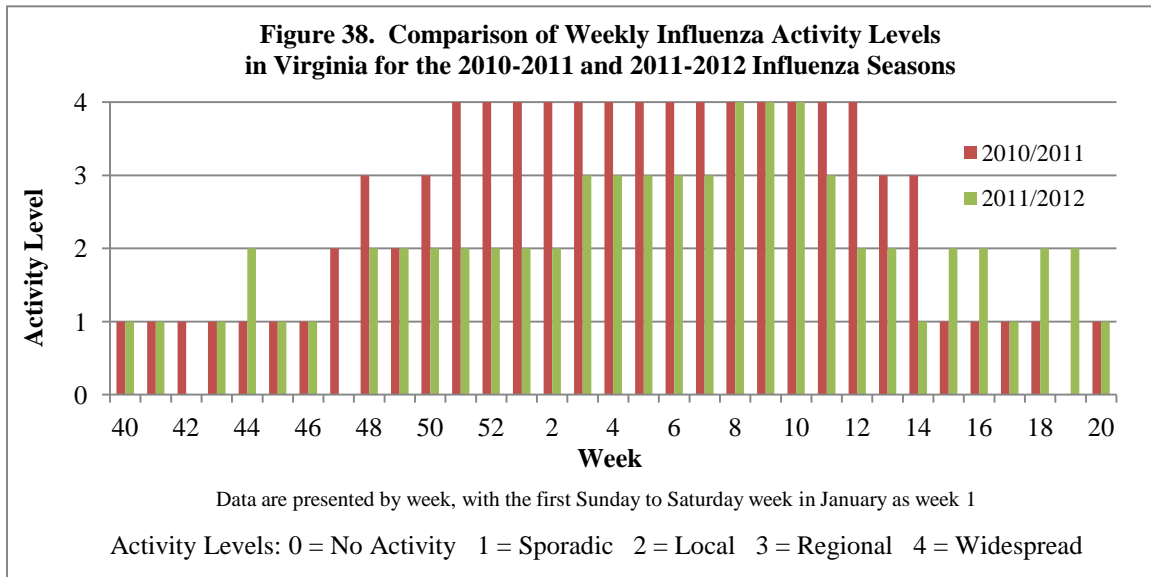
During the 2011-2012 influenza season, CDC reported weekly influenza intensity levels (ranging from 1 to 10) on a map by state. This measure was introduced during the 2010-2011 season and is calculated by comparing the percent of patient visits due to ILI for that week compared to the average proportion of ILI visits that occurred during a designated baseline period for which there is minimal or no influenza virus circulation. During the 2011-2012 season, influenza intensity did not reach above a minimal level (levels 1-3). Virginia's intensity levels are presented by week in Figure 37.



Influenza Activity Levels

Virginia follows CDC guidelines to describe the geographic distribution of influenza activity. The weekly activity level is based on ILI data, laboratory findings, and outbreak occurrences, and is classified into the following categories: no activity, sporadic, local, regional, or widespread. The levels are not indicators of the severity of influenza illness but instead serve as a gauge for the geographic distribution of influenza activity around the state. Six weeks of ILI data, collected during the summer months of July through September, are used to establish baseline thresholds for the five health planning regions. ILI activity is considered elevated when a region exceeds its threshold.

The 2011–2012 influenza season began with a level of sporadic influenza activity in early October, and remained at sporadic or no activity for four weeks (weeks 40 to 44). From early December (week 48) to mid-January (week 2), activity remained at local. Widespread activity occurred during the weeks ending February 25, 2011 through March 10, 2012, corresponding to week 8 through week 10 (Figure 38). Three weeks represents the shortest duration and latest initiation of widespread influenza activity in the past 15 seasons. In the prior season (2010-2011), influenza activity became widespread in late December (week 51) and maintained at this level for 14 weeks.



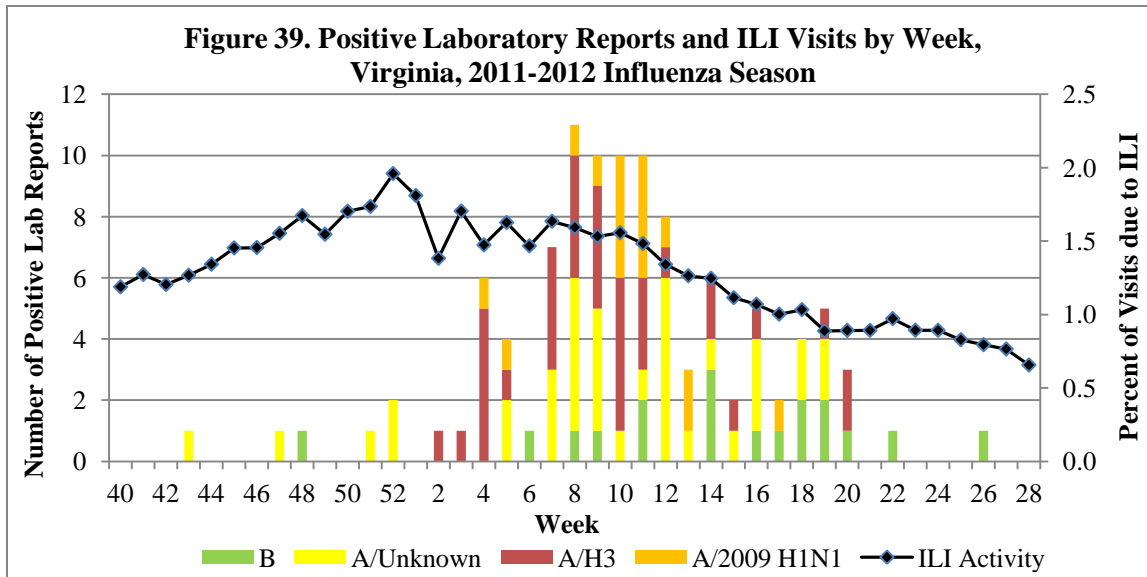
Laboratory Surveillance

Laboratory surveillance for influenza uses findings from three testing procedures: DFA (direct fluorescent antibody), PCR (polymerase chain reaction) and viral culture. Rapid antigen tests are not included. Information comes from specimens submitted by sentinel providers, specimens from outbreaks, influenza reporting by private laboratories, and findings from Virginia facilities participating in the National Respiratory and Enteric Virus Surveillance System (NREVSS).

Sentinel providers include private physicians and medical facilities located throughout the Commonwealth. Statewide representation is achieved through the efforts of health districts to enlist providers from their area. During the influenza season, sentinel providers submit specimens from patients with ILI to the Virginia Division of Consolidated Laboratory Services (DCLS) for analysis. Regular

sentinel providers were asked to submit two specimens per month from patients exhibiting influenza-like illness and sentinel providers participating in the Influenza Incidence Surveillance Project (described later) submitted specimens from the first ten patients with ILI each week.

During the season, influenza A(unk), A(H3), 2009 H1N1, and B were all circulating in the state, as shown in Figure 39. It is important to note that A(unk) does not represent a new or unknown strain, but only the inability of confirmatory tests being used to distinguish between types of influenza A. Laboratory tests indicated that 83.2% of positive influenza findings were influenza A (all subtypes) and 16.8% were influenza B. The predominant strain circulating in Virginia varied by week and region.



Influenza Outbreaks

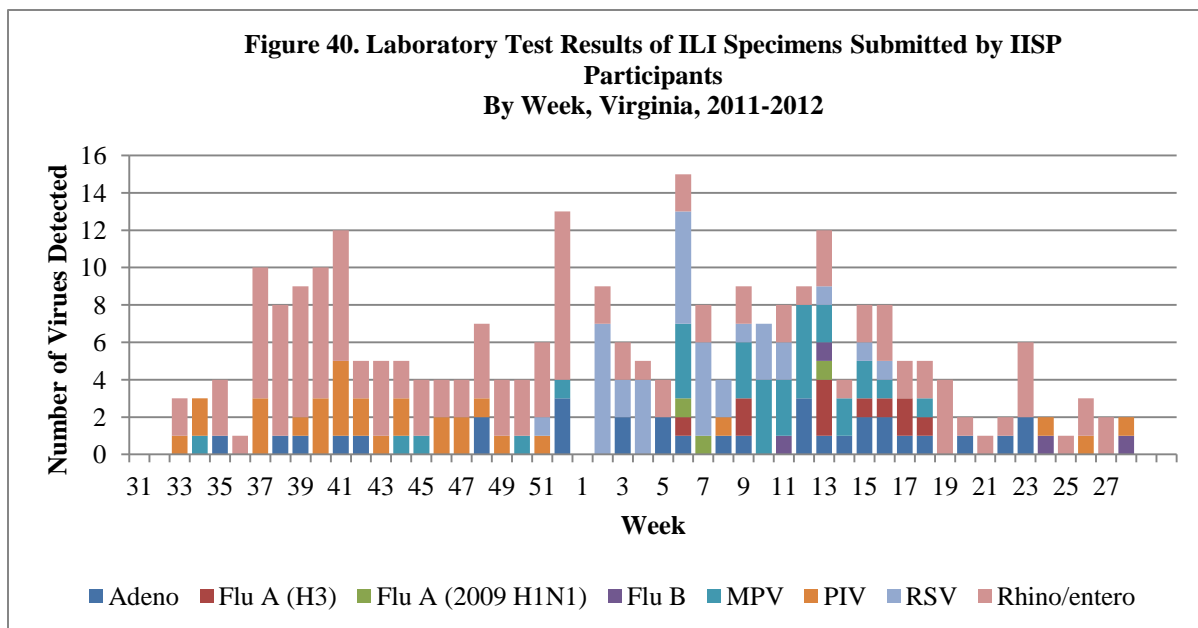
Seventeen outbreaks of influenza were reported to VDH during the 2011-2012 season. Specimens from 13 of these influenza outbreaks tested positive for the influenza virus, confirming 10 as influenza A associated, two as influenza B associated, and one as unspecified subtype. The first confirmed outbreak was reported in late January 2012 (week 4) and occurred in an assisted living facility (ALF) in the eastern region. Overall, outbreaks occurred in eight schools (K-12), three ALFs, one college, one pre-school facility, one medical facility, one retirement center, and two other facilities. By region, eight outbreaks were reported from the northern region, three outbreaks each from the central and southwest regions, two from the eastern region, and one from the northwest region. The number of cases associated with the outbreaks ranged from 4 to 194 individuals (median: 17), with a total of 13 reported hospitalizations.

Influenza-associated Deaths

Virginia disease reporting regulations require physicians and directors of medical care facilities to report suspected or confirmed influenza-associated deaths in children less than 18 years of age to allow monitoring of this severe outcome of influenza illness. One pediatric influenza-associated death was reported to VDH during the 2011-2012 season (week 40, 2011 through week 20, 2012). This death occurred in a preschool-aged child (0-4 years) from the southwest region

Influenza Incidence Surveillance Project

The Influenza Incidence Surveillance Project (IISP) is a special surveillance activity that was initiated during the 2010-2011 flu season and continued for the 2011-2012 season. The project provides valuable insights into the circulating respiratory viruses that cause ILI symptoms. Six participating sentinel providers submitted data each week, by age group, on the number of patients seen and the number with ILI. Specimens were collected from the first 10 patients seen each week with ILI symptoms and evaluated with a respiratory panel at DCLS. During the 2011-2012 project period, influenza was detected in 7% (n=18) of the positive specimens. When influenza was identified, the predominant circulating strain was A(H3) (Figure 40). Rhinovirus/enterovirus was detected nearly every week of the project period and was responsible for the majority of respiratory illness activity during late 2011 (weeks 33 to 52). Respiratory syncytial virus (RSV) was the predominant respiratory virus circulating in early 2012 (weeks 2 to 7).



Abbreviations noted: Adeno=adenovirus; MPV=metapneumovirus; PIV=parainfluenza; RSV=respiratory syncytial virus; Rhino/entero= rhinovirus/enterovirus

School Absenteeism

School absenteeism surveillance was added to influenza surveillance in Virginia during the 2009-2010 pandemic season, and continues because of the insights it provides. Information on absenteeism is voluntarily submitted by school divisions on a daily basis and made available to the health districts to identify emerging problems and monitor potential influenza activity in their communities. Centrally, it is evaluated by region and school level (elementary, middle and high school) for unusual patterns. During the 2011-2012 season, 40 school divisions provided absenteeism data for 911 schools. While school absenteeism provides a general, but not influenza-specific, measure of illness, it was useful for monitoring illness activity and identifying schools with possible outbreaks during the influenza season.