

Influenza

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

Mode of Transmission: Person-to-person primarily through inhalation of droplets released through coughing or sneezing.

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; antiviral medications are sometimes used with high-risk populations (e.g., nursing home residents) to prevent illness. Transmission may be reduced by frequent hand washing or using alcohol-based hand-sanitizers; avoidance of 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 2010-2011 season included A(H3), 2009 H1N1, and B. 2009 H1N1, which was responsible for the 2009 pandemic, is now considered a seasonal virus.

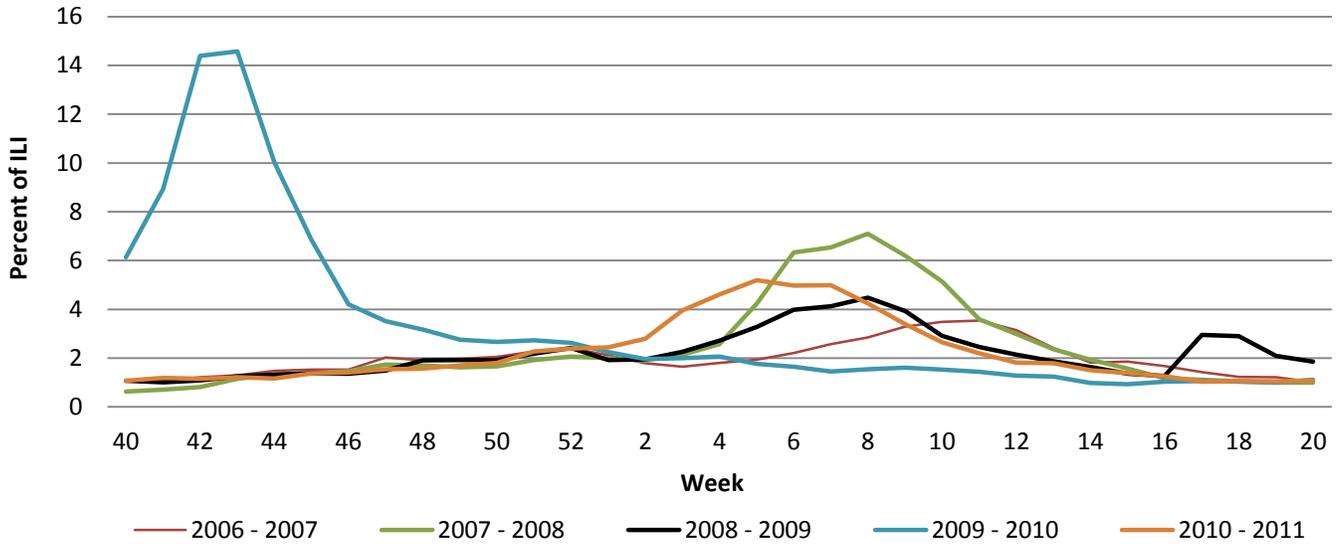
Influenza surveillance is conducted throughout the year in Virginia. However, efforts are most intensively focused during the period of highest disease activity, which normally begins in early October (week 40) and ends in late May (week 20). In Virginia, the 2010-2011 influenza season began in early October and peaked in early February before declining by late April. Surveillance efforts in Virginia do not count every individual with influenza but instead monitor indicators of illness within the community. For the 2010-2011 influenza season, data sources included reporting from hospital emergency departments and urgent care centers, laboratory reports, evaluations of outbreak investigations, pediatric deaths associated with influenza 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 2010-2011 influenza season, 95 emergency department and urgent care facilities provided data to VDH for surveillance monitoring.

In the 2010-2011 season, the proportion of patient visits for ILI peaked at 5.2% during the week ending February 5, 2011 (week 5). When compared to two previous flu seasons (excluding the 2009-2010 pandemic season), peak activity occurred approximately three weeks later in February (week 8). The percent of patient visits for ILI gradually declined to 1.1% by the week ending May 21, 2011 (week 20), which is consistent with a typical flu season (Figure 34). ILI activity during the 2010-2011 season contrasted dramatically with the ILI activity seen during the influenza pandemic in 2009-2010. During the pandemic, ILI activity peaked much earlier in the season reaching 14.6% of visits during week 43, and declined to 1.7% of visits by week 5.

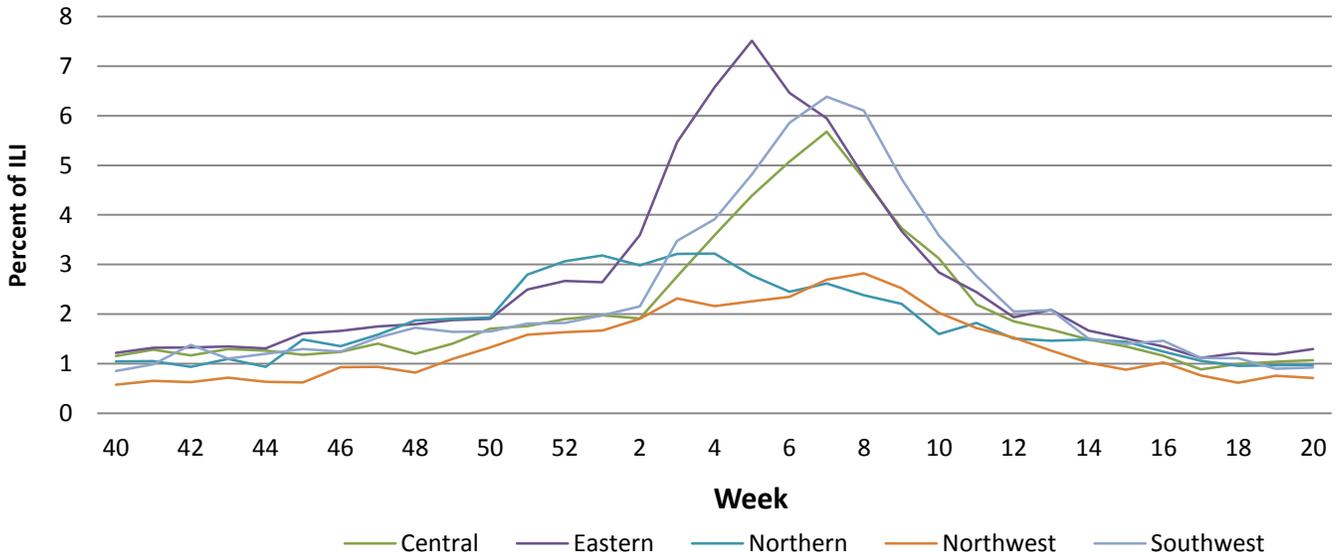
Figure 34. Percent of Visits for Influenza-like Illness by Week, Virginia, Comparison of Five Influenza Seasons



According to the Centers for Disease Control and Prevention (CDC), the 2010-2011 season was less severe than the 2009-2010 pandemic season, but more severe than the 2008-2009 influenza season. Nationally, the weekly percentage of outpatient visits for ILI, as reported by the U.S. Outpatient ILI Surveillance Network (ILINet), peaked in mid-February at 4.6%.

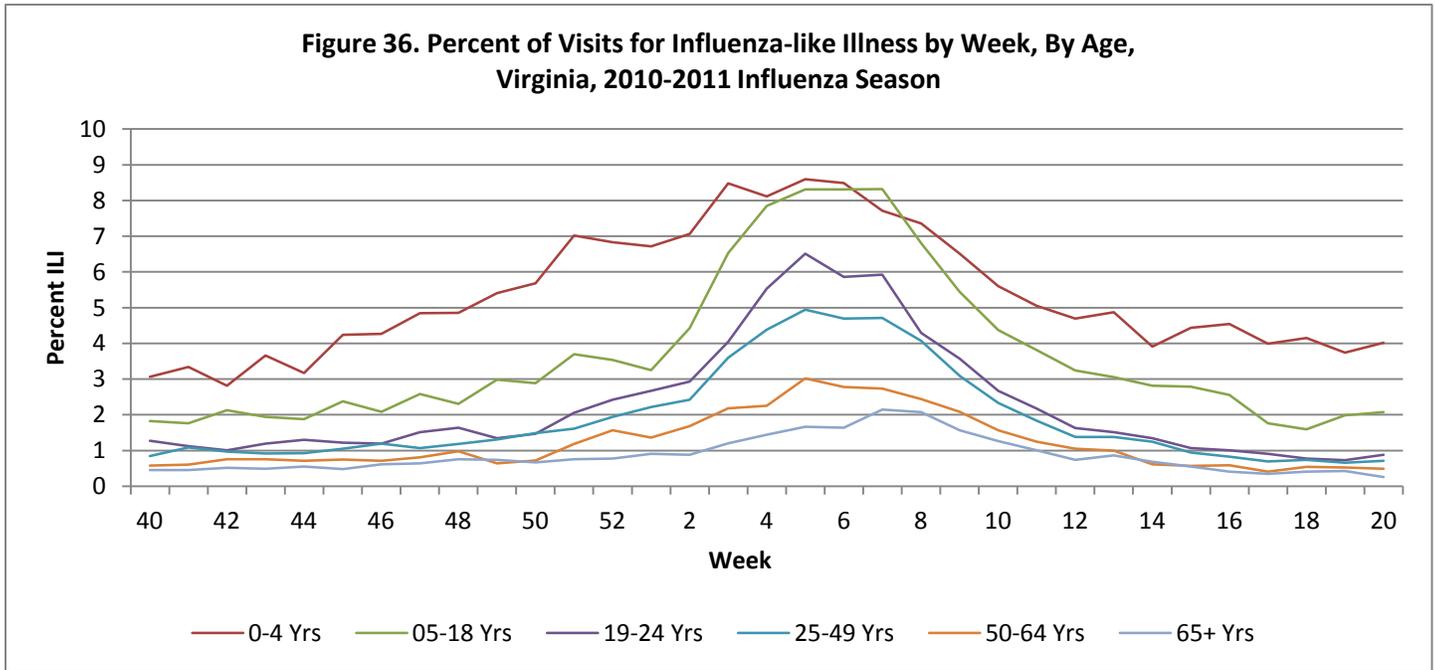
ILI activity varied by region throughout the 2010-2011 season. Although peak activity occurred in all regions during late January to February (Figure 35), ILI reached much higher levels in the eastern, northern and central regions than in the southwest and northwest regions. The northern region peaked first, during the week ending January 29, 2011 (week 4) at 3.2% of visits. The highest percent of ILI visits occurred in the eastern region, which peaked during week ending February 5, 2010 (week 5) at 7.5%. Subsequently, the central, southwest, and northwest regions peaked in the following weeks at 5.6%, 6.4%, and 2.8%, respectively.

Figure 35. Percent of Influenza-like Illness by Region, Virginia, 2010-2011 Influenza Season



Influenza-like Illness by Age

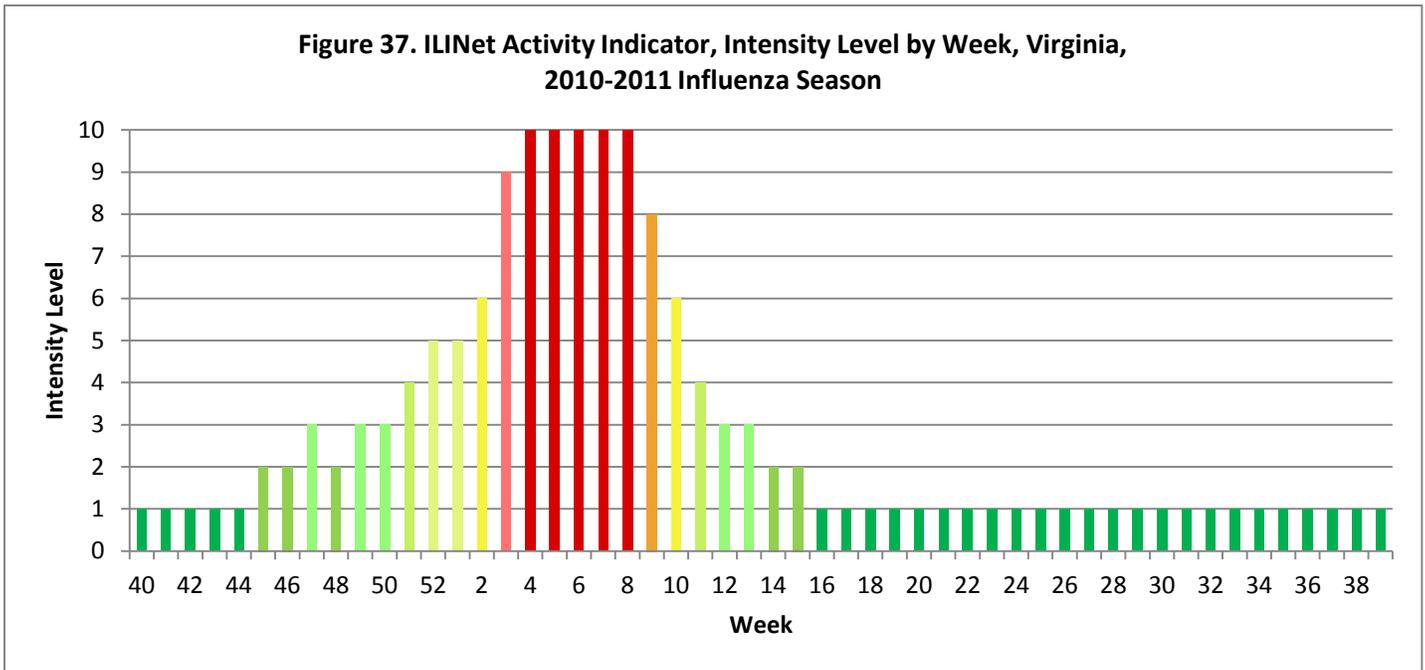
Analyzing ILI activity by age provides additional insight into disease patterns. While influenza vaccination efforts have often targeted the elderly due to concerns over complications of infection, the youngest age groups show the highest proportions of health care visits for ILI. Consistent with other flu seasons, the largest proportion of visits for ILI occurred in the 0-4 age group. In contrast, the smallest proportion of visits for ILI occurred in the 65 years and older age group, as shown on Figure 36 below.



Influenza Intensity Levels

During the 2010-2011 influenza season, CDC introduced a new measure intended to reflect the intensity of influenza activity. The weekly intensity level utilizes the percent of patient visits for ILI data. The intensity levels (ranging from 1 to 10) are calculated using the percent of patient visits due to ILI 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. Each week, CDC presents the intensity levels on a map by state. Virginia's intensity levels are presented by week in Figure 37.

Figure 37. ILINet Activity Indicator, Intensity Level by Week, Virginia, 2010-2011 Influenza Season

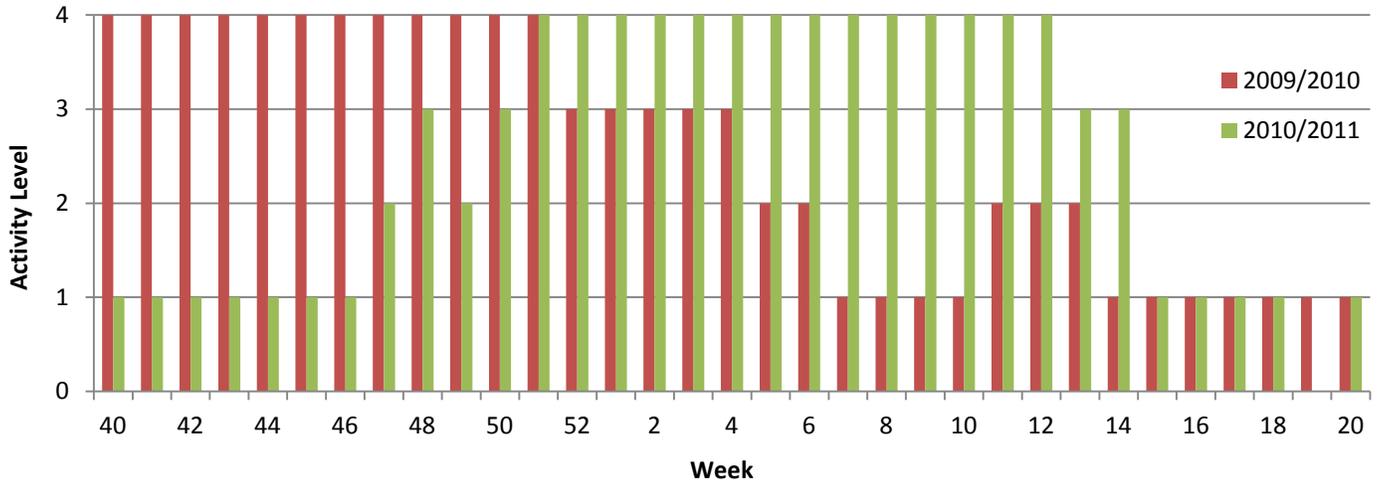


Influenza Activity Levels

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 2010–2011 influenza season began with a level of sporadic influenza activity in early October, corresponding with weeks 40-46. Activity during the 2010–2011 season increased to local activity during week 47, and the following week increased to the level of regional. Widespread activity occurred during the weeks ending December 25, 2010 through March 26, 2011, corresponding to week 51 through week 12 (Figure 38). This differs from the 2009–2010 pandemic season, during which influenza activity was already at widespread during week 40 and maintained this level until week 51, after which it began to taper.

Figure 38. Comparison of Weekly Influenza Activity Levels in Virginia for the 2009-2010 and 2010-2011 Influenza Seasons



Data are presented by week, with the first Sunday to Saturday week in January as week 1
 Activity Levels: 0 = No Activity, 1 = Sporadic, 2 = Local, 3 = Regional 4 = Widespread

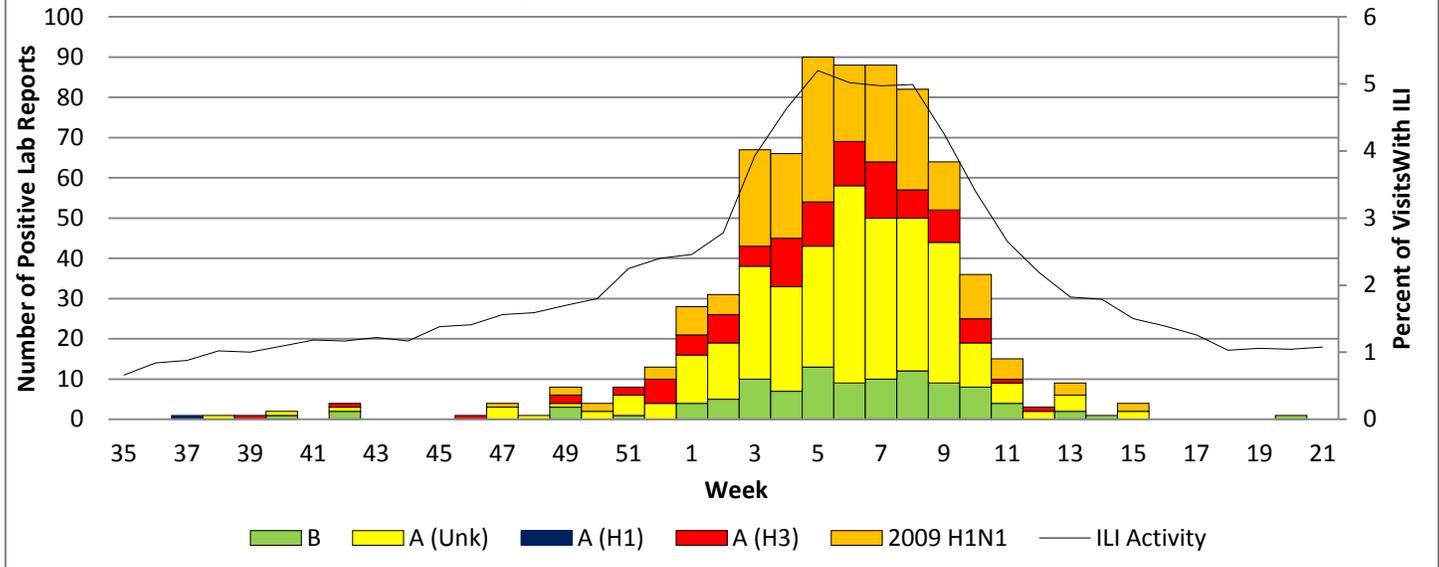
Laboratory surveillance

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 peak of 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.

Figure 39. Positive Laboratory Reports and ILI Visits by Week, Virginia, 2010-2011 Influenza Season



Laboratory tests indicated that 85.6% of positive influenza findings were influenza A (all subtypes) and 14.4% were influenza B. The predominant strain circulating in Virginia varied by week, region, and even between districts within the same region.

Influenza Outbreaks

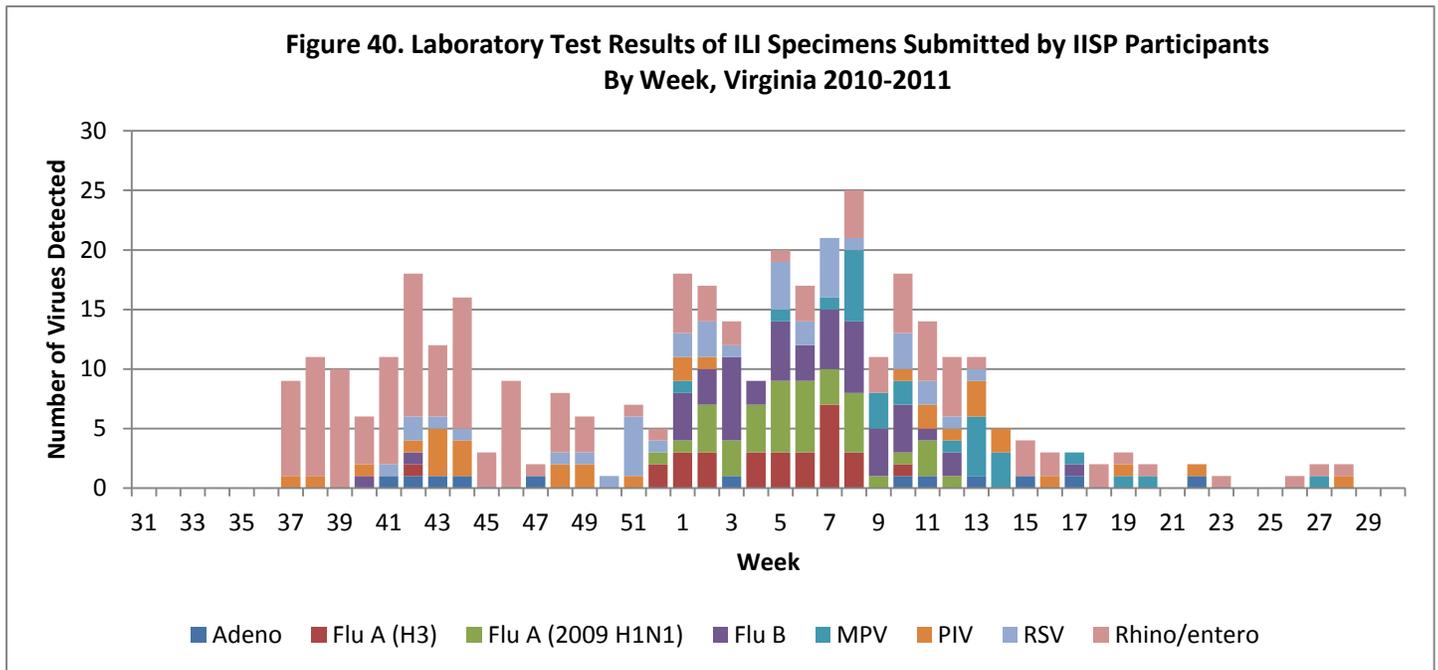
Thirty-four outbreaks of influenza were reported to VDH during the 2010-2011 season. Specimens from 20 of these influenza outbreaks tested positive for the influenza virus, confirming 19 as influenza A associated and one as influenza B associated. The first confirmed outbreak was reported in early December 2010 (week 48) and occurred in an assisted living facility (ALF) in the northwest region. Overall, outbreaks occurred in 15 ALFs, 13 nursing homes, 2 daycare facilities, 2 correctional facilities, 1 school and 1 medical facility. By region, ten outbreaks were reported from the southwest region, nine from the northwest region, six outbreaks each from the central and eastern regions, and three from the northern region. The number of cases associated with the outbreaks ranged from 4 to 98 individuals, with a total of 17 reported hospitalizations.

Influenza-associated Deaths

Influenza-associated deaths in children less than 18 years of age are required to be reported by physicians and directors of medical facilities in Virginia to allow monitoring of this severe outcome of influenza illness. Five pediatric influenza-associated deaths were reported to VDH during the 2010-2011 season. Four occurred in school-aged children (5-12 years) and one occurred in a preschool aged-child (0-4 years). The cases were distributed throughout the state, with two from the northern region and single cases from the eastern, central and southwestern regions.

Influenza Incidence Surveillance Project

The Influenza Incidence Surveillance Project (IISP) was a new surveillance activity initiated during the 2010-2011 flu season. The project provides valuable insights into the circulating respiratory viruses that cause ILI symptoms. Four participating sentinel providers submitted data each week, by age group, on the number of patients seen, the number with acute respiratory illness, 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. The data generated provided useful information on the circulation of influenza and other conditions causing ILI during the 2010-2011 project season (Figure 40.)



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 has been continued because of the insights it provides. Information on absenteeism is 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 2010-2011 season, 38 school divisions provided absenteeism data for 744 schools. While school absenteeism provides a general, but not influenza-specific, measure of illness, it was very useful for monitoring illness activity and identifying schools with possible outbreaks during the influenza season.