Division of Acute Disease Prevention and Emergency Response
Center for Acute Disease Epidemiology

Iowa Influenza Surveillance Network (IISN)

Influenza-like Illness (ILI) and Other Respiratory Viruses
2012-2013 Season Summary Report

Summary

The Iowa Influenza Surveillance Network (IISN) is a collaborative effort between the Iowa Department of Public Health (IDPH) and its many partners, including the Centers for Disease Control and Prevention (CDC), Council of State and Territorial Epidemiologists (CSTE), local public health departments, clinical laboratories, hospitals, healthcare providers, clinics, medical examiners, and schools. Influenza surveillance tracks influenza activity, virus type and strain, age group impacted, outbreaks, and severity of the seasonal influenza viruses. During the 2012-2013 influenza season, more than 250 surveillance sites reported data to IDPH.

The 2012-2013 influenza season in Iowa began earlier, peaked earlier, and was more severe than recent influenza seasons, particularly for people 65 years and older. The first case of seasonal influenza was confirmed by the State Hygienic Laboratory (SHL) in September, 2012. Activity increased through November and December, and peaked in late December. Iowa reported "widespread" statewide influenza activity, the highest level of reporting to the CDC, for 11 straight weeks from the week ending December 8, 2012 to the week ending February 16, 2013 (MMWR Weeks 49-7). By comparison, only two weeks were reported "widespread' during the mild 2011-2012 flu season. Influenza A (H3N2) was most commonly identified overall in 2012-13, but influenza B and, to a lesser extent; influenza A (2009 H1N1) viruses were also identified.

National influenza activity

Compared with recent influenza seasons, the 2012-13 season in the U.S. began earlier, peaked early, and also had a higher percentage of outpatient visits for influenza-like illness, higher rates of hospitalizations, and more deaths attributed to pneumonia and influenza. The age group with the highest hospitalization rate was among people 65 years and older, accounting for more than half of all reported influenza-associated hospitalizations. Influenza A (H3) viruses predominated in the United States overall, followed by influenza B viruses, while pH1N1 viruses were identified rarely. The majority of all influenza viruses, in specimens sent to CDC for further antigenic characterization, was similar to the components of the 2012-13 Northern Hemisphere vaccine. Influenza antiviral resistance patterns were similar to the previous season with widespread resistance to the adamantane class of drugs (amantadine and rimantadine) among influenza A viruses, and rare sporadic cases of resistance to oseltamivir or zanamivir. This season is an example of the serious public health toll that influenza can take, and underscores the importance of influenza vaccination and treatment.

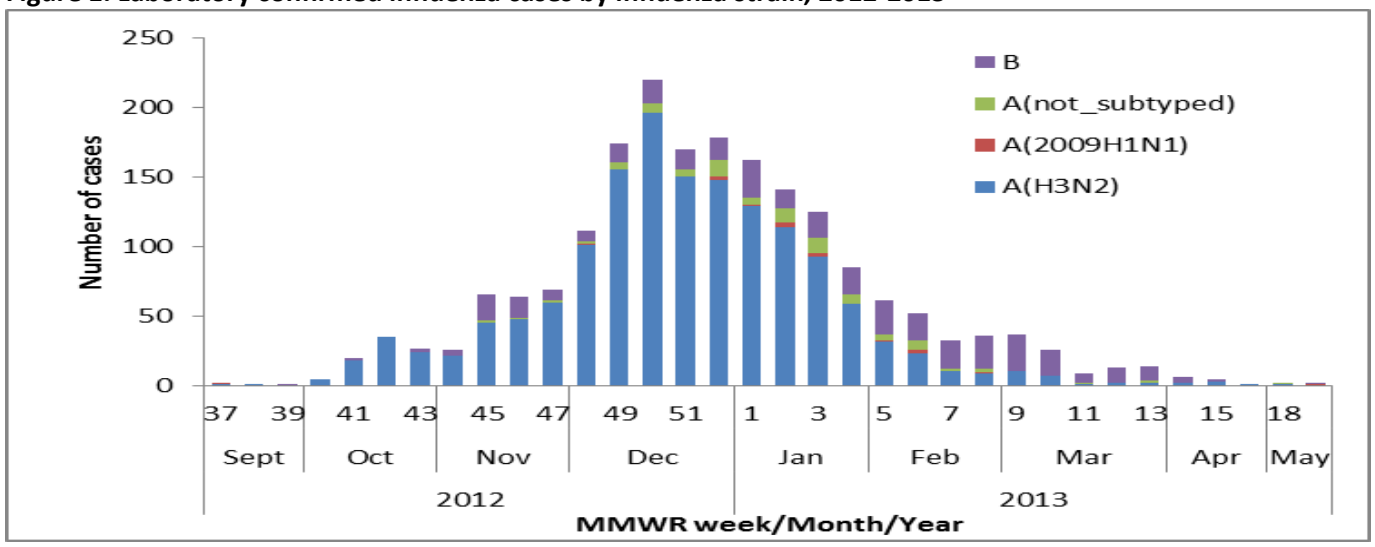
Laboratory surveillance program

The State Hygienic Laboratory (SHL) is the primary lab testing and reporting influenza tests in Iowa. SHL reports the number of tests performed and the type and strain of positive tests to the Influenza Surveillance Network on a daily basis. In addition, SHL surveys clinical and reference labs weekly for the number of rapid-antigen tests performed and the number of positive tests.

Influenza A (H3N2), influenza A (2009 H1N1) and influenza B were identified as circulating in Iowa during the 2012-2013 influenza season. The influenza activity had an early start, as the first lab-confirmed case occurred in September and cases increased through November and December before peeking in mid-December (Figure 1). Peak activity was similar, but a couple of weeks earlier (due to calls for more specimen submissions), than the timing of other surveillance indicators such as ILI outpatient visits and hospitalizations.

For question about this report, contact Yumei Sun at yumei.sun@idph.iowa.gov

Figure 1. Laboratory confirmed influenza cases by influenza strain, 2012-2013



Among the specimens testing positive for influenza during the season, influenza A (H3N2) viruses were predominant in Iowa, accounting for 76 percent of all positive influenza specimens tested, followed by influenza B (22 percent); influenza A (2009 H1N1) viruses accounted only less than one percent (Table 1).

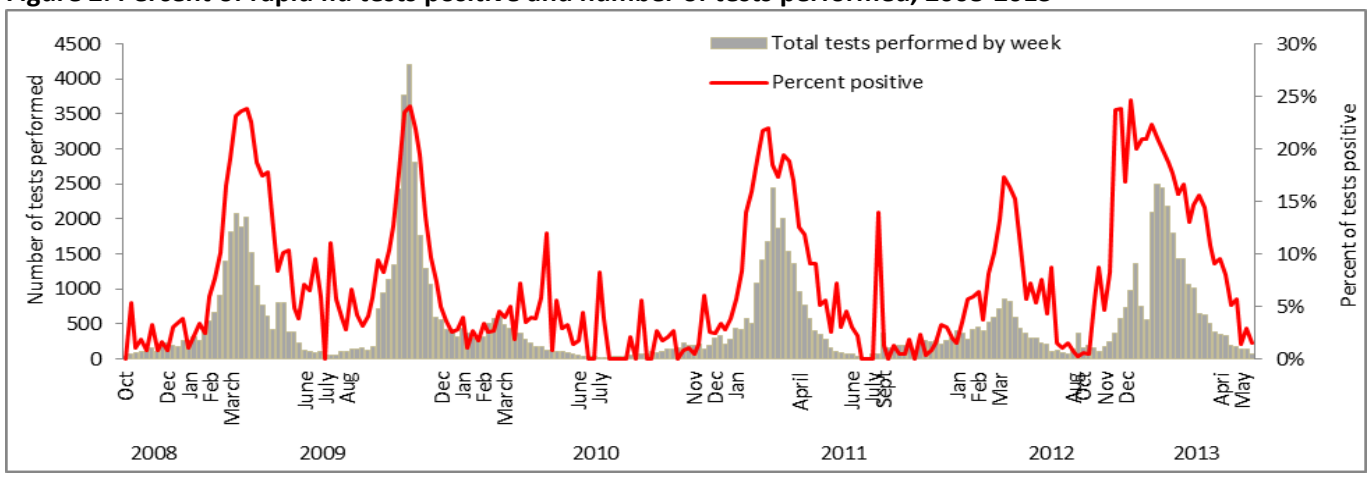
Table 1. Influenza viruses by age group, 2012-2013

Age group	*Flu A (2009 H1N1)*	*Flu A (H3N2)*	*Flu A (H3N2)Variant*	*Flu A (no typing)*	*Flu B*
0-4	5 (31%)	184 (12%)	* (*%)	7 (8%)	72 (20%)
5-17	3 (19%)	280 (19%)	* (*%)	5 (6%)	131 (36%)
18-24	0 (0%)	115 (8%)	0 (0%)	6 (7%)	32 (9%)
25-49	4 (25%)	269 (18%)	0 (0%)	7 (8%)	55 (15%)
50-64	2 (13%)	169 (11%)	0 (0%)	16 (19%)	27 (7%)
>64	2 (13%)	488 (32%)	0 (0%)	45 (52%)	51 (14%)
Total	16	1,509	1	86	368

* Counts of three or less of reportable diseases (novel flu A) are suppressed to protect confidentiality. Also note that counts may not add up to the total due to missing age information

SHL also recruits laboratories performing rapid (point-of-care) testing for influenza virus and respiratory syncytial virus (RSV) to participate in a weekly survey. Rapid test results are recorded using an online Survey Monkey tool that is sent via the Iowa Laboratory Response Network (ILRN). Labs were requested to report the total number of influenza rapid tests performed, and the number of positive test results. Figure 2 shows the percentage of rapid influenza tests that tested positive and the number of tests performed from 2008 to 2013. In 2012-2013, the percent of influenza rapid tests that tested positive began to increase in November before peaking at 24.6 percent during the week ending December 8, 2012 (MMWR Week 49) and remained high through January. The peak activity was similar, but one week earlier, than the timing of the peak of lab-confirmed cases. In general, the 2012-2013 season activity was higher when compared to the previous seasons.

Figure 2. Percent of rapid flu tests positive and number of tests performed, 2008-2013



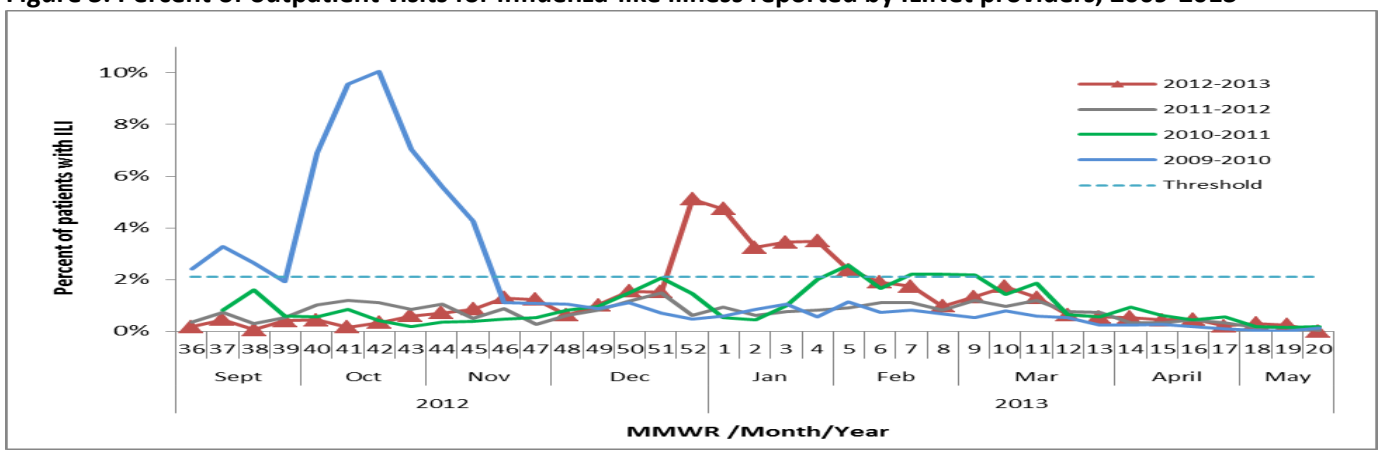
Outpatient health care provider surveillance program (ILINet)

Influenza-Like Illness (ILI) is defined as a fever of at least 100°F plus either a cough or a sore throat. There were 19 outpatient health care provider surveillance sites which participated in ILINet during the 2012-13 season. These sites report the number of patients seen with influenza-like illness and the total number of patient visits each week through the ILINet website maintained by CDC[1].

IDPH also participated in the Influenza Incidence Surveillance Project (IISP) funded by the Centers for Disease Control and Prevention and the Council of State and Territorial Epidemiologists. Six outpatient health provider sites in Iowa participated in this project and reported the number of ILI patients, acute respiratory illness (ARI) patients by age group (<1, 1-<2, 2-4, 5-17, 18-24, 25-49, 50-64, and >64) and the total number of patient visits each week. IISP providers also collected demographic and clinical information on the first ten ILI and ARI patients seen each week and submitted their specimens to SHL for confirmatory testing. The results were released daily to IDPH and the provider. In 2012-2013, there were 656 patients tested for influenza and other respiratory viruses by the State Hygienic Laboratory.

During the 2012-2013 influenza season, the weekly percentage of outpatient visits for ILI in Iowa was generally higher than the previous seasons (except the 2009 H1N1 pandemic). It peaked in the last week of December and remained high and well above the regional baseline level for six straight weeks from the week ending December 29, 2012 to the week ending February 2, 2013 (Figure 3). Nationally, the weekly ILI rate was also higher than the previous seasons (except the 2009 H1N1 pandemic).

Figure 3. Percent of outpatient visits for influenza-like illness reported by ILINet providers, 2009-2013



[1] http://www2a.cdc.gov/ilinet/

Influenza-associated hospitalizations

Since 2007, IDPH has collaborated with hospitals throughout Iowa to assess the impact of influenza. Hospitalization data provides invaluable insight into how severely an influenza strain is impacting a population. This type of surveillance is also key to detecting shifts in virulence, antiviral resistance, and vaccine efficacy.

Twenty-three sentinel hospitals in Iowa participated in the IISN this season. These hospitals tracked and reported the number of influenza-associated hospitalizations (diagnosed clinically or based on laboratory results) by age group (0-4, 5-24, 25-49, 50-64, and >64 years) and the total number of inpatients. Nearly 1,000 hospitalizations were reported from sentinel hospitals to IDPH from September 30, 2012 to May 18, 2013 (Figure 4), which was the highest number of hospitalizations reported from sentinel hospitals since reporting began in2006-2007 (Figure 5); of these hospitalizations, 52 percent were among people older than 64 years of age. The week ending December 29, 2012 (MMWR Week 52) marked the most cases of hospitalization and cases remained high through January, 2013. By comparison, there were only 119 hospitalizations reported during the mild 2011-2012 flu season.

Figure 4. Influenza-associated hospitalizations by age groups, 2012-2013

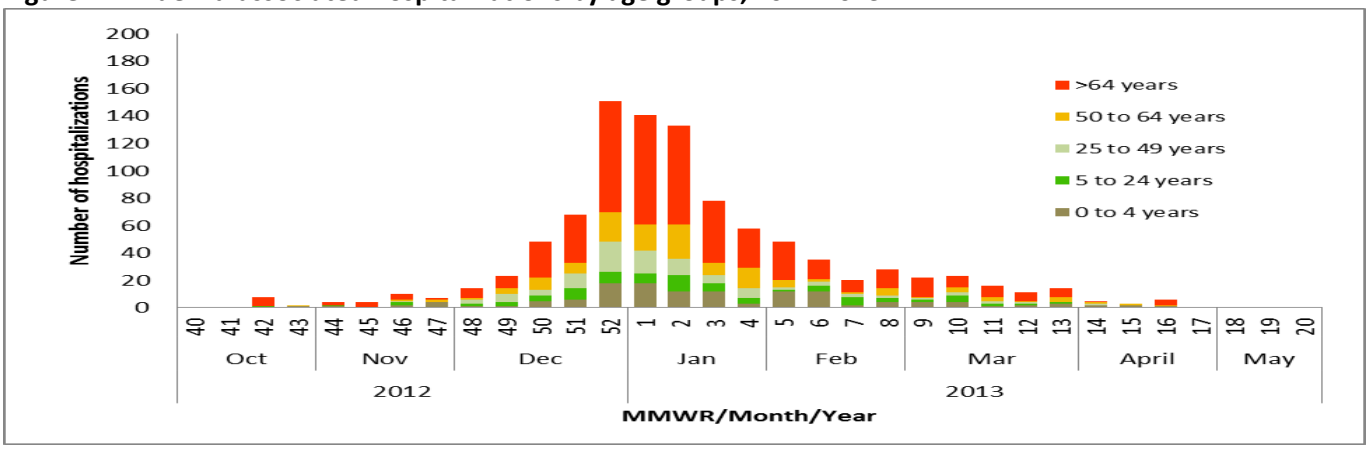
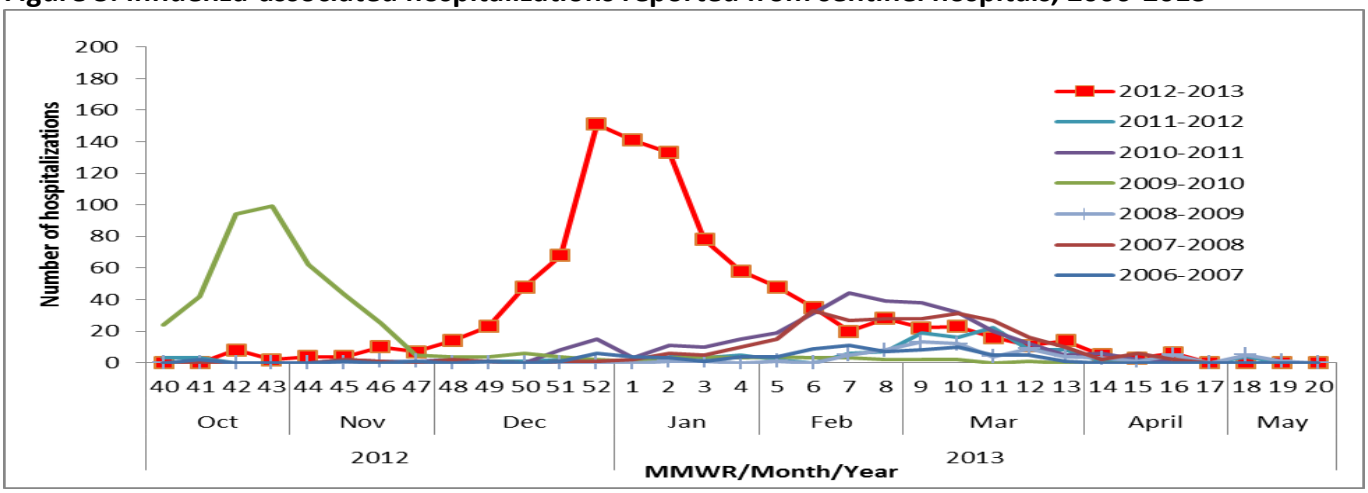


Figure 5. Influenza-associated hospitalizations reported from sentinel hospitals, 2006-2013



School surveillance program

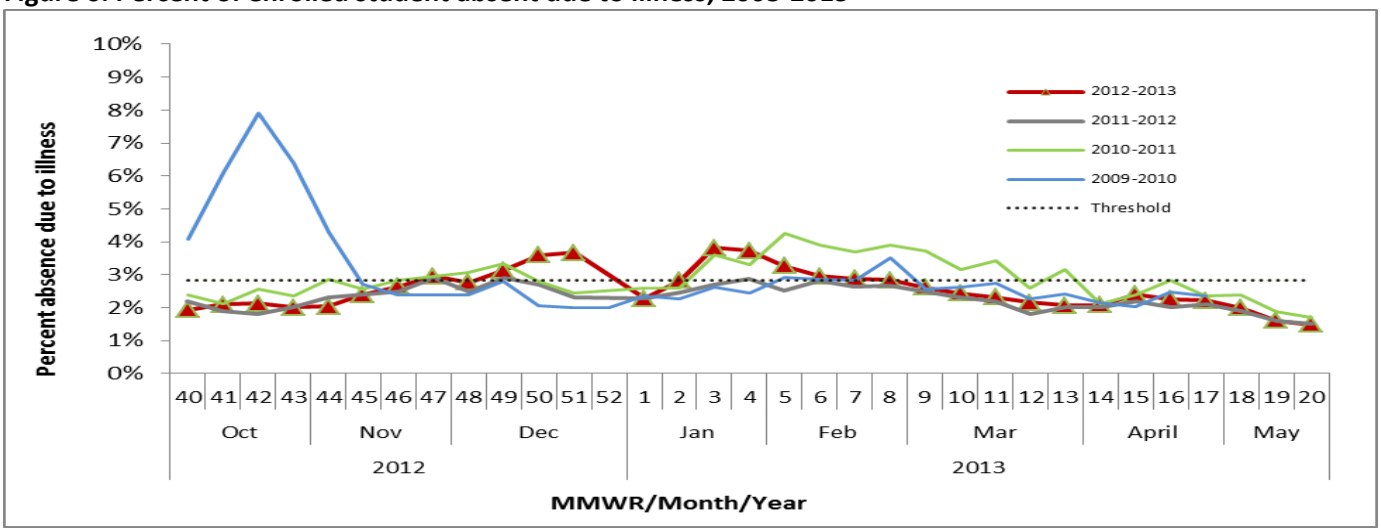
Iowa schools also participated in the IISN system for tracking and reporting absence due to all illness (including non-influenza illnesses). They also track total enrollment and log the number of days school was in session each week.

School data has historically been an excellent predictor of peak influenza activity; but not this season. This may due to the fact that influenza activity typically peaks in late January and February; this season it peaked in late December

when schools had a holiday break. Similar to the weekly percentage of outpatient visits for ILI, the weekly percentage of school absence due to illness was higher when compared to the previous seasons and exceeded the baseline in early December through early February, except week 52 and week 1 when schools were out for the holiday break (Figure 6).

The Iowa Department of Public Health also tracks the number of schools reporting ≥10% student absence. In 2012-2013, more than 150 school outbreaks (≥10% absenteeism) were reported to IDPH, which was higher than 32 reported in the previous season.

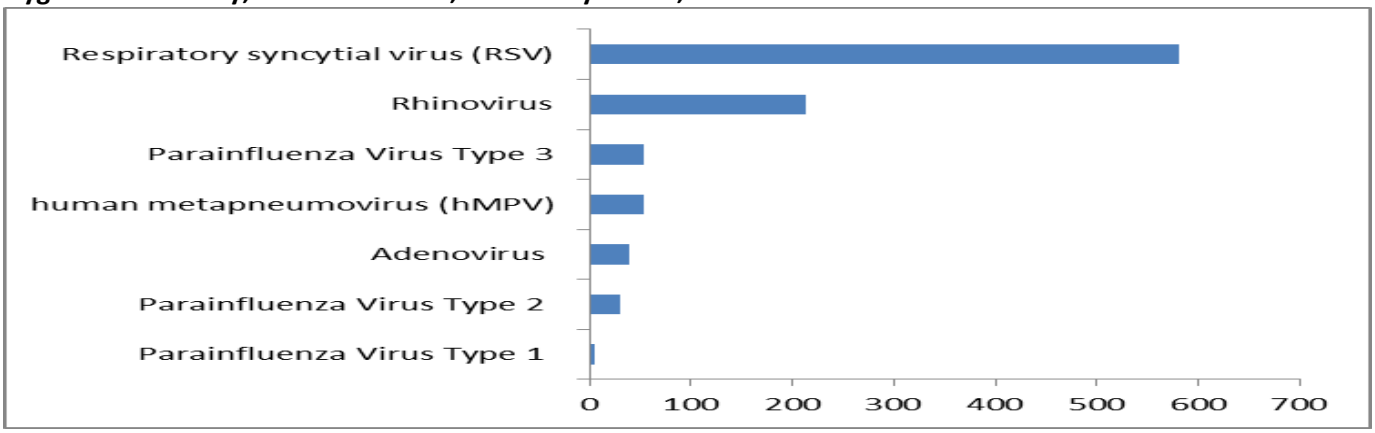
Figure 6. Percent of enrolled student absent due to illness, 2008-2013



Non-influenza viral respiratory pathogens

The State Hygienic Laboratory, the Mercy Dunes Medical Laboratory - Sioux City, and Iowa Methodist Medical Center in Des Moines submit non-influenza virus culture results to IDPH on a weekly basis. The labs screen for adenovirus, parainfluenza 1-4, respiratory syncytial virus (RSV), Human Metapneumovirus (hMPV), and rhinovirus/ enteroviruses. In addition, SHL also tests specimens from IISP patients using the real-time RT-PCR panel developed at the CDC for RSV, Adenovirus, Parainfluenza viruses 1-3, hMPV, and Rhinovirus. Culture and real time RT-PCR results are summarized in Figure 7.

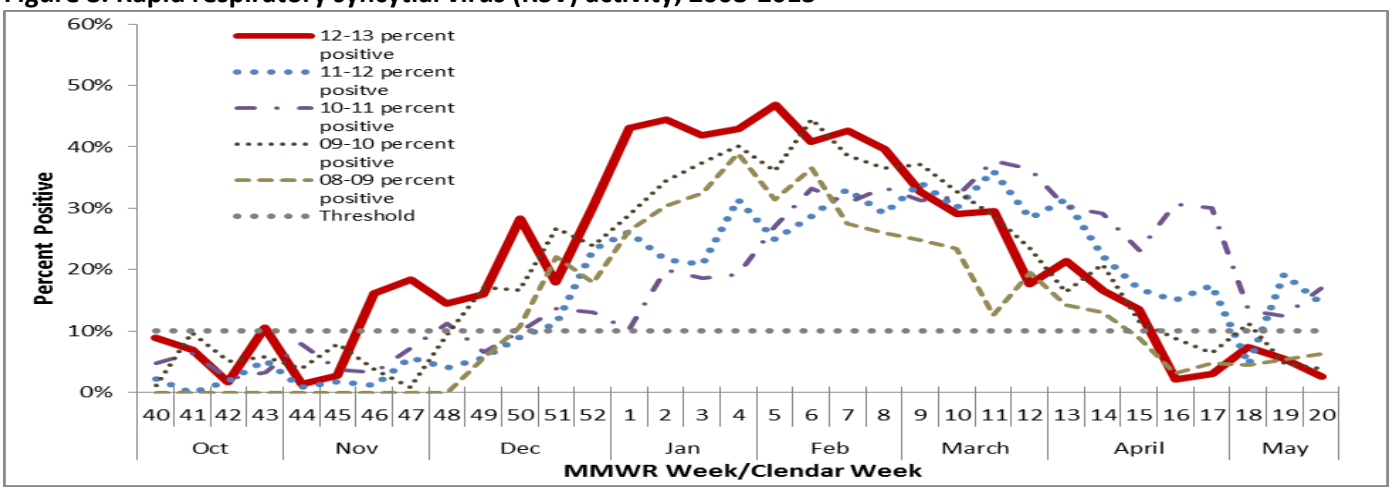
Figure 7. Number of positive culture and RT-PCR results for non-influenza respiratory virus isolated by the State Hygienic laboratory, Iowa Methodist, and Mercy Dunes, 2012-2013



Surveillance for respiratory syncytial virus(RSV) began in 2008. IDPH and SHL solicit rapid RSV test results from clinical and reference labs throughout the state to determine the percentage of positive test results of those

performed. The CDC considers RSV widespread in the population when the percent of rapid antigen tests that are positive exceeds 10 percent. This typically occurred in mid-December, however, this season it occurred in mid-November which was earlier than previous seasons and activity was higher than previous seasons (Figure 8).

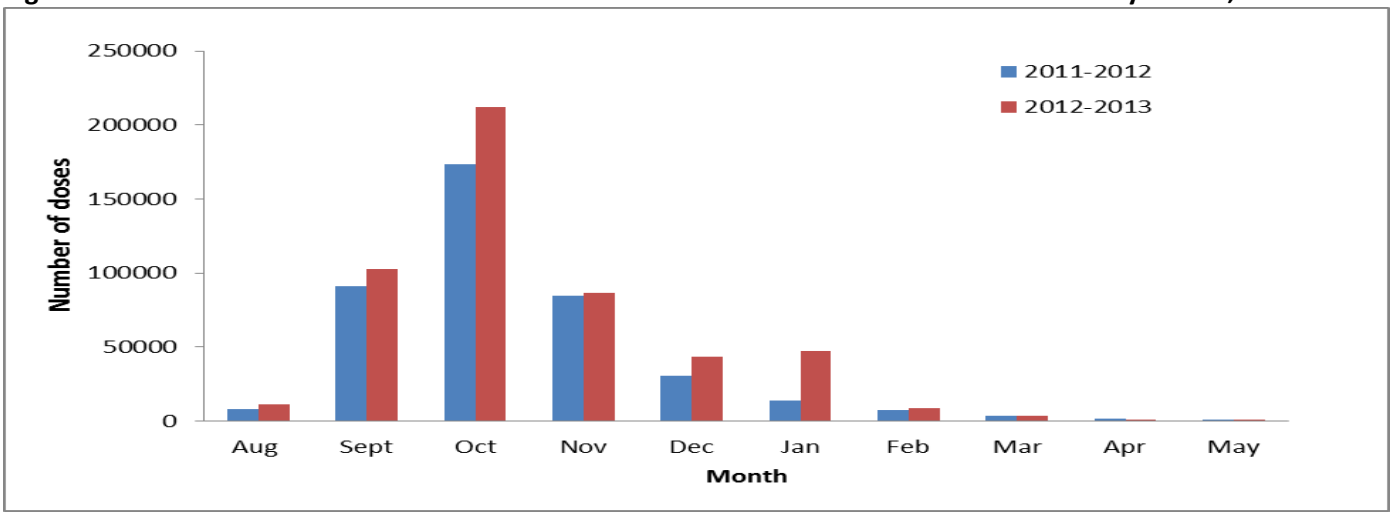
Figure 8. Rapid respiratory syncytial virus (RSV) activity, 2008-2013



Seasonal influenza vaccination in Iowa

Seasonal influenza vaccination in Iowa was based on doses reported to the Iowa Immunization Registry Information System[2] (IRIS). IRIS is a confidential, computerized, population-based system that tracks immunizations for children, adolescents and adults who are seen in a variety of public and private healthcare provider sites throughout the state. The number of seasonal influenza vaccine doses reported to IRIS during the 2012-13 season was higher than the previous season and over 95 percent of these vaccine doses were administered in September through January, with the highest number administered in October (Figure 9).

Figure 9. Number of doses of seasonal influenza vaccine administered and recorded in IRIS by month, 2011-2013



[2] For information on the immunization data, contact Kim Tichy, IRIS coordinator, at 515-281-4288 or Kimberly.Tichy@idph.iowa.gov