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
2011-2012 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 2011-2012 influenza season, approximately 250 surveillance sites reported data to IDPH.

The 2011-2012 influenza season had a mild level of activity compared to most non-pandemic influenza seasons in Iowa. The first case of seasonal influenza was confirmed by the State Hygienic Laboratory (SHL) in November, 2011 and influenza activity remained low through December, increasing in January and February before peaking in mid-March (Figure 1). Iowa reported "widespread" statewide influenza activity, the highest level of reporting to the CDC, for only two straight weeks - the week ending March 10 and the week ending March 17, 2012 (MMWR Weeks 10-11). SHL identified three seasonal influenza viruses circulating in Iowa: influenza A (H3), influenza A (2009 H1N1) and influenza B. Influenza A (H3) viruses were predominant in Iowa, accounting for 85 percent of all positive influenza specimens tested.

National influenza activity

According to the CDC, 2011-2012 was one of the mildest and latest seasons on record. Influenza activity occurred at low levels during October through December, and increased in January and February before peaking in mid-March. The geographic distribution of influenza activity was most extensive during the week ending March 17, 2012 (Week 11), when 20 states reported widespread influenza activity and 20 states reported regional influenza activity. The number of states reporting widespread or regional activity during the peak week of activity has ranged from 49 to 50 states during the previous three influenza seasons.

Influenza A (H3N2) viruses predominated overall, but influenza A (2009 H1N1) and influenza B viruses also circulated widely. The majority of all influenza viruses in specimens sent to CDC for further antigenic characterization was similar to the components of the 2011-2012 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 (Tamiflu[R]) among 2009 H1N1 viruses. All viruses tested retained sensitivity to zanamivir.

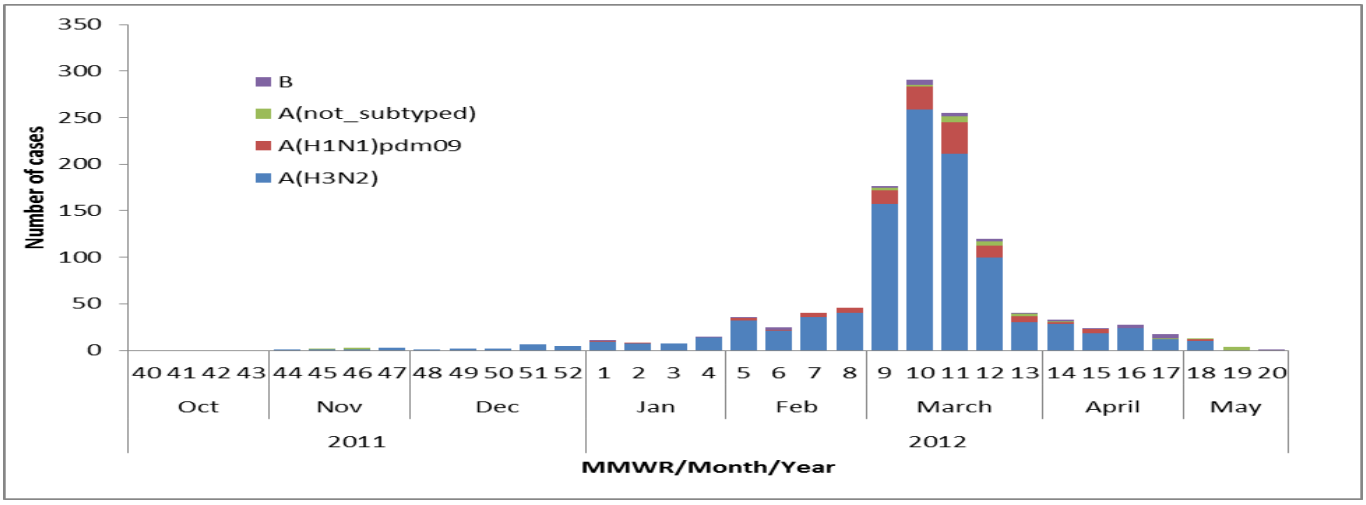
Laboratory surveillance program

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 for the number of rapid-antigen tests performed and number positive weekly.

Influenza A (H3N2), influenza A (2009 H1N1) and influenza B were identified circulating in Iowa during the 2011-2012 influenza season. The influenza activity had a late start, as the first lab-confirmed case occurred in November and cases peeked in mid-March. Peak activity in Iowa was similar, but one week earlier, to the timing of peak activity in the nation (Figure 1).

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

Figure 1. Laboratory confirmed influenza cases by influenza strain, 2011-2012



Among the specimens testing positive for influenza during the season, influenza A (H3) viruses were predominant in Iowa, accounting for 85 percent of all positive influenza specimens tested and nearly half of the A(H3) cases occurring in people younger than 18 years of age (Table 1).

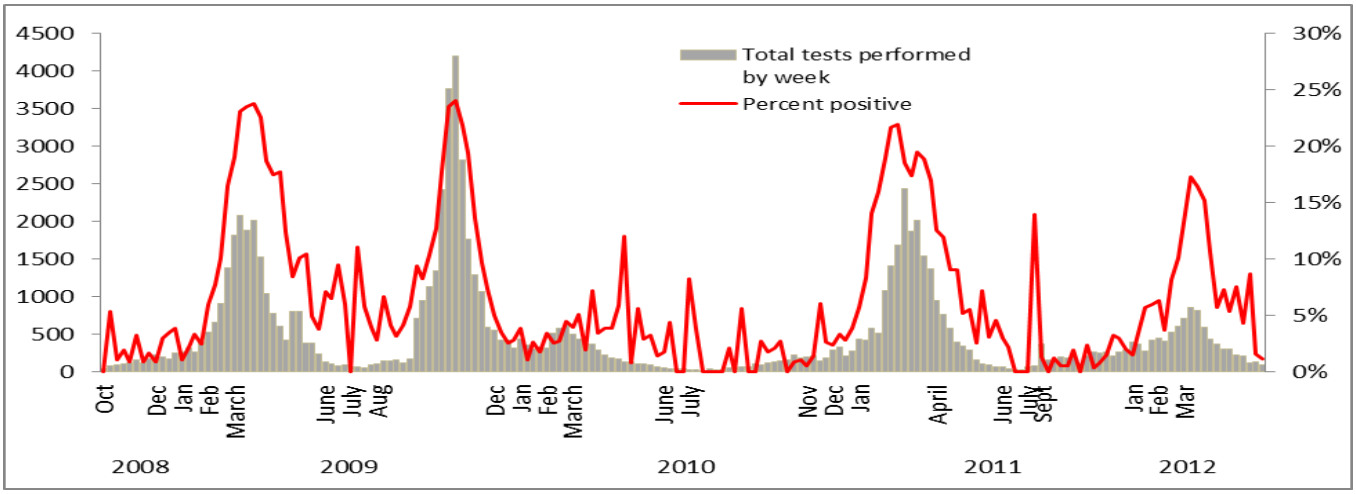
Table 1. Influenza viruses by age group, 2011-2012

Age group	*Flu A (2009 H1N1)*	*Flu A (H3)*	*Novel A (H3N2)*	*Flu A (no subtyping)*	*Flu B*
0-4	16 (14%)	231 (22%)	* (*%)	5 (20%)	7 (22%)
5-17	23 (20%)	259 (25%)	* (*%)	2 (8%)	10 (31%)
18-24	24 (20%)	75 (7%)	0 (0%)	2 (8%)	3 (9%)
25-49	49 (42%)	216 (21%)	0 (0%)	10 (40%)	5 (16%)
50-64	4 (3%)	97 (9%)	0 (0%)	2 (8%)	4 (13%)
>64	1 (1%)	158 (15%)	0 (0%)	4 (16%)	3 (9%)
Total	117	1038	3	25	32

* 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 surveymonkey 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 2012. In 2011-2012, the percent of influenza rapid tests that tested positive began to increase in January, and peaked at 17 percent during the week ending March 10, 2012 (MMWR Week 10). The peak activity was similar to the timing of the peak of lab-confirmed cases. In general, the 2011-2012 season activity was lower when compared to the previous seasons.

Figure 2. Percent of rapid flu tests positive and number of tests performed, 2008-2012



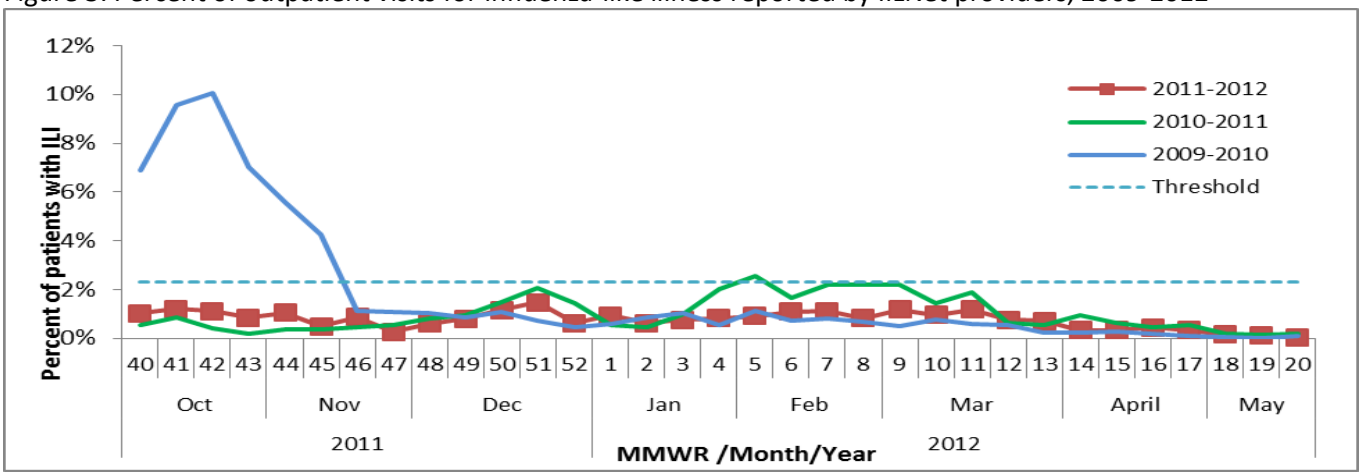
Outpatient health care provider surveillance program (ILINet)

Influenza-Like Illness (ILI) is defined as a fever of at least 100°F plus either a cough or a sore throat. There are approximately 10 to 15 outpatient health care provider surveillance sites surveying patient populations for ILI each week. 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 10 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 2011-2012 season, there were 524 patients tested for influenza and other respiratory viruses at the State Hygienic Laboratory.

During the 2011-2012 influenza season, the weekly percentage of outpatient visits for ILI in Iowa was generally lower than the previous seasons and did not exceed the regional baseline level for the entire season. Nationally, the weekly ILI rate was also lower than the previous seasons and the peak ILI rate was the lowest reported since 1997.

Figure 3. Percent of outpatient visits for influenza-like illness reported by IILNet providers, 2009-2012



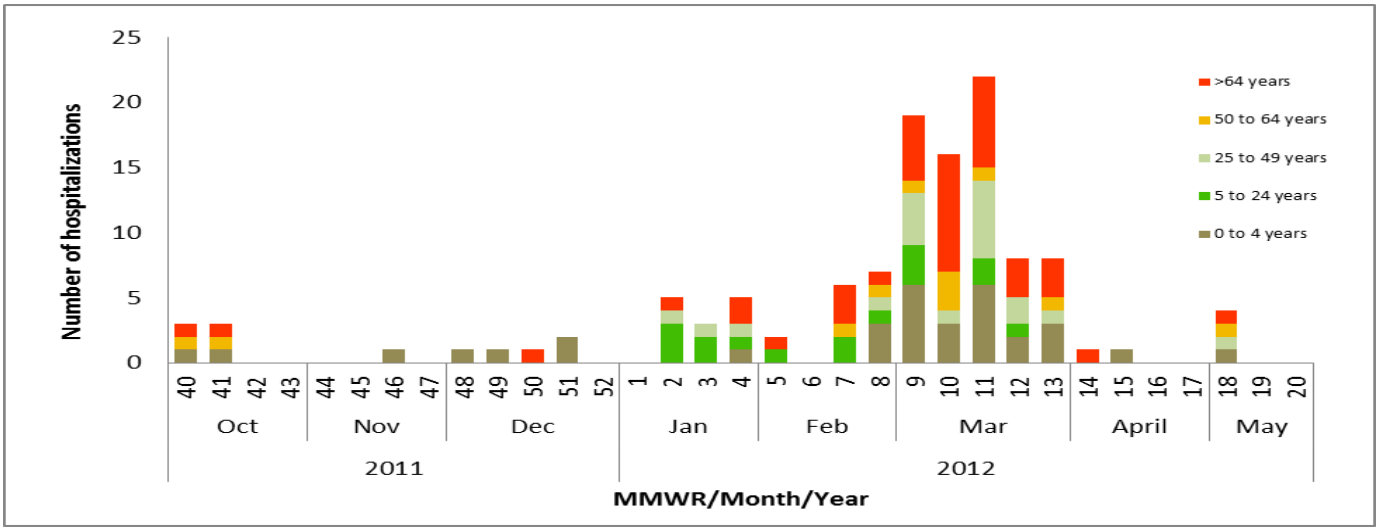
[1] http://www2a.cdc.gov/ilinet/

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-six 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. A total of 119 hospitalizations were reported from sentinel hospitals to IDPH from October 10, 2011 to May 19, 2012, which was half of the number reported in the 2010-2011 season. The week ending March 17, 2012 (MMWR Week 11) marked the most cases of hospitalization. The age group impacted was similar to the previous season with highest numbers occurring in people younger than 5 years of age and older than 64 years of age.

Figure 4. Influenza-associated hospitalizations by age groups, 2011-2012



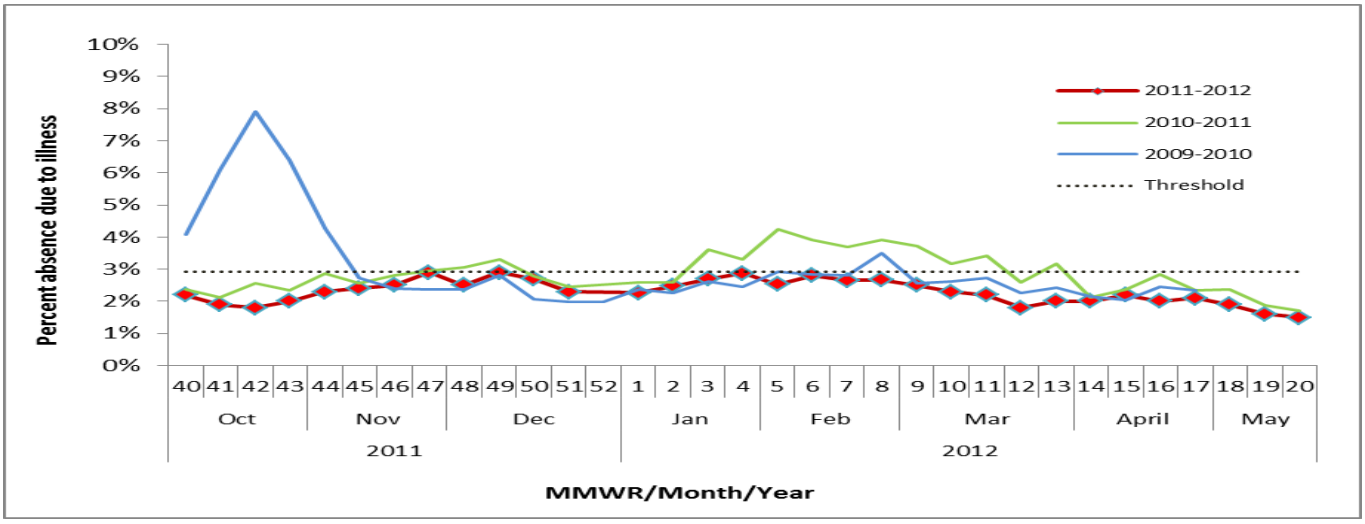
School surveillance program

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 mid-March when most schools had a spring break. Similar to the weekly percentage of outpatient visits for ILI, the weekly percentage of school absence due to illness was lower when compared to the previous seasons and did not exceed the baseline, but met the baseline level for several times in the season (Week 47, Week 49, Week 4 and Week 6).

The Iowa Department of Public Health also tracks the number of schools reporting ≥10% student absence. In the 2011-2012 influenza season, there were about 40 reports of ≥10% absenteeism reported to IDPH (including multiple reports per week and per school). The number of schools reporting ≥10% student absence was also lower than previous seasons.

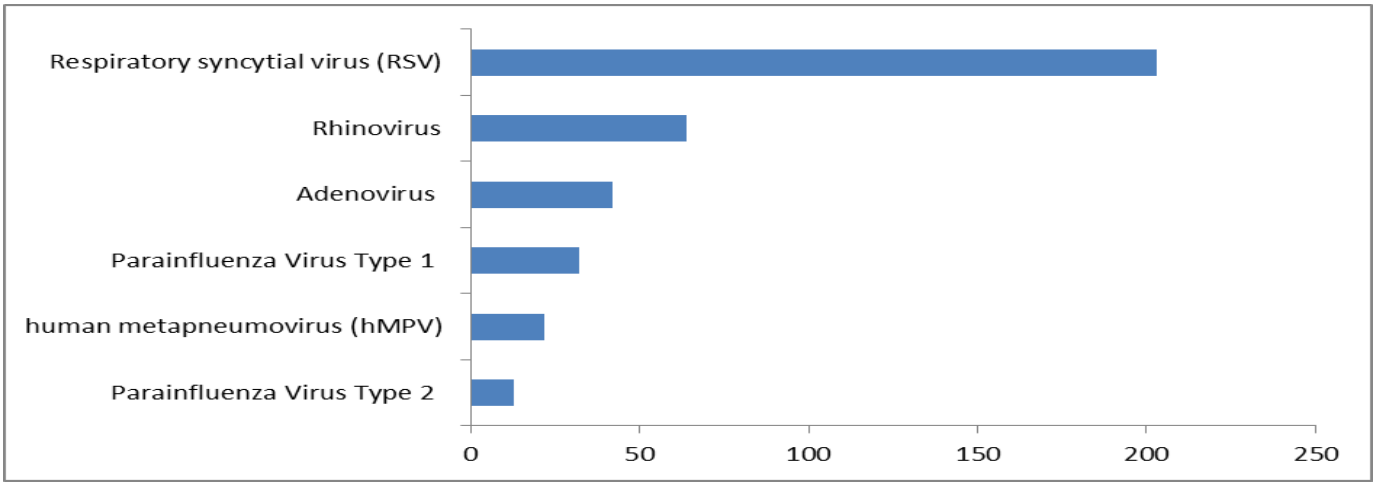
Figure 5. Percent of enrolled student absent due to illness, 2008-2012



Non-influenza viral respiratory pathogens

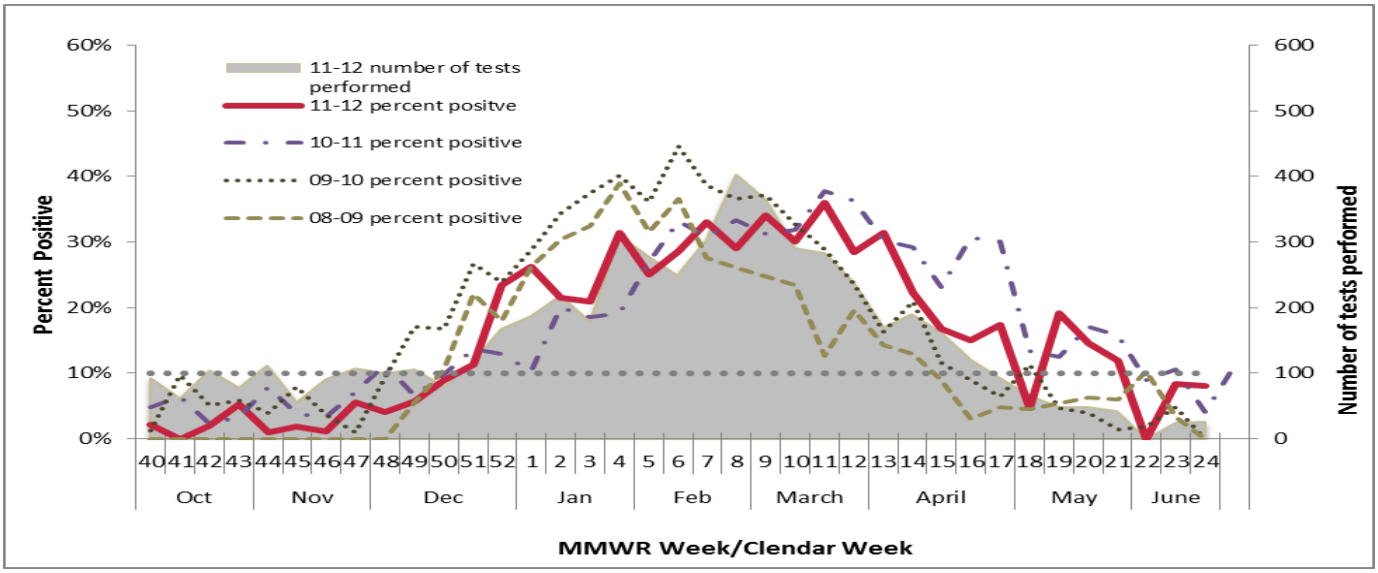
The State Hygienic Laboratory, the Mercy Dunes Medical Laboratory - Sioux City, and Iowa Methodist Medical Center in Des Moines submit non-influenza virus culture results to IDPH on a weekly basis. The labs screen for adenovirus, parainfluenza 1-3, respiratory syncytial virus (RSV), enteroviruses, and rhinovirus. In addition, SHL also tested specimens from IISP patients using the real-time RT-PCR panel developed at the CDC for RSV, Adenovirus, Parainfluenza viruses 1-3, Human Metapneumovirus (hMPV), and Rhinovirus. Culture and real time RT-PCR results were summarized in Figure 6.

Figure 6. Number of positive culture and RT-PCR results for non-influenza respiratory virus isolated by the State Hygienic laboratory and Mercy Dunes in Sioux City, 2010-2011



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. During the 2011-2012 season in Iowa, this occurred in mid-December.

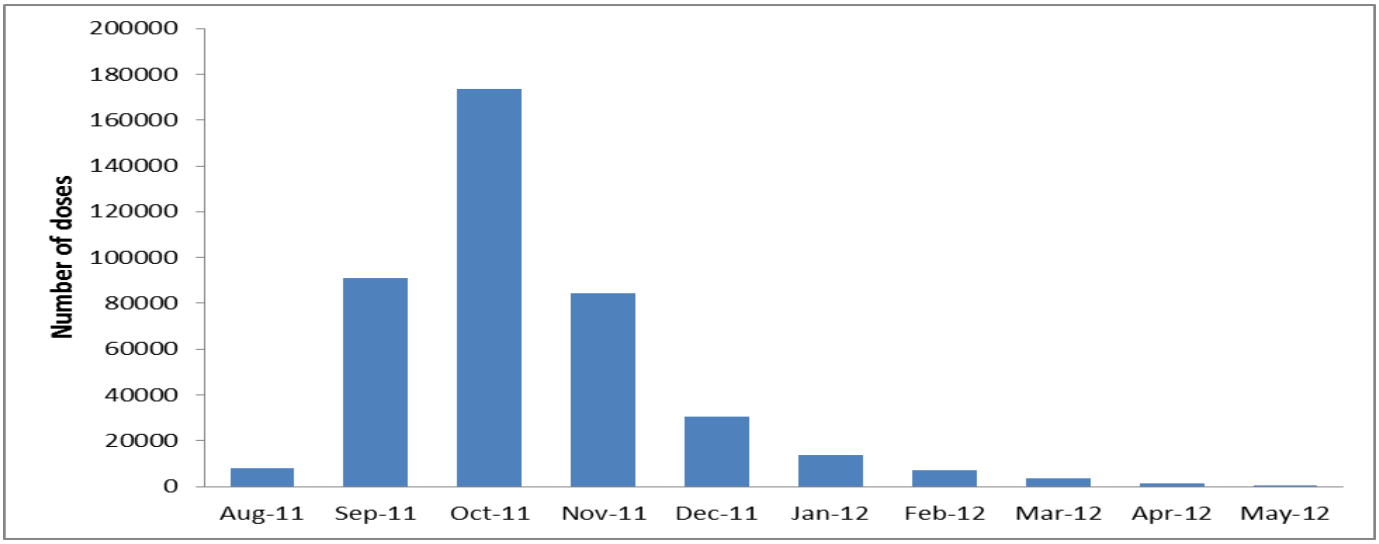
Figure 7. Rapid respiratory syncytial virus (RSV) activity, 2008-2012



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 health-care provider sites throughout the state. Figure 8 shows the large majority (84 percent) of the seasonal influenza vaccine for the 2011-2012 season was administered in September through November, with the highest number administered in October.

Figure 8. Number of doses of seasonal influenza vaccine administered and recorded in IRIS by month, 2011-2012



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