Iowa Influenza Surveillance Network (IISN)

Influenza-like Illness (ILI) and Other Respiratory Viruses
2010-2011 Season Summary Report

Summary

The Iowa Influenza Network Surveillance (IISN) has been 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 2010-2011 influenza season, approximately 200 surveillance sites reported data to the Iowa Department of Public Health.

After the 2009-2010 H1N1 influenza pandemic, influenza virus circulation in the 2010-2011 season returned to a more typical season distribution (as seen prior to the 2009 pandemic) with three strains of influenza viruses identified in Iowa - influenza A (H3N2), 2009 influenza A (H1N1) and influenza B. The influenza season occurred from October through May, peaking in late January and early February. Iowa reported "widespread" statewide influenza activity, the highest level of reporting to the CDC, for six straight weeks from the week ending February 12 through the week ending March 19, 2011 (MMWR Weeks 6-11).

National influenza activity

According to the CDC, influenza activity in the United States peaked nationally in early February during the 2010-2011 season. During the week ending January 29, 2011, 30 states reported widespread influenza activity and 15 states reported regional influenza activity; by the week ending February 19, 44 states reported widespread influenza activity.

While influenza A(H3N2) viruses were most commonly identified nationally, 2009 influenza A(H1N1) and influenza B viruses also circulated throughout the season. The viruses tested were similar to the viruses chosen for the 2010-2011 flu vaccine. Influenza antiviral resistance patterns were similar to the previous season with widespread resistance to the adamantine class of drugs (amantadine and rimantadine) among influenza A viruses, and rare sporadic cases of resistance to oseltamivir (Tamiflu^{R}) among both influenza A (H3N2) and 2009 influenza A (H1N1) viruses. All viruses tested retained sensitivity to zanamivir.

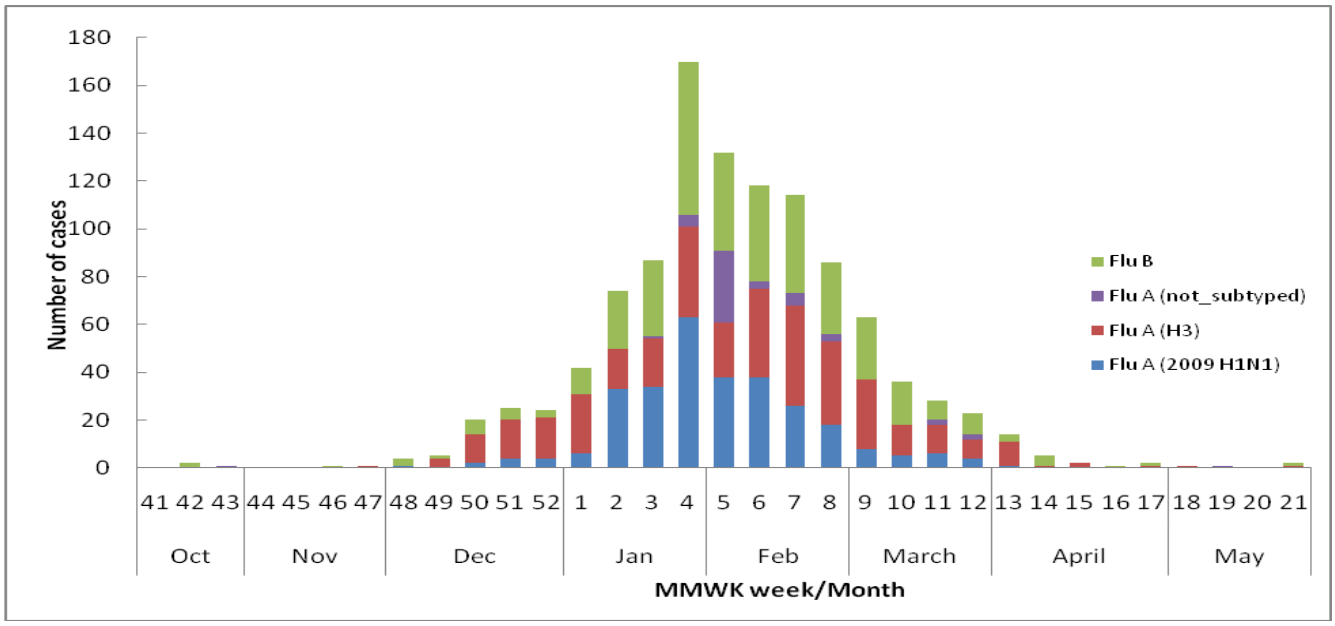
Laboratory surveillance program

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 several times every week. In addition, SHL surveys clinical and reference labs for the number of rapid-antigen tests performed and number positive weekly.

Influenza A (H3N2), 2009 influenza A (H1N1) and influenza B were identified circulating in Iowa during the 2010-2011 influenza season. The season occurred from October through May, peaking in late January and early February. Peak activity in Iowa was similar 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, 2010-2011



Among the specimens testing positive for influenza during the season, influenza B accounted for 35 percent, influenza A (H3N2), 34 percent, and influenza A (H1N1) 27 percent. 2009 influenza A (H1N1) disease was highest in the 18-24 year age group and influenza B was highest in children aged 5-17 years. While influenza A (H3N2) occurred most in people 65 and older, high numbers of cases were also seen in children younger than 18 years of age (Table 1).

Table 1. Influenza viruses by age group

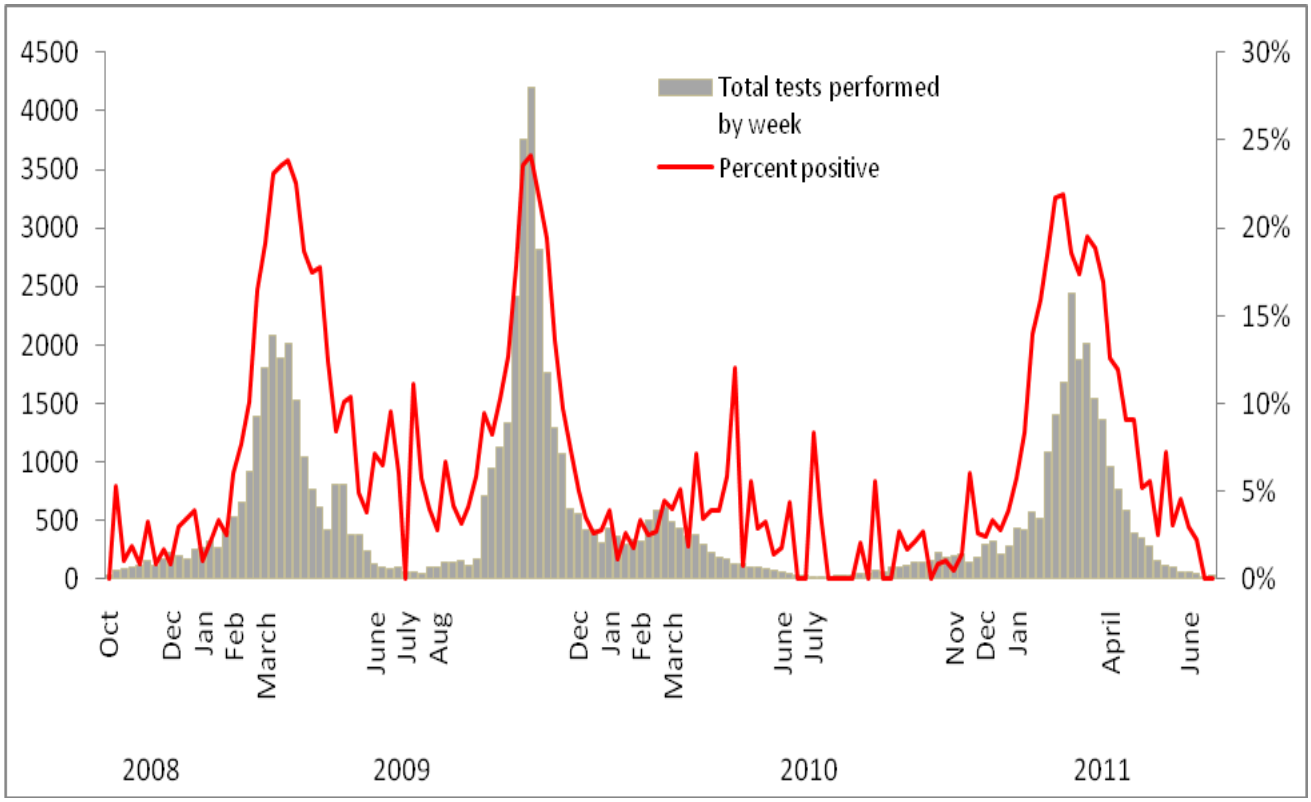
Age group	*Flu A (2009 H1N1)*	*Flu A (H3)*	*Flu A (no subtyping)*	*Flu B*
0-4	41 (14%)	58 (16%)	7 (13%)	67 (18%)
5-17	55 (19%)	60 (16%)	8 (15%)	165 (44%)
18-24	90 (31%)	23 (6%)	5 (10%)	60 (16%)
25-49	71 (25%)	68 (18%)	12 (23%)	47 (12%)
50-64	29 (10%)	34 (9%)	6 (12%)	13 (4%)
>64	5 (2%)	126 (34%)	14 (27%)	23 (6%)
Total	291	369	52	375

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. Labs must report test results for a minimum of 12 of 29 weeks (40 percent) to be included in the

surveillance program. Of the 168 labs asked to participate, 81 labs reported influenza rapid test results at least 40 percent of the time.

Figure 2 shows the percentage of rapid influenza tests that tested positive and the number of tests performed from 2008 to 2011. In 2010-2011, the percent of influenza rapid tests that tested positive began to increase in January, and peaked at 22 percent during the week ending February 12, 2011 (MMWR Week 5). The 2010-2011 season was similar to the 2008-2009 season with activities high in February and March. During the pandemic 2009-2010 influenza season, the percent of influenza rapid tests that tested positive peaked in October.

Figure 2. Percent of rapid flu tests positive and number of tests performed, 2008-2011



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 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. Five 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 clinic

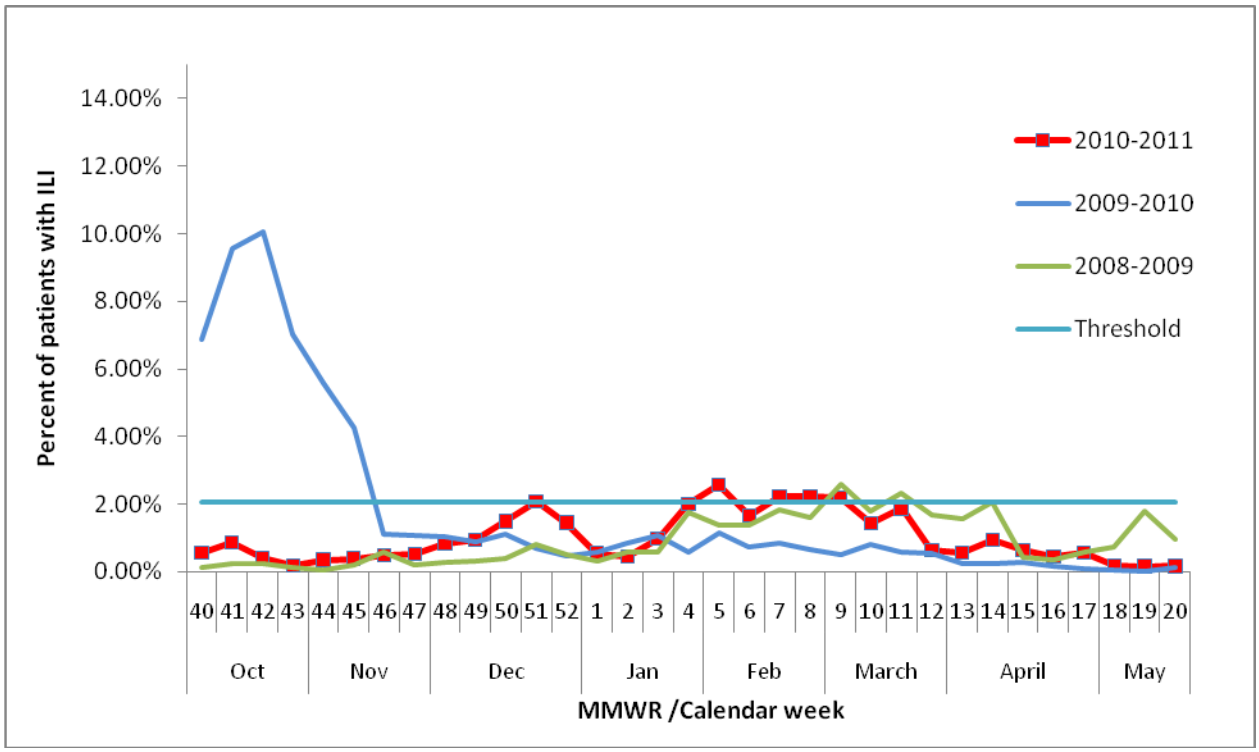
[1] http://www2a.cdc.gov/ilinet/

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 2010-2011 season, there were 1046 patients tested for influenza and other respiratory viruses at the State Hygienic Laboratory.

During the 2010-2011 influenza season, rates of ILI began to increase in late December; however, the rates decreased in early January (a holiday season and reporting may not be robust) and then increased again in late January, peaking at 2.6 percent during the week ending February 5, 2011 (MMWR Week 5).

In general, the 2010-2011 season was similar to the 2008-2009 season; however, the 2010-2011 ILI activity peaked in early February while 2008-2009 activity peaked in early March. During the pandemic 2009-2010 influenza season, ILI activity peaked in late October and well above the baseline.

Figure 3. Percent of outpatient visits for influenza-like illness reported by IILNet providers, 2008-2011



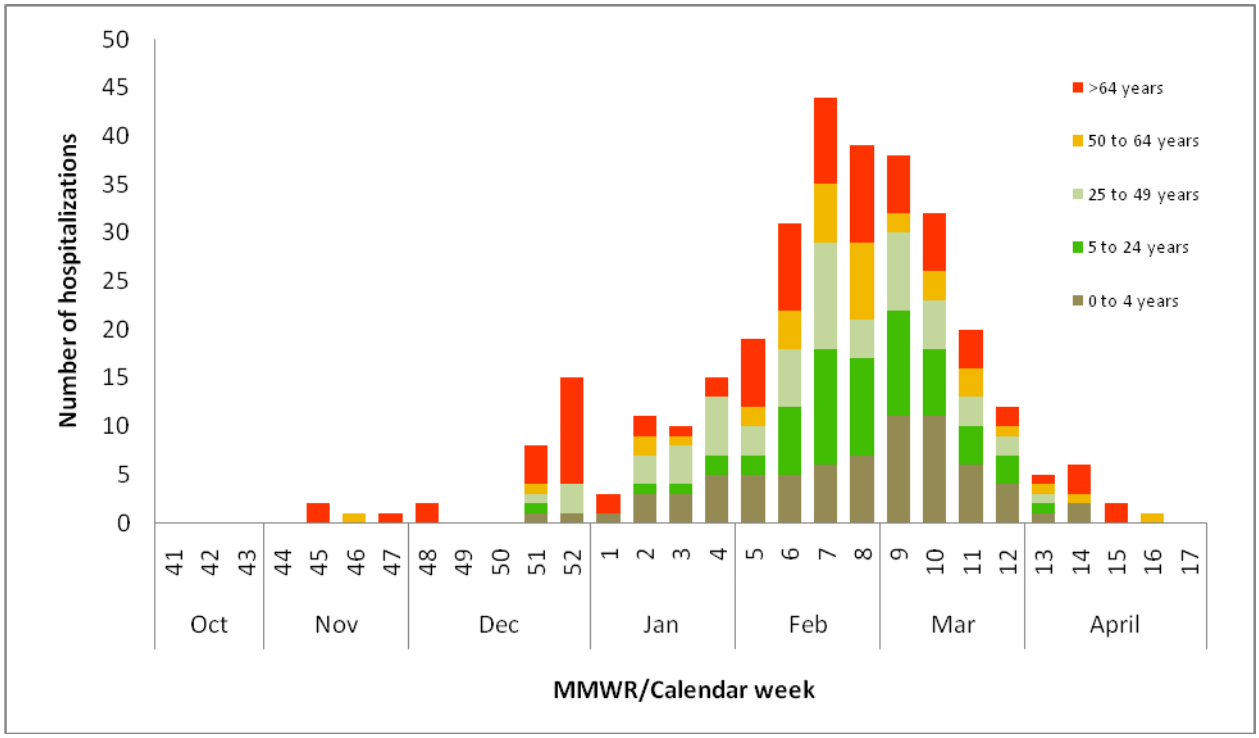
Influenza-associated hospitalizations

Since 2007, the 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-one Iowa hospitals participate in the IISN for this season. These hospitals track and report 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 317 hospitalizations were reported from sentinel hospitals to IDPH from October 10, 2010 to April 30, 2011. The week ending February 19, 2011 (MMWR Week 7) marked the most cases of hospitalization. In the

2010-2011 influenza season, 42 percent of influenza-associated hospitalizations occurred in people younger than 25 years of age and 27 percent in people older than 64 years of age.

Figure 4. Influenza-associated hospitalizations by age groups, 2010-2011



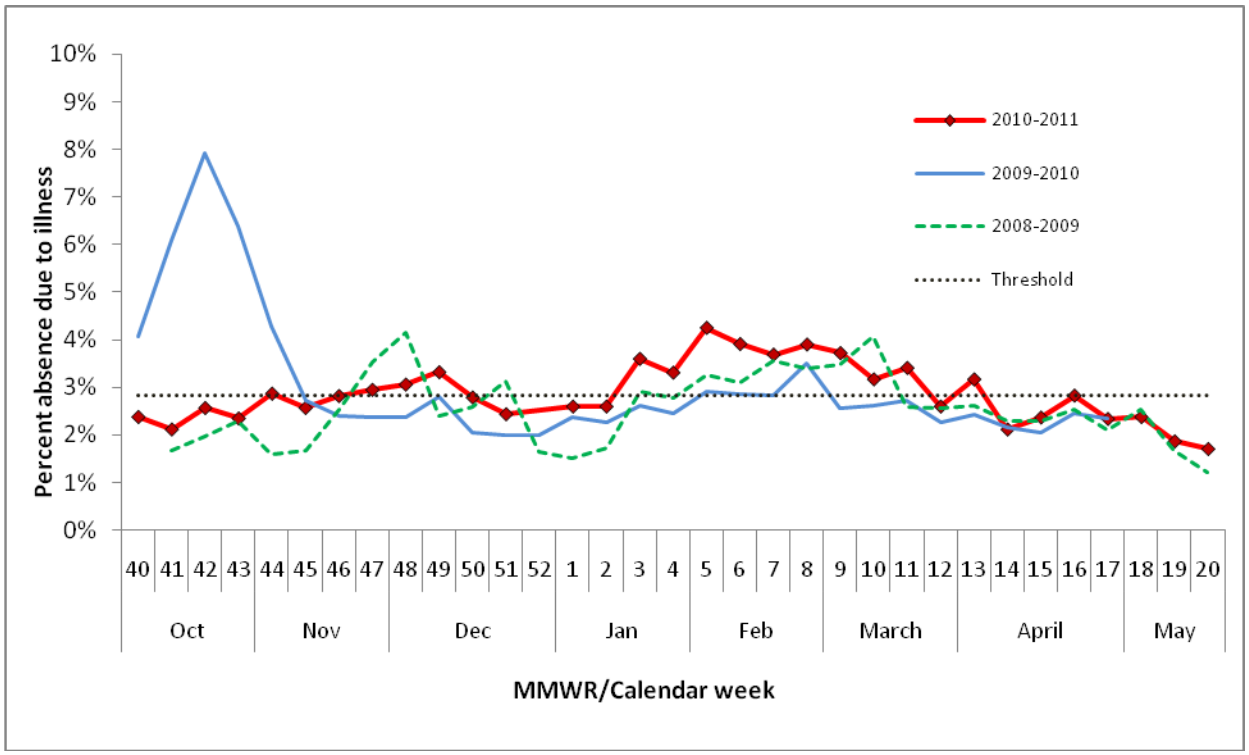
School surveillance program

Forty-two Iowa schools participate 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 and this season was no exception. Activity breached the threshold late January and early in February, which was the same time ILINet providers saw an increase in patients with ILI. Again, the 2010-2011 and 2008-2009 seasons were similar, with the high activities in late January and February. During the pandemic 2009-2010 influenza season, the percent of school students absent due to illness peaked in late October and well above the baseline (Figure 5).

The Iowa Department of Public Health also tracks the number of schools reporting ≥10% student absence. In the 2010-2011 influenza season, there were approximately 290 reports of ≥10% absenteeism reported to IDPH (including multiple reports per week and per school). The number of schools reporting ≥10% student absence peaked with 37 during the week ending February 19 (MMWR week 7).

Figure 5. Percent of enrolled student absent due to illness, 2008-2011

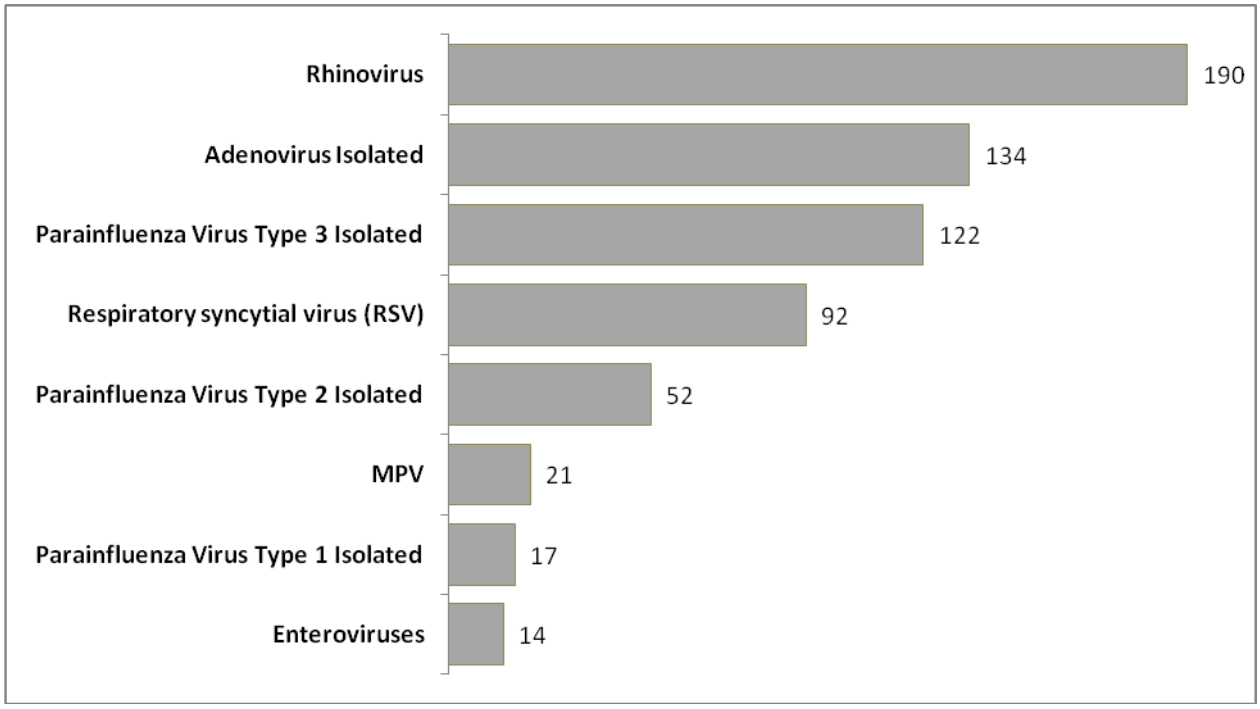


Non-influenza viral respiratory pathogens

The State Hygienic Laboratory and the Mercy Dunes Medical Laboratory - Sioux City 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.

Rhinovirus cases were largely detected by real-time RT-PCR, with most cases identified between September and November. Most adenovirus cases were identified between October and May, similar to the timing of seasonal influenza. Parainfluenza 2 viruses peaked in late September and Parainfluenza 3 viruses were detected primarily in January through May. Low numbers of Parainfluenza 1 was detected in December through March. Most RSV cases were detected between February and April. All hMPV cases were detected by PT-PCR with most cases identified in late February and March.

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. In Iowa, this occurred in January during the 2010-2011 season, which was later than previous seasons. The percent of RSV rapid tests postive in the 2010-2011 season was also lower than in previous seasons.

Figure 7. Rapid respiratory syncytial virus (RSV) activity, 2008-2011