



# Iowa Influenza Surveillance Network (IISN) Influenza-like Illness (ILI) and Other Respiratory Viruses 2017-2018 Season Summary Report October 1, 2017 – May 19, 2018



All data presented in this report are provisional and may change as additional reports are received

## Summary of Iowa activity

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.

The 2017-2018 influenza season (October 1, 2017-May 19, 2018) in Iowa, similar to national activity, had higher levels of outpatient influenza-like illness (ILI), influenza-related hospitalizations, and influenza-associated deaths than in recent seasons. Influenza activity peaked on most measures in January 2018. Influenza A(H3N2) viruses were the most commonly identified through MMWR week 7 in February 2018 and were the predominant virus reported for the season for the second season in a row. Influenza B viruses, of which over 99 percent were identified as Yamagata lineage, began to increase in December 2017 and outnumbered influenza A viruses reported in February through May 2018. Iowa reported “widespread” statewide influenza activity to the CDC, which is the highest level of activity, for 10 consecutive weeks beginning with MMWR week 52 in December 2017 through week 9 at the end of February 2018.

Highlights of the Iowa 2017-2018 influenza season summary report for the period October 1, 2017 through May 19, 2018 include the following:

- 1,510 influenza positive specimens out of 2,426 specimens tested (62% positive) were confirmed by the State Hygienic Laboratory at the University of Iowa (SHL), with 962 (64%) specimens confirmed as influenza A (H3N2) and 477 (32%) specimens identified as influenza B (Yamagata lineage)
- 14,423 rapid influenza positive specimens reported by the state laboratory survey with 64 percent positive for influenza A
- 10,301 positive non-influenza respiratory specimens reported to IISN with rhinovirus/enterovirus and respiratory syncytial virus (RSV) accounting for 56 percent of the positive results
- over one million influenza vaccines were reported to Iowa’s immunization tracking system
- 270 influenza-related deaths were reported which was more than during the same time period during 2015-16 and 2016-17 combined
- 1,889 (96 per 10,000 hospitalizations) hospitalizations were reported from sentinel sites which was more than a 50 percent increase compared to 2016-17 (1,078 and 63 per 10,000)
- weekly percentage of outpatient visits for ILI in Iowa was above the regional baseline of 1.9 percent for nine weeks in a row from week 52 in December 2017 through week eight in February 2018 and peaked MMWR week 4 in January 2018 at 3.7 percent
- 90 influenza outbreaks in long-term care facilities were investigated compared to 56 outbreaks during the same period in the 2016-17 season
- 229 schools reported over 10 percent absenteeism due to illness at least once during the year, with schools in 75 counties reporting 10 percent illness at least once
- percent of ill students at sentinel schools rose above the baseline 15 times and peaked at 4.5 percent in MMWR week 6 in February 2018

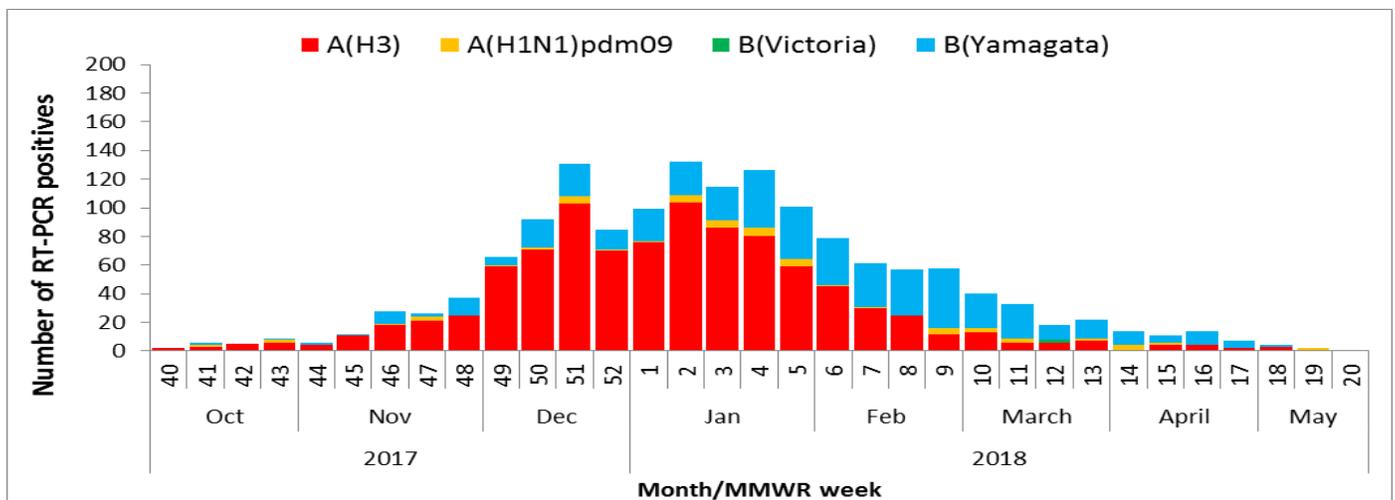
### Laboratory surveillance program

SHL is the primary laboratory in Iowa characterizing specimens for influenza surveillance. SHL reports the number of tests performed and the type and subtype/lineage of positive tests to the influenza surveillance network daily. SHL also sends a portion of specimens to CDC for further characterization.

There were 2,426 specimens tested for influenza at SHL October 1, 2017-May 19, 2018, with 1,510 total positive specimens. The number of specimens testing positive for influenza peaked in MMWR week 2 in January with 133 positive specimens detected that week (Figure 1). The positive specimens included 1028 (71%) influenza A and 413 (29%) influenza B viruses. Among the 1,021 influenza A specimens subtyped, 962 (94%) were influenza A (H3N2), and 57 (6%) were influenza A(H1N1)pdm09. Iowa reported two human infections with novel influenza A during the 2017-2018 influenza season, one influenza A(H1N2) variant or A(H1N2)v and one influenza A(H3N2)v. Both infections were associated with exposure to swine. No human to human transmission was reported. Of the 479 influenza B positive specimens with lineage information available, 477 (>99%) were identified as B/Yamagata and two (<1%) as B/Victoria lineage (Table 1).

Of the 1,510 influenza-positive specimens tested, 684 (45%) were from persons over 64 years of age. Influenza A(H3N2), A(H1N1)pdm09, and B(Yamagata) viruses were identified in all age groups with A(H3N2) being predominant in all age groups, except for persons age 5-17 where A(H3N2) and B(Yamagata) both accounted for 47 percent of infections (Table 1).

**Figure 1. Number of laboratory confirmed influenza specimens by influenza type and strain, October 1, 2017 - May 19, 2018**



**Table 1: Influenza A and B viruses detected by SHL by age group, October 2, 2016 – May 20, 2017**

Age Group	Influenza A					Influenza B			Total
	A(H1N1)pdm09	A variants	A (H3)	Not subtyped	Total	Victoria Lineage	Yamagata Lineage	Unknown Lineage	
0-4	10	0	73	1	84 (8%)	0	22	1	23 (5%)
5-17	8	0	82	1	91 (9%)	0	83	1	84 (17%)
18-24	11	1	128	0	140 (14%)	1	54	0	55 (11%)
25-49	11	1	77	1	90 (9%)	1	60	0	61 (13%)
50-64	10	0	113	1	124 (12%)	0	73	1	74 (15%)
>64	7	0	489	3	499 (49%)	0	185	0	185 (38%)
<b>Total</b>	<b>57 (6%)</b>	<b>2 (0%)</b>	<b>962 (94%)</b>	<b>7 (1%)</b>	<b>1028</b>	<b>2 (0%)</b>	<b>477 (99%)</b>	<b>3 (1%)</b>	<b>482</b>

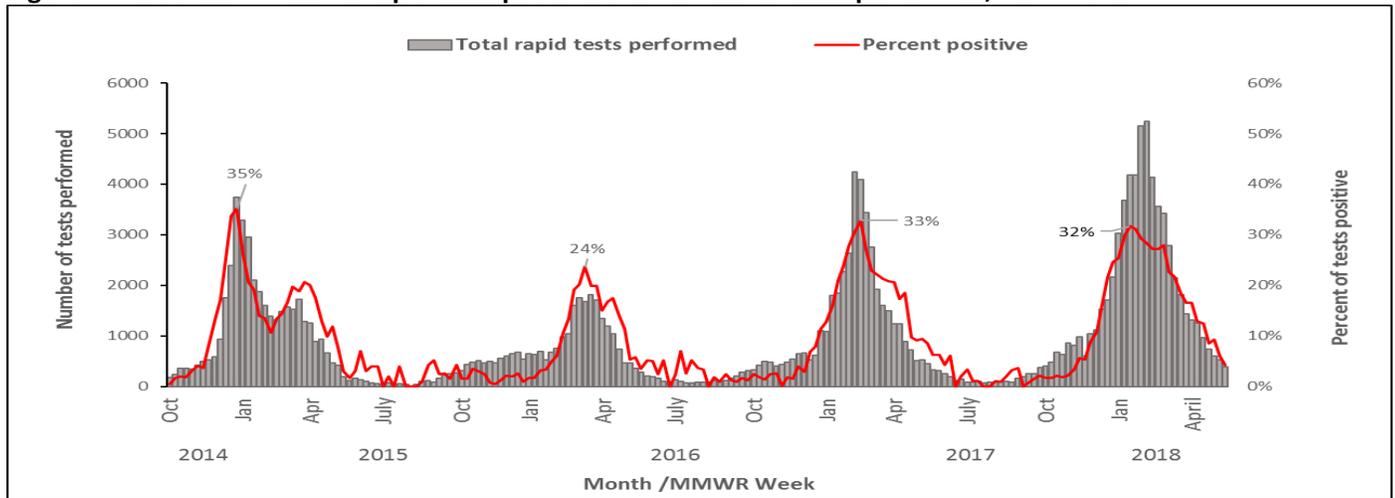
Notes: Only cases of Iowa residents are included. "Not subtyped" or "unknown lineage" columns are due to weak detections. This can be due to poor collection, timing of collection or stage of infection.

### **Rapid influenza and RSV test surveillance**

SHL has a weekly web-based survey program where laboratorians in Iowa report the number of influenza and RSV rapid tests performed and the number of tests positive. Only the total number of patients tested and the number positive for influenza or RSV at each laboratory are reported, not individual results.

Figure 2 shows the percentage of positive rapid influenza tests and the number of tests performed September 28, 2014 (MMWR week 40) – May 19, 2018 (MMWR week 20). There were 63,572 specimens tested for influenza October 1, 2017-May 19, 2018, with 14,423 total positive specimens (23% positive total – 9161 influenza A and 5,262 influenza B). During the 2017-2018 influenza season, the percent of positive influenza rapid tests was above 10 percent for 20 consecutive weeks, from the first week in December 2017 through the third week in April. The positivity rate peaked at 32 percent in the third week in January 2018.

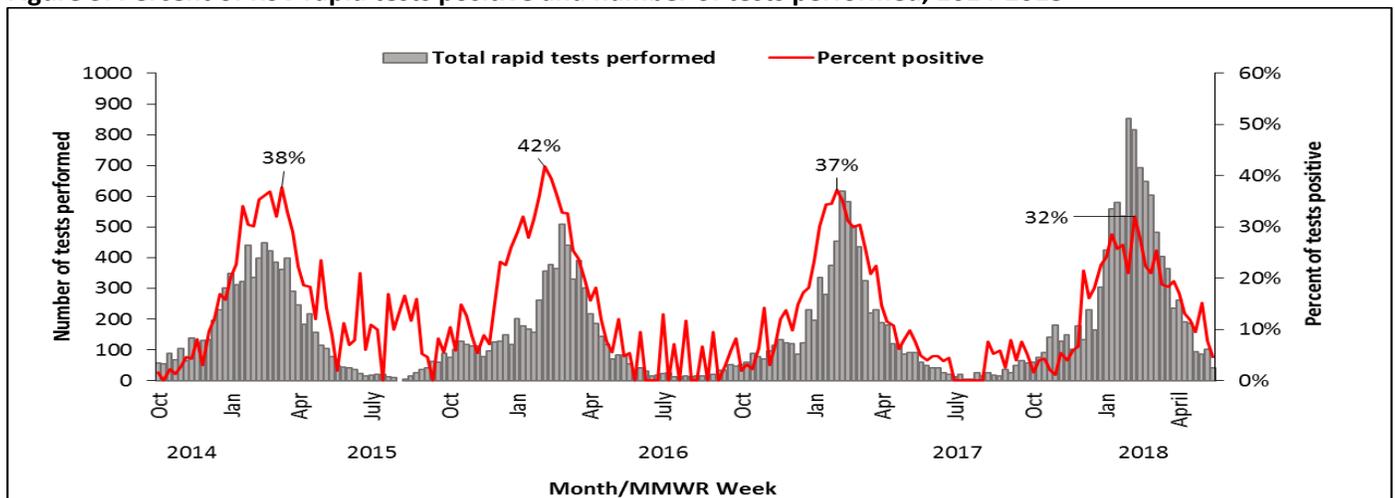
**Figure 2. Percent of influenza rapid tests positive and number of tests performed, 2014-2018**



Note: survey not collected MMWR week 53 in Dec 2014/Jan 15 and MMWR week 31 July/Aug 2015.

Figure 3 shows the percentage of positive rapid RSV tests and the number of tests performed September 28, 2014 (MMWR week 40) – May 29, 2018 (MMWR week 20). There were 10,115 specimens tested October 1, 2017-May 19, 2018, with 2,105 total positive specimens (21% positive total). The percent of positive RSV rapid tests increased dramatically the first week in December 2017, peaked at 32 percent the first week in February 2018, and did not drop below five percent until the week 19 in May 2018.

**Figure 3. Percent of RSV rapid tests positive and number of tests performed, 2014-2018**



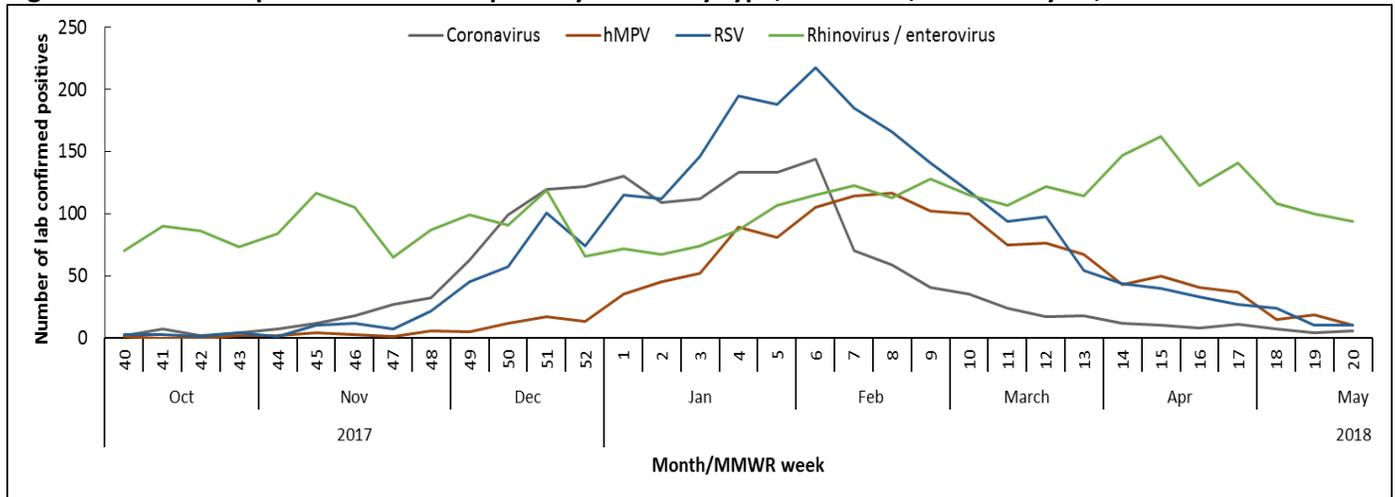
Note: survey not collected MMWR week 53 in Dec 2014/Jan 15 and MMWR week 31 July/Aug 2015.

### Non-influenza respiratory viruses

SHL also collects information on non-influenza respiratory virus testing with their weekly web-based survey. This information is added to reports from the Dunes Medical Laboratories at Mercy Medical Center in Sioux City. Only the number of patients tested and the number positive for non-influenza viruses are reported, not individual results.

For the period covering October 1, 2017 through May 19, 2018, labs surveyed by SHL and by Dunes Medical Laboratories reported 10,301 positive results for non-influenza respiratory viruses, which more than doubled the number of positive results (4,572) from the same period in the 2016-17 season. Rhinovirus/Enterovirus and RSV accounted for the majority of positive results with 3371 (35%) and 2358 (21%) respectively. Different viruses peaked at different times from October through April (Figure 4 and Table 3).

**Figure 4. Number of positive non-flu respiratory viruses by type, October 1, 2017 - May 19, 2018**



Note: only viruses with at least 10 percent of total positive results were included.

**Table 3: Number of positive results, percent of total, and month of peak for non-influenza respiratory virus collected by SHL and Mercy Dunes in Sioux City, October 1, 2017 – May 19, 2018**

Viruses	Number	Percent	Month of Peak
Adenovirus	732	7	February 2018
Parainfluenza Virus Type 1	488	4	October 2017
Parainfluenza Virus Type 2	11	<1	
Parainfluenza Virus Type 3	333	5	May 2018
Parainfluenza Virus Type 4	71	<1	
Rhinovirus/Enterovirus	3371	35	April 2018
Respiratory syncytial virus (RSV)	2358	21	February 2018
Human metapneumovirus (hMPV)	1339	12	February 2018
Coronavirus	1598	14	February 2018
<b>Total</b>	<b>10301</b>		

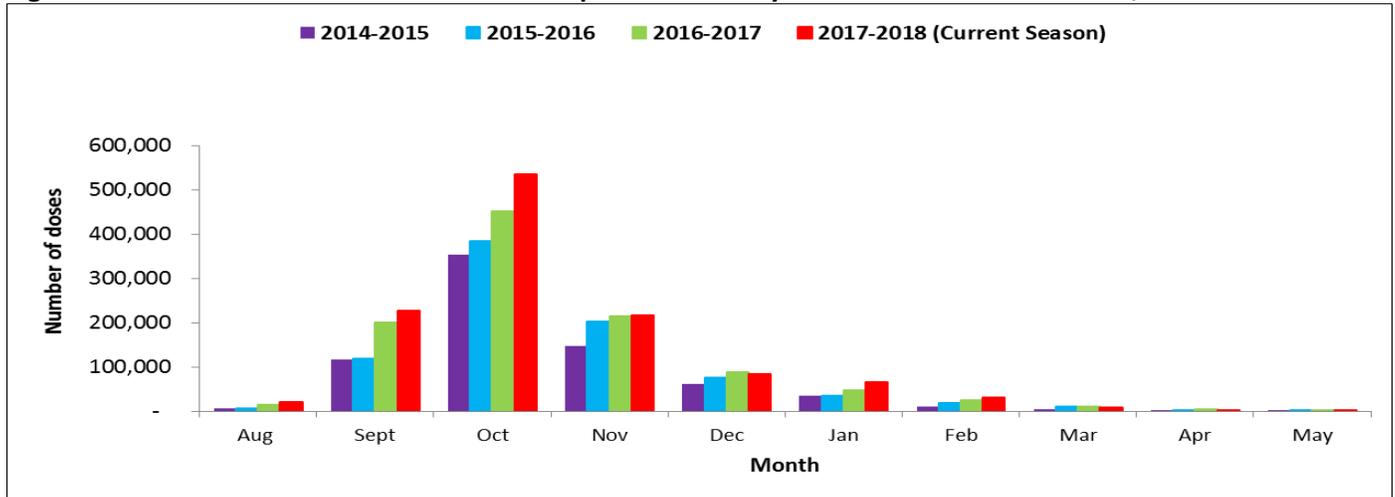
Note: peak month not reported for viruses with no weeks over 10 positive cases

### Seasonal influenza vaccination

Seasonal influenza vaccination data in Iowa is based on doses reported to the Iowa Immunization Registry Information System (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 of Iowa. For more information on the immunization data, contact Kim Tichy, IRIS coordinator at 515-281-4288 or [kimberly.tichy@idph.iowa.gov](mailto:kimberly.tichy@idph.iowa.gov).

The number of seasonal influenza vaccine doses reported to IRIS during the 2017-18 season was 1,190,026, which is higher than in each of the two previous seasons (1,059,742 in 2016-17 and 858,872 in 2015-16). Over 90 percent of doses were administered August through December 2017 (Figure 5).

**Figure 5. Doses of seasonal influenza vaccine reported to IRIS by month for influenza seasons, 2014-2018**



### Mortality surveillance

Influenza-related mortality data primarily comes from the Iowa Bureau of Health Statistics as well as reports from the Iowa Office of the State Medical Examiner if they detect unusual clusters of deaths attributed to infectious disease. Reports may also come from influenza-related pediatric deaths (under age 18 years) which are reportable in Iowa. Deaths are counted as influenza-related if the death report lists influenza as a possible contributor to the cause of death, but not necessarily the primary cause.

There were a total of 270 influenza-related deaths in Iowa for the time period from October 1, 2017 through May 19, 2018, with 161 (60%) being in persons aged 81 years and over. The number of deaths in 2017-18 was more than during the same time period during 2015-16 and 2016-17 combined (Table 4). Influenza-related deaths peaked in MMWR week 4 in January, with 114 deaths reported that month. Eighty-nine of the 135 influenza-related deaths (over 65%) occurred in February and March. Of the 270 deaths, 213 (79%) were among persons with a reported underlying health conditions.

**Table 4: Number of influenza-related deaths per season and percent by age group – weeks 40-20**

Ages	2014-15 (n=175)	2015-16 (n=44)	2016-17 (n=135)	2017-18 (n=270)
0-60	11	18	14	28
61-80	30	15	32	81
81 and over	134	11	89	161
<b>Total</b>	<b>175</b>	<b>44</b>	<b>135</b>	<b>270</b>

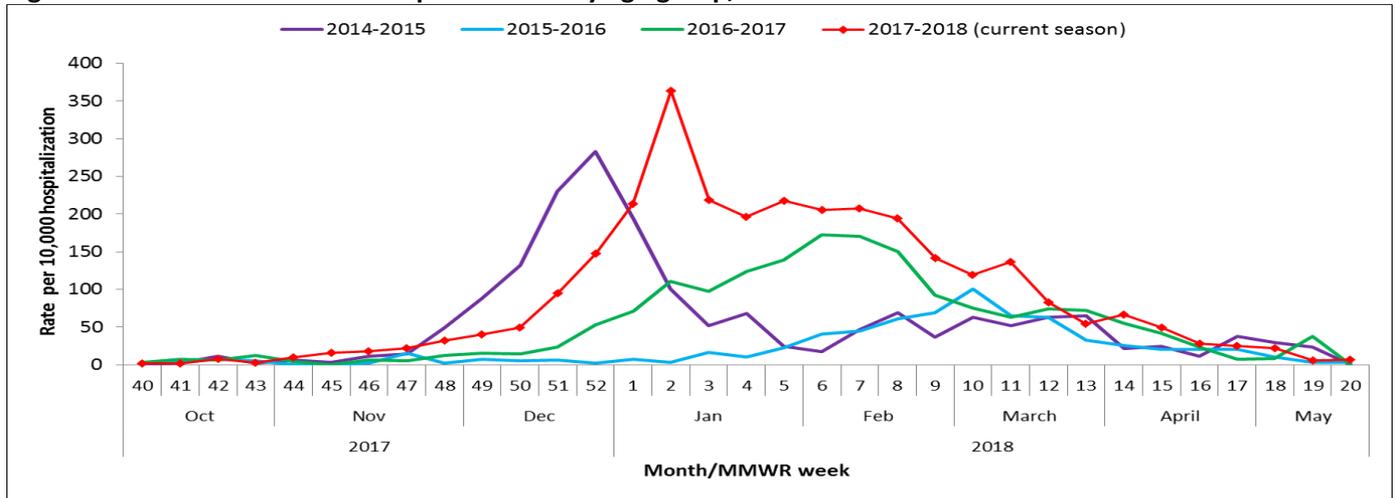
Note: only deaths that occurred during weeks 40 through 20 of each season were included

### Influenza-associated hospitalizations

Sentinel hospitals track and report the number of influenza-associated hospitalizations and the total number of inpatients each week. Twenty-four sentinel hospitals participated in the influenza hospitalization surveillance in the 2017-18 influenza season. These hospitals tracked and reported the number of influenza-associated hospitalizations by age group (0-4, 5-24, 25-49, 50-64, and over 64 years) and the total number of inpatients hospitalized for any reason.

Both number and rate of hospitalizations peaked in January with 203 hospitalizations in week 1 and a rate of 363 influenza-associated hospitalizations per 10,000 total hospitalizations in week 2 (Figure 6). The number and rate of influenza-associated hospitalizations was higher in 2017-18 (1,889 and 96 per 10,000) compared to 2016-17 (1,078 and 63 per 10,000, see Table 5).

**Figure 6. Influenza-associated hospitalizations by age group, 2014 – 2018**



**Table 5: Number of influenza-associated hospitalization and percent reported by age group, October 1, 2017 – May 19, 2018**

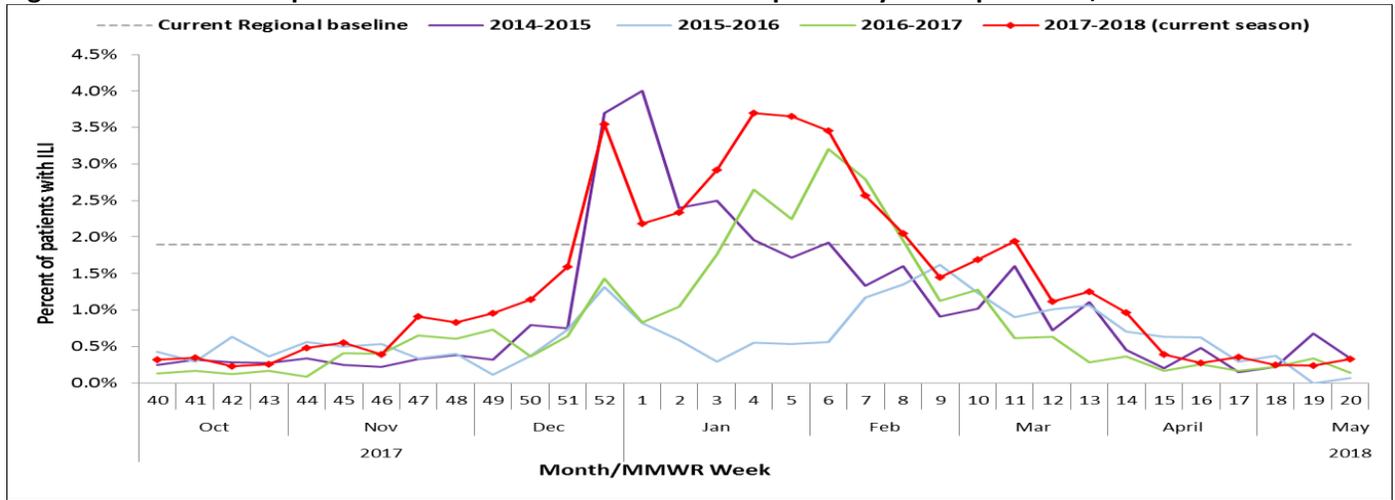
AGE	Number Hospitalizations	Percent
Age 0-4	124	7
Age 5-24	99	5
Age 25-49	169	9
Age 50-64	344	18
Age >64	1153	61
<b>Total</b>	<b>1889</b>	

**Outpatient health care provider surveillance program (ILINet)**

Sentinel outpatient health care providers participating in the ILINet national influenza surveillance program report the number of patients seen with influenza-like illness and the total number of patient visits each week. This system is a key part of Iowa’s influenza surveillance. Across the state, providers, ranging from family medicine to student health centers, participate weekly in the ILINet program. Influenza-Like Illness is defined as a fever of at least 100°F plus either a cough or a sore throat.

Sixteen sentinel surveillance sites participated in ILINet during the 2017-2018 season. During the 2017-18 influenza season, the weekly percentage of outpatient visits for ILI in Iowa was above the regional baseline of 1.9 percent for nine weeks in a row from week 52 in December 2017 through week eight in February 2018. As shown in Figure 7, ILI percentage peaked MMWR week 4 in January at 3.7 percent.

**Figure 7. Percent of outpatient visits for influenza-like illness reported by ILINet providers, 2014-2018**



**Long-term care outbreaks**

Influenza outbreaks in long-term care facilities are reported to IDPH directly or through local public health providers. Long-term care facilities are defined as institutions, such as nursing homes and skilled nursing facilities that provide health care to people (including children) who are unable to manage independently in the community. A long-term care influenza outbreak should be suspected if there is one laboratory-confirmed influenza positive case along with other cases of respiratory infection in a unit of a long-term care facility.

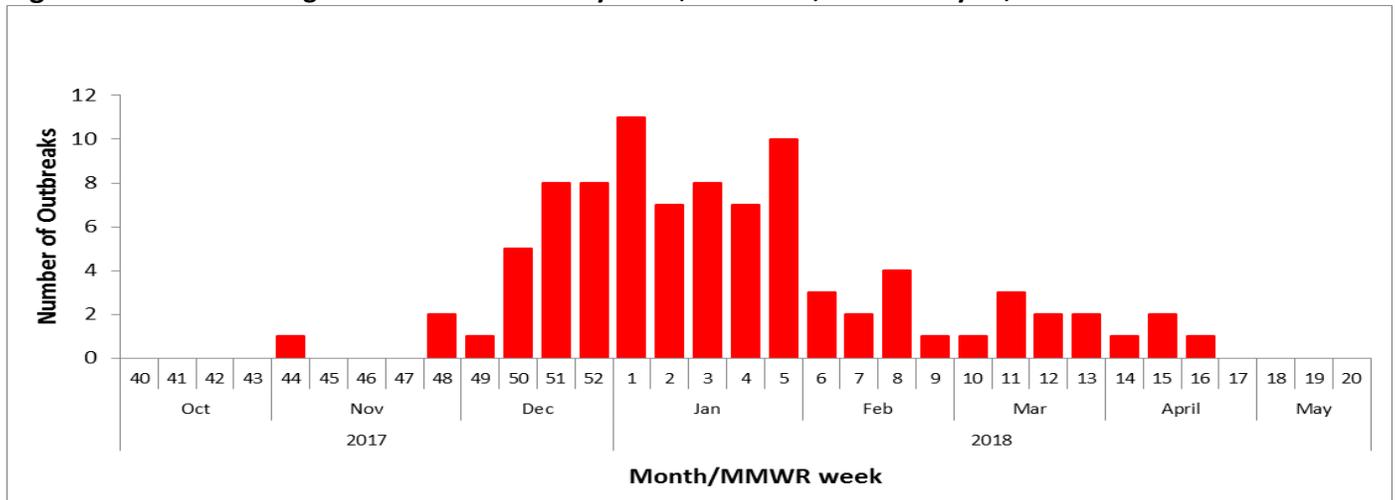
There were a total of 90 long-term care influenza outbreaks reported for the time period from October 1, 2017 through May 19, 2018 with at least five outbreaks in each region of Iowa (Table 6). The number of influenza outbreaks peaked with 11 outbreaks in the first week of January 2018 (Figure 8). During the same period in the 2016-17 season, 56 influenza outbreaks in long-term care facilities were investigated.

**Table 6: Number of long-term care outbreaks investigated by region, October 1, 2017 – May 19, 2018**

REGION*	Number Outbreaks
Region 1 (Central)	21
Region 2 (NE)	12
Region 3 (NW)	5
Region 4 (SW)	13
Region 5 (SE)	19
Region 6 (Eastern)	20
<b>Total</b>	<b>90</b>

Note: See map in the school section for a display of the counties in each region.

**Figure 8. Number of long-term care outbreaks by week, October 1, 2017 – May 19, 2018**



**School surveillance program**

IDPH monitors illnesses in schools (K-12) from two different types of reporting: 10 percent school absence reports and weekly sentinel illness reporting. Iowa schools track and report when the number of students absent with illness (including non-influenza illnesses) reaches or exceeds 10 percent of total student enrollment. Iowa sentinel schools that participate in IISN voluntarily track and report absence due to all illness and the total enrollment each week. IDPH tracks more than 60,000 students weekly for absence due to illness. This data provides excellent trends for influenza activity as well as age-specific information used to target vaccination efforts and messages.

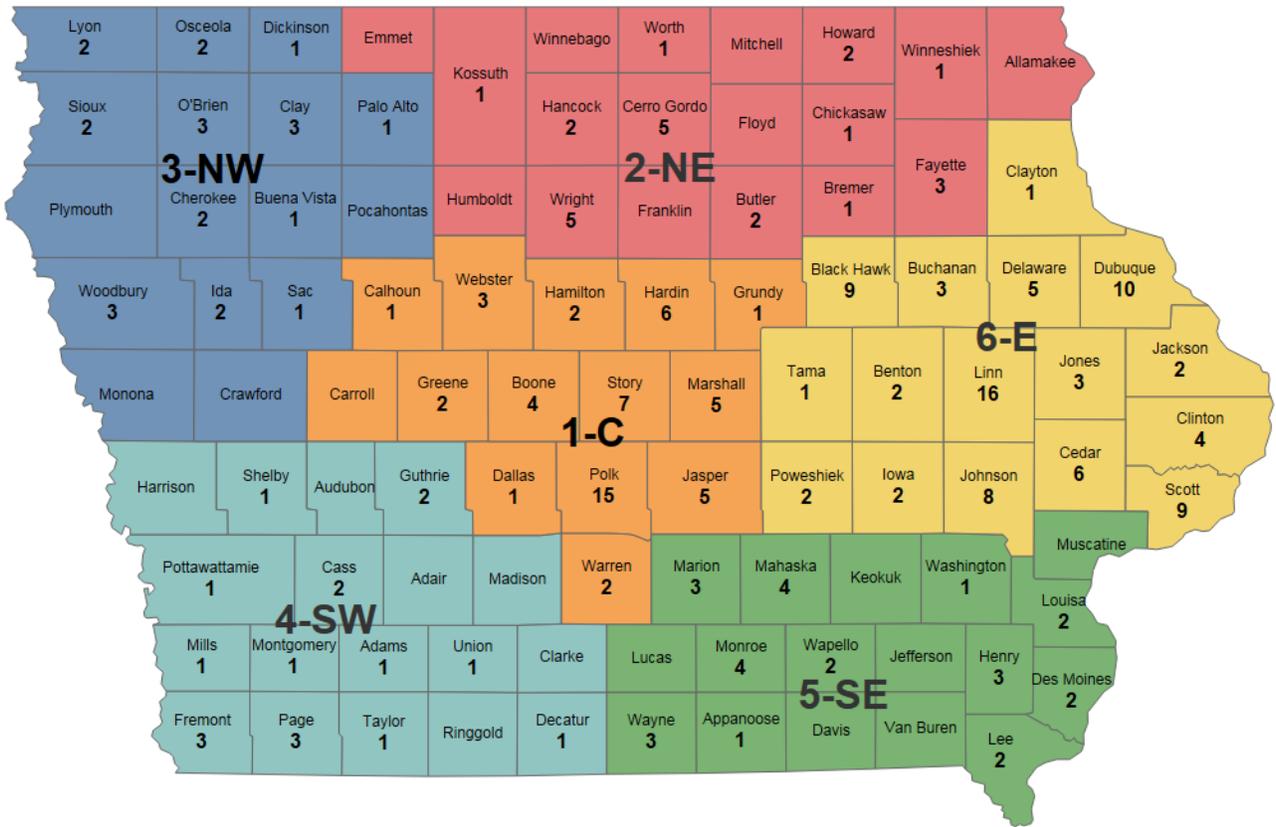
During the 2017-2018 influenza season, 229 schools reported over 10 percent absenteeism due to illness at least once during the year. Each school is counted only once per season. The number of schools with 10 percent ill peaked at 64 during the week ending February 10 (MMWR week 6). At least 15 schools in every region reported 10 percent illness (Table 7) and 75 counties reported at least one school with 10 percent illness during the year (Figure 9).

**Table 7: Number of schools with at least 10 percent absenteeism due to any illness, October 1, 2017-May 28, 2018**

REGION*	Number of Schools
Region 1 (Central)	57
Region 2 (NE)	24
Region 3 (NW)	23
Region 4 (SW)	18
Region 5 (SE)	26
Region 6 (Eastern)	81
<b>Total</b>	<b>229</b>

Note: See map in the school section for a display of the counties in each region.

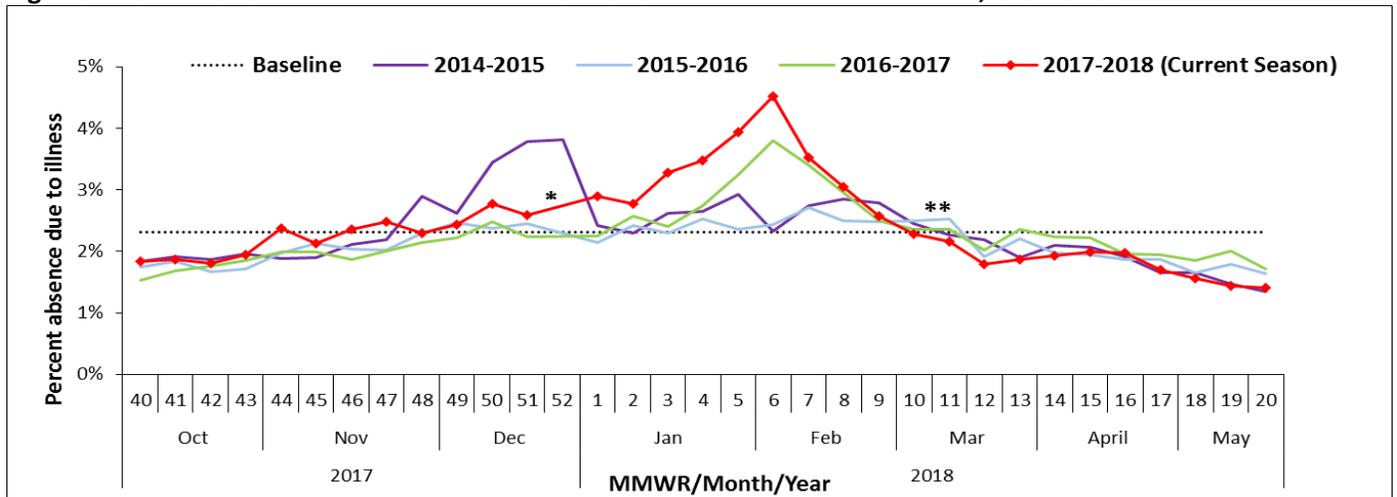
**Fig 9. Schools with at least ten percent illness by county and region**



Note: The number of schools by county that reported 10 percent absence due to illness at least once for the 2017-2018 influenza season are listed below each county. Region numbers and abbreviations are listed in black.

During the 2017-2018 influenza season, the percent of students absent due to illness from sentinel schools went above the 2.31 percent baseline 15 times including nine consecutive weeks in January and February (Figure 10). The percentage peaked at 4.5 percent in MMWR week 6 in February 2018.

**Figure 10 Percent of enrolled students absent due to illness from sentinel school, 2014-2018**



Notes: \*School data not reported for week 52 due to holiday closings,  
 \*\*School data may underestimate influenza illness for week 11 when many schools closed for spring break