Section 6

Influenza and Influenza-Like Illness Surveillance

Influenza and Influenza-Like Illness Surveillance

Background

Influenza, or flu, is a respiratory infection caused by a variety of flu viruses. The Centers for Disease Control and Prevention (CDC) estimate that each year, 5-20% of the U.S. population develop illness from influenza, 200,000 are hospitalized, and 3,000 to 49,000 die. Most experts believe that influenza viruses spread mainly by droplets made when infected people cough, sneeze, or talk. Less often, a person might also become infected with influenza by touching a surface or object contaminated with influenza virus then touching their own mouth, eyes, or possibly nose. The best way to prevent influenza is to get vaccinated each year.

Influenza A and B viruses routinely spread through the human population and are responsible for seasonal influenza epidemics each year. Influenza A viruses are more commonly associated with the ability to cause epidemics or pandemics than influenza B. Over the course of a flu season, different subtypes of influenza A and B can circulate and cause illness.

Influenza surveillance is conducted to detect changes in the influenza virus, which helps determine the vaccine composition each year, and prepare for epidemics and pandemics. Surveillance is also conducted to identify unusually severe presentations of influenza; detect outbreaks; and determine the onset, peak, and wane of influenza season to assist with influenza prevention, particularly in high-risk populations like the very young, the elderly, and pregnant women.

Individual cases of influenza are not reportable in Florida, with the exception of novel influenza (a new subtype of influenza) and influenza-associated pediatric deaths. All outbreaks, including those due to influenza or influenza-like illness (ILI), are reportable in Florida. DOH conducts regular surveillance of influenza and ILI using a variety of surveillance systems, including laboratory data and syndromic surveillance. Florida's syndromic surveillance system, ESSENCE-FL, collects chief complaint data from emergency departments (EDs) and urgent care centers (UCCs). During the 2014-15 influenza season, 237 facilities submitted data to ESSENCE-FL, capturing 87% of all ED visits in Florida.

The influenza reporting year is defined by standard reporting weeks as outlined by CDC, where every year has at least 52 reporting weeks and some years have 53; there were 53 weeks in 2014. In Florida, increased surveillance for influenza begins in week 40 (September 28, 2014) of one year and ends in week 20 of the following year (May 23, 2015). Florida produces a weekly report during influenza season (October through May) and a biweekly report during the summer months that summarizes influenza and ILI surveillance data. These reports can be found at www.FloridaHealth.gov/FloridaFlu.

General Trends

The 2014-15 influenza season in the U.S. spanned from late November to early January with a peak in late December. Compared to national trends, influenza activity in Florida increased earlier (in late August and particularly in children), peaked at a similar time (mid-December), and lasted longer.

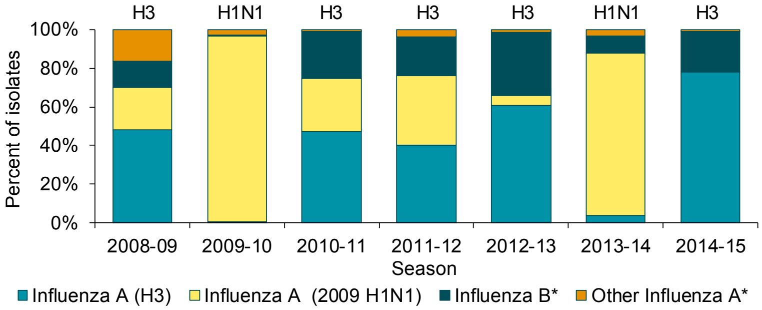
Influenza seasons typically have a predominately circulating strain, which varies by season (Figure 1). Influenza A (H3) was the predominately circulating strain in Florida and nationwide in the 2014-15 season (Figure 2). The previous predominately influenza A (H3) seasons are 2010-11, 2011-12, and 2012-13 (Figure 1).

Figure 1. Predominately Circulating Influenza Strain by Season, 2008-09 to 2014-15, Florida

Influenza A (2009 H1N1)	Influenza A (2009 H1N1)	Influenza A (H3)	Influenza A (H3)	Influenza A (H3)	Influenza A (2009 H1N1)	Influenza A (H3)
2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15

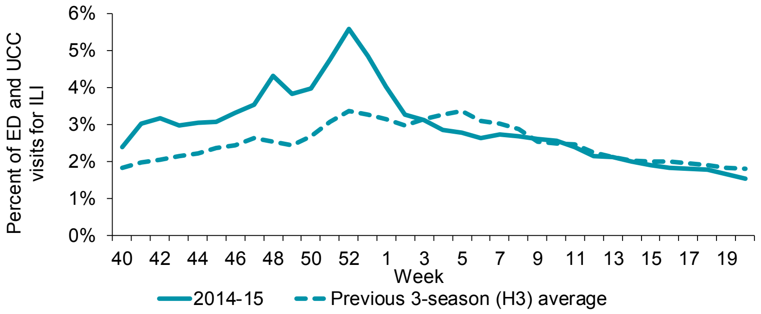
Seasons where influenza A (H3) predominates are typically associated with higher morbidity and mortality, particularly in adults ≥65 years old and children ≤4 years old. The defining characteristic of the 2014-15 season was its increased severity, both nationally and in Florida, even when compared to other predominately influenza A (H3) seasons. The CDC conducts surveillance for laboratory-confirmed influenza-associated hospitalizations in 5 states. The 2014-15 season had the highest recorded rate since surveillance began in 2005, with the majority of hospitalizations occurring in adults ≥65 years old. In Florida, the percent of weekly ED and UCC visits for ILI this season was consistently higher, with a peak percent of ED and UCC ILI visits over 1.5 times higher than the previous 3-season (H3) average peak[1] (Figure 3).

Figure 2: Influenza Subtype by Influenza Season, 2008-09 to 2014-15, Florida



* Note that influenza B lineages include Victoria, Yamagata, and unspecified lineages. Other influenza A strains include (H1) seasonal, (2009 H1N1) equivocal, and unspecified strains. An equivocal test result indicates questionable presence of virus detected.

Figure 3: Percent of Weekly Emergency Department (ED) and Urgent Care Center (UCC) Visits for Influenza-Like Illness (ILI) from ESSENCE-FL (259 Facilities), 2014-15 Season and 3-Season (H3) Average (2010-11, 2011-12, and 2012-13), Florida

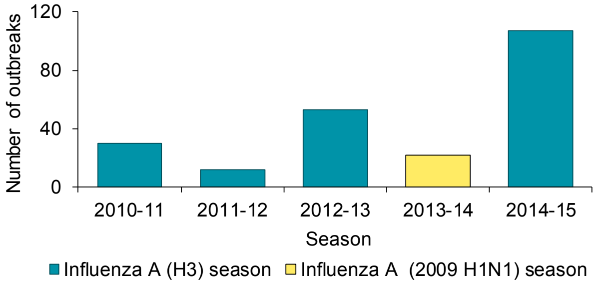


In the spring of 2014, CDC first identified an antigenically drifted influenza A (H3) strain (A/Switzerland/9715293/2013 (H3N2)-like virus) not included in the 2014-15 influenza vaccine formulations. In Florida, 60% of influenza A (H3) specimens sent to CDC for further characterization were antigenically characterized as the drifted strain, compared to 80% nationwide. Widespread circulation of the drifted strain was attributed to reduced protection against influenza infection. Vaccine efficacy was 19% (95% confidence interval of 7-29%), meaning that the frequency of influenza infection necessitating a visit to a health care provider among the vaccinated population was reduced by 19% compared to the unvaccinated population. Higher morbidity and mortality this season in adults ≥65 years old is attributed in part to the low vaccine efficacy in conjunction with the typical high severity of an influenza A (H3) season.

Outbreaks

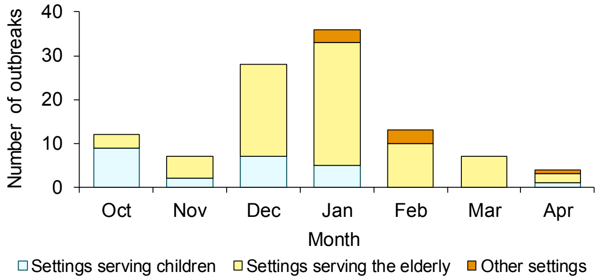
The number of reported outbreaks and the types of outbreak settings vary each season and are indicators of disease severity and population affected (Figure 4). More than three times as many outbreaks were reported in the 2014-15 season (107 outbreaks) than the previous 3-season (H3) average[1] (32 outbreaks). Consistent with other influenza A

Figure 4: Number of Outbreaks by Influenza Season and Predominately Circulating Strain, 2010-11 to 2014-15, Florida



(H3) seasons, the most affected populations in the 2014-15 season were children and the elderly. Outbreaks in settings serving children (daycare facilities, child care facilities, child development centers, schools, head start facilities, and pre-kindergarten facilities) accounted for 22% of outbreaks in the 2014-15 season, compared to the previous 3-season (H3) average[1] of 27% (Figure 5). Outbreaks in settings serving the elderly (assisted living facilities, senior care facilities, nursing homes, and long-term care facilities) accounted for 71% of outbreaks in the 2014-15 season, compared to the previous 3-season (H3) average[1] of 62%. Outbreaks in facilities serving children were reported in the beginning of the season. As the season progressed, outbreaks shifted primarily to facilities serving the elderly. Influenza activity is typically identified in children first, then spreads to other age groups (Figure 5).

Figure 5: Number of Outbreaks by Setting Type* and Month, 2014-15 Season, Florida



* Note that settings serving children include daycare facilities, child care facilities, child development centers, schools, head start facilities, and pre-kindergarten facilities. Settings serving the elderly include assisted living facilities, senior care facilities, nursing homes, and long-term care facilities.

Deaths

Influenza-associated pediatric deaths are reportable in Florida and typically between two and eight deaths are reported each year. Three deaths were reported in children in the 2014-15 season, none of whom had received their seasonal influenza vaccination. Two of the three children also had underlying health conditions.

Although not individually reportable, pneumonia and influenza deaths are monitored through review of data recorded on death certificates. The number of pneumonia and influenza deaths increases with age. There was an increase in deaths in people ≥65 years old in the 2014-15 season when compared to previous influenza A (H3) and influenza A (2009 H1N1) seasons (Table 1).

Table 1: Number of Pneumonia and Influenza Deaths by Age and Season, 2010-11 to 2014-15, Florida

Age group (in years)	5-season trend	Season				
		2010-11	2011-12	2012-13	2013-14	2014-15
0-4		50	37	37	46	25
5-24		64	62	63	56	48
25-64		1,853	1,742	1,970	2,188	2,051
≥65		7,820	7,784	8,681	8,172	9,437

[1] Previous 3-season (H3) average includes the previous three influenza A (H3) seasons, which were 2010-11, 2011-12, and 2012-13.

References

Centers for Disease Control and Prevention. 2014-2015 Flu Season. Available at www.cdc.gov/flu/about/season/index.htm.

Appiah G, Blanton L, D'Mello T, Kniss K, Smith S, Mustaquim D, et al. 2015. Influenza Activity — United States, 2014-15 Season and Composition of the 2015-16 Influenza Vaccines. Morbidity and Mortality Weekly Report, 63(21):583-590. Available at www.cdc.gov/mmwr/preview/mmwrhtml/mm6421a5.htm.