

## **Section 6**

# **Influenza and Influenza-Like Illness Surveillance**



## Background

Influenza, or flu, is a respiratory infection caused by a variety of influenza viruses. The Centers for Disease Control and Prevention (CDC) estimates that each year, 5-20% of the U.S. population develop illness from influenza, 200,000 are hospitalized, and 3,000-49,000 die. Most experts believe that influenza viruses spread mainly by droplets made when infected people cough, sneeze, or talk. Less often, a person might 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 viruses. Over the course of an influenza season, different subtypes of influenza A and B may 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. The Florida Department of Health 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 and urgent care centers. During the 2015-16 influenza season, 265 facilities submitted data into ESSENCE-FL, capturing 96% of all emergency department visits in Florida.

The influenza reporting year is defined by standard reporting weeks as outlined by CDC, where every year has a minimum of 52 reporting weeks and some years have 53; there were 52 weeks in 2015. In Florida, increased surveillance for influenza begins in week 40 (October 4, 2015) of one year and ends in week 20 of the following year (May 21, 2016). 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 are available at [www.FloridaHealth.gov/FloridaFlu](http://www.FloridaHealth.gov/FloridaFlu).

## General Trends

Nationally, increased activity associated with the 2015-16 influenza season in the U.S. spanned from late December to late April, peaking in early March. Influenza activity in Florida mirrored these trends. In Florida, the 2015-16 influenza season peaked between December and February, later than it had in the past six seasons.

Influenza seasons typically have a predominately circulating strain, which can vary by season (Figure 1). Influenza A 2009 (H1N1) was the predominately circulating strain in Florida and nationwide in the 2015-16 season (Figure 2).

Figure 1. Predominately Circulating Influenza Strain by Season, 2008-09 to 2015-16, Florida

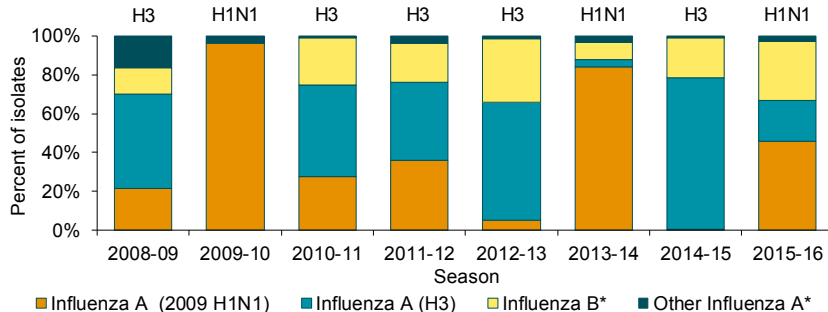
Influenza A (2009 H1N1)	Influenza A (2009 H1N1)	Influenza A (H3)	Influenza A (H3)	Influenza A (H3)	Influenza A (2009 H1N1)	Influenza A (H3)	Influenza A 2009 (H1N1)
2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16

# Influenza and Influenza-Like Illness Surveillance

In the U.S. and in Florida, influenza A (H3) viruses were the most commonly identified between October and December (Figure 3). By the end of the season, a larger proportion of influenza A (H3) viruses had been detected in Florida compared to the rest of the nation, suggesting that influenza A (H3) viruses may have circulated more widely in Florida than in the rest of the nation (Figure 4). Both in the U.S. and Florida, influenza B viruses circulated throughout the season and made up similar proportions of the total influenza-positive specimens detected (29.2% and 30.2% respectively). In Florida, influenza B Victoria viruses made up a larger proportion of the influenza B viruses for which lineage was determined compared to the rest of the nation, suggesting that influenza B Victoria lineage viruses may have circulated more widely in Florida than in the rest of the nation (Figure 5).

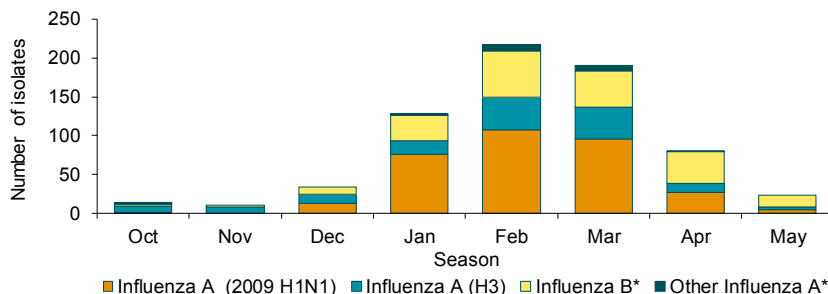
The 2015-16 influenza season marked the second post-pandemic season where influenza A 2009 (H1N1) was the predominantly circulating strain (the first was the 2013-14 season). Influenza activity in the 2015-16 season had a considerably higher and later peak in the percentage of people seeking medical care at emergency departments and urgent care centers for influenza and ILI than in the most recent influenza A 2009 (H1N1) season (Figure 6).

Figure 2: Influenza Subtype by Influenza Season, 2008-09 to 2015-16, 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: Influenza Subtype by Month of Influenza Season, 2015-16, 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 4: Influenza A Subtypes, 2015-16, Florida and U.S.

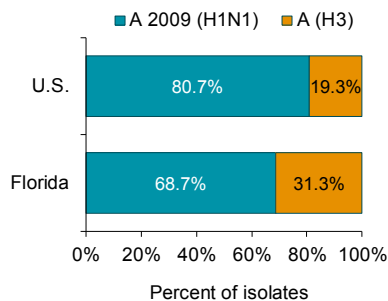


Figure 5: Influenza B Subtypes, 2015-16, Florida and U.S.

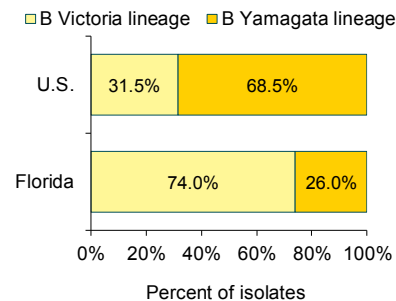
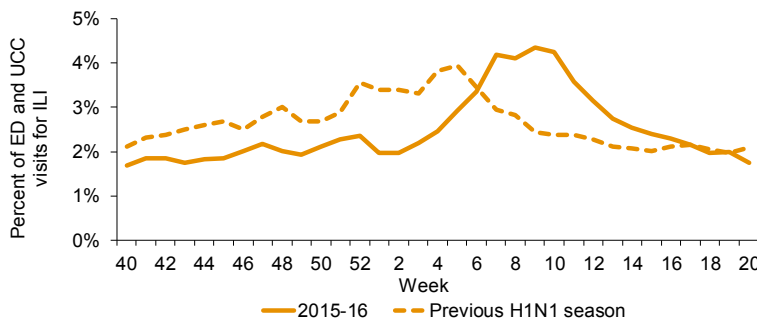


Figure 6: Percent of Weekly Emergency Department (ED) and Urgent Care Center (UCC) Visits for Influenza-Like Illness (ILI) from ESSENCE-FL (265 Facilities), Previous Influenza A 2009 (H1N1) Season (2013-14) and 2015-16, Florida



## Outbreaks

The number of outbreaks reported and the types of outbreak settings vary each season and are indicators of disease severity and population affected (Figure 7, Figure 8). More than twice as many outbreaks were reported in the 2015-16 season (58 outbreaks) compared to the most recent influenza A 2009 (H1N1) season in 2013-14 (22 outbreaks). In the 2015-16 season, a larger proportion of outbreaks were reported in facilities serving children and the elderly compared to the 2013-14 season. Likewise, a larger proportion of outbreaks in facilities serving the elderly were reported in the 2015-16 season compared to the last season where influenza A 2009 (H1N1) circulated predominantly. In the 2015-16 season, half of all outbreaks were reported in March when peak influenza activity occurred (Figure 9). In the 2014-15 season, early season outbreaks were observed in facilities serving children before progressing into facilities serving other age groups. This pattern was not observed in the 2015-16 season. This could be partially due to the delay in influenza activity until much later in the season.

Figure 7: Outbreaks by Influenza Season and Predominately Circulating Strain, 2010-11 to 2015-16, Florida

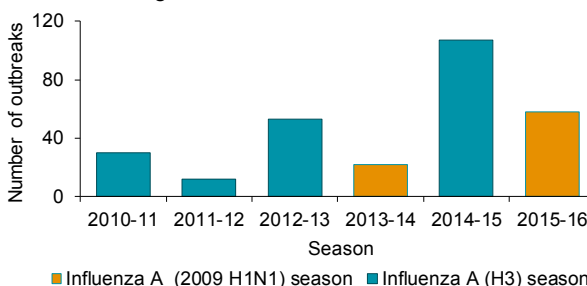


Figure 8: Outbreaks by Setting Type\* and Season, Previous Influenza A 2009 (H1N1) Season (2013-14) and 2015-16, Florida

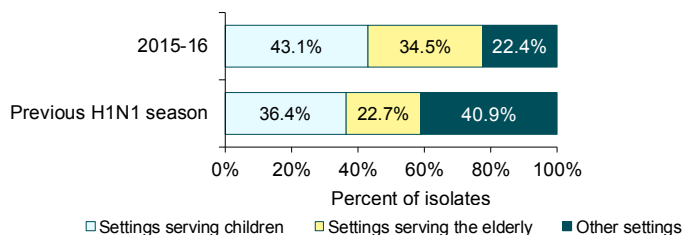
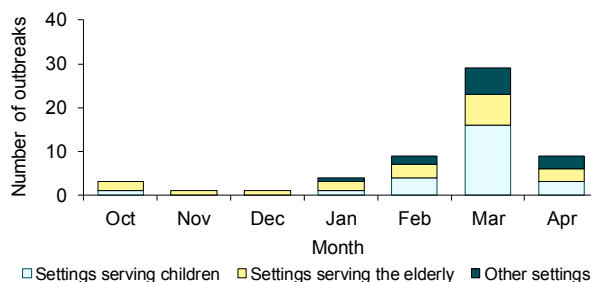


Figure 9: Outbreaks by Setting Type\* and Month, 2015-16 Season, Florida

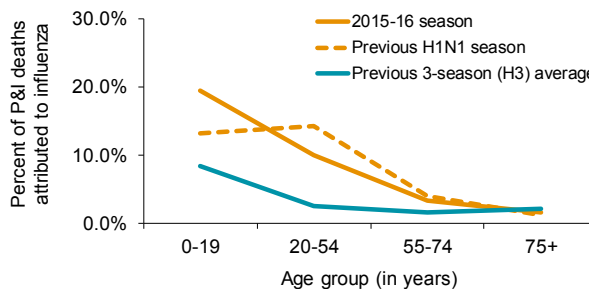


\* Note that settings serving children include daycare facilities, child care facilities, child development centers, schools, head start facilities, and pre-kindergarten facilities. Settings serving the elderly include assisted living facilities, senior care facilities, nursing homes, and long-term care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

## Deaths

Influenza-associated pediatric deaths are reportable in Florida; typically two to eight deaths are reported each year. Seven deaths were reported in children in the 2015-16 season and one additional death was reported in early June. Of the eight children who died, five had not received their seasonal influenza vaccination and five had underlying health conditions. Specimens from children who die are frequently not typed, and given the small number of deaths each year, it is difficult to interpret how pediatric mortality is affected by strain.

Figure 10: Percentage of Pneumonia and Influenza (P&I) Deaths Attributed to Influenza by Age Group, Previous Influenza A 2009 (H1N1) Season (2013-14), Previous 3-Season A (H3) Average (2011-12, 2012-13, 2014-15), 2015-16 Season, Florida



Although not individually reportable, pneumonia and influenza deaths are monitored through death certificate data. Seasons in which influenza A 2009 (H1N1) viruses predominate have been associated with elevated morbidity and mortality in previously healthy young adults compared to seasons where influenza A (H3) predominates. Consistent with trends observed during the most recent influenza A 2009 (H1N1) season, the 2015-16 season was also characterized by elevated influenza mortality in people 20-54 years old. However, the highest proportion of pneumonia and influenza deaths attributed to influenza was observed in the 19 years and under age group (Figure 10). In both influenza A 2009 (H1N1) seasons, a notably higher proportion of pneumonia and influenza deaths were attributed to influenza in the 0-19- and 20-54-year age groups compared to the previous three-season influenza A (H3) average.

### References

Centers for Disease Control and Prevention. 2015-2016 Flu Season.  
Available at [www.cdc.gov/flu/pastseasons/index.htm](http://www.cdc.gov/flu/pastseasons/index.htm).

Davlin SL, Blanton L, Kniss K, Mustaquim D, Smith S, Kramer N, et al. 2016. Influenza Activity — United States, 2015–16 Season and Composition of the 2016–17 Influenza Vaccine. *Morbidity and Mortality Weekly Report*, 65(22):567-575.  
Available at [www.cdc.gov/mmwr/volumes/65/wr/mm6522a3.htm](http://www.cdc.gov/mmwr/volumes/65/wr/mm6522a3.htm).