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 influenza viruses. The Centers for Disease Control and Prevention (CDC) estimates that influenza has resulted in between 9.2 million and 60.8 million illnesses, 140,000 to 710,000 hospitalizations, and 12,000 to 56,000 deaths annually since 2010 (see References). 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 and prevent severe complications or outcomes from infection 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-based surveillance and syndromic surveillance. Florida's syndromic surveillance system, ESSENCE-FL, collects chief complaint data from emergency departments and urgent care centers. During the 2016-17 influenza season, 305 facilities submitted data into ESSENCE-FL, capturing 98% 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 2016. In Florida, increased surveillance for influenza begins in week 40 (October 2, 2016) of one year and ends in week 20 of the following year (May 20, 2017). 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.

General Trends

Influenza activity in Florida can vary widely from season to season, underscoring the importance of robust influenza surveillance. In Florida, increased influenza activity associated with the 2016-17 influenza season statewide spanned from late December to mid-April (Figure 1). Regional differences were observed in the timing of peak influenza activity, resulting in dual peaks. In south Florida (Palm Beach, Broward, Miami-Dade, and Monroe counties), influenza activity peaked in late December, nearly two months ahead of the rest of the state, which peaked in February. Although Florida often differs from the national influenza trends, in 2016-17, national trends generally mirrored what was observed in Florida, with peak influenza activity also occurring in February 2017.

Figure 1. State Influenza Activity Level by Week for Seasons 2012-13 to 2016-17, Florida
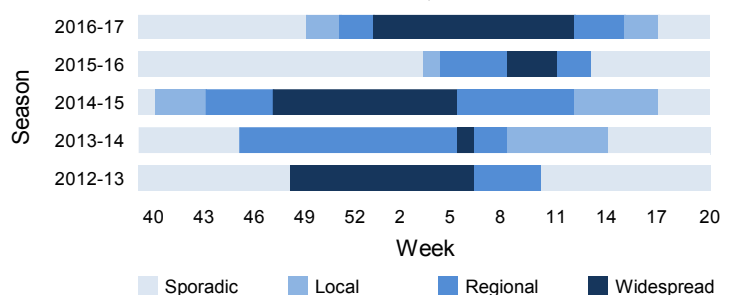
Influenza seasons typically have a predominately circulating strain, which can vary by season. Influenza A (H3) was the predominantly circulating strain in Florida and nationwide during the 2016-17 season. The previous predominantly influenza A (H3) seasons were 2010-11, 2011-12, 2012-13, and 2014-15 (Figures 2 and 3). While influenza A (H3) viruses predominated during the 2016-17 season overall, influenza B viruses were most commonly reported from late April through May (Figure 4). The late season circulation of influenza B viruses in Florida is typical.

Figure 2. Predominately Circulating Influenza Strain by Season, 2008-09 to 2016-17, Florida
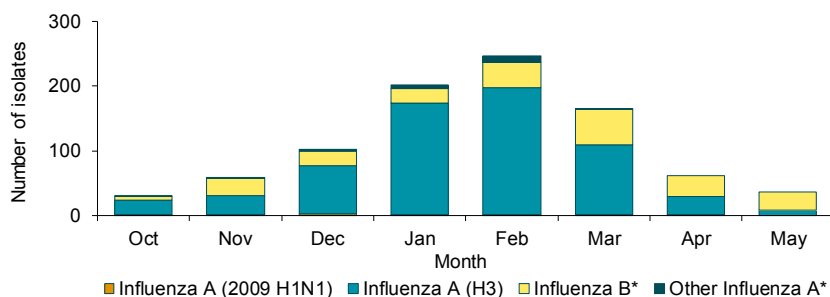
Influenza A (2009 H1N1)	Influenza A (2009 H1N1)	Influenza A (H3)	Influenza A (H3)	Influenza A (H3)	Influenza A (2009 H1N1)	Influenza A (H3)	Influenza A 2009 (H1N1)	Influenza A (H3)
2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17

Figure 3: Influenza Subtype by Influenza Season, 2008-09 to 2016-17, Florida
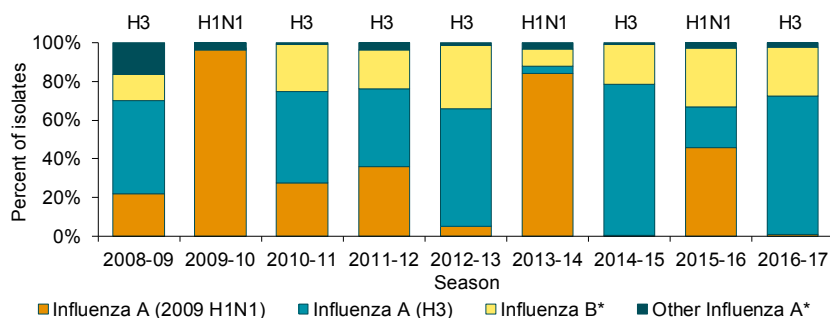
* Note that influenza B lineages include Victoria, Yamagata, and unspecified lineages. Other influenza A strains include (H1) seasonal, (2009 H1N1) equivocal, and unspecified strains. An equivocal test result indicates questionable presence of virus detected.

Figure 4: Influenza Subtype by Month of Influenza Season, October 1, 2016 to May 31, 2017, 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.

Seasons where influenza A (H3) predominates are typically associated with increased morbidity and mortality, particularly in adults aged ≥65 years old and children aged ≤4 years old. The defining characteristics of the 2016-17 season were its dual peaks (with the earlier peak being heavily influenced by the south Florida trend) and its dramatic increase in the number of outbreaks reported (see Outbreaks subsection on following page). Statewide, influenza activity during the 2016-17 influenza season peaked later than the previous three-season (H3) average (Figure 5). Peak influenza activity statewide during the 2016-17 influenza season was considerably lower than the previous three -season (H3) average; however, regional differences were observed in the severity of the season. In south Florida, peak influenza activity during the 2016-17 influenza season was 27% higher than the region's previous three-season (H3) average (Figure 6), suggesting increased severity in that region. Timing of peak activity in south Florida was consistent with the previous three-season (H3) statewide average.
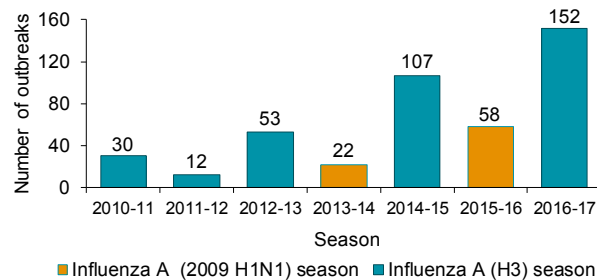
Figure 5: Percent of Weekly Emergency Department (ED) and Urgent Care Center (UCC) Visits for Influenza-Like Illness (ILI) From ESSENCE-FL (305 Facilities), 2-Season (H1N1) Average (2013-14, 2015-16), 3-Season (H3) Average (2011-12, 2012-13, 2014-15), and 2016-17 Season, Florida and South Florida
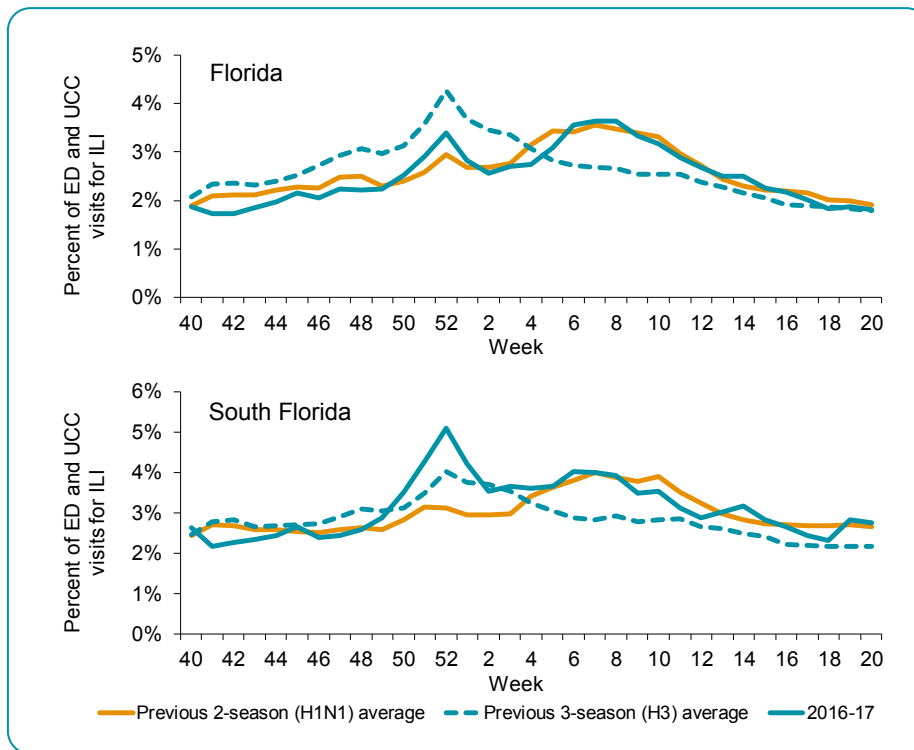
Outbreaks

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). More than three times as many outbreaks were reported in the 2016-17 season (152 outbreaks) than the average of the past 6 seasons (average of 47 outbreaks). Of note, the mechanism by which county health department (CHD) staff documented influenza and ILI outbreaks was updated for the 2016-17 influenza season in an effort to have more timely, structured, and complete data available to state-level staff. To support this

Figure 7: Outbreaks by Influenza Season and Predominately Circulating Strain, 2010-11 to 2016-17, Florida

process change, additional trainings for CHD staff were conducted, which may have improved documentation of outbreaks for the 2016-17 season. Other efforts to improve reporting, such as sending letters to long-term care facilities, may have also contributed to the increase. Other states also reported increased number of outbreaks, so it is likely that a true increase in disease also contributed to the larger number of outbreaks documented.

Consistent with the statewide peak in influenza activity, the largest number of outbreaks (53) were reported in February (Figure 8). While H3 seasons are typically harder on the elderly, in the 2016-17 season, a larger proportion of outbreaks were reported in facilities serving adults aged ≥65 years old compared to the previous three-season (H3) average, suggesting adults in this age group were hit harder during the 2016-17 season than in past influenza A (H3)-dominant seasons (Figure 9).

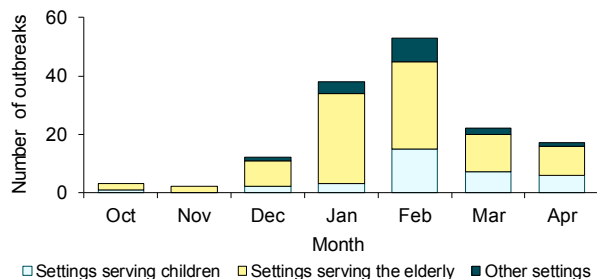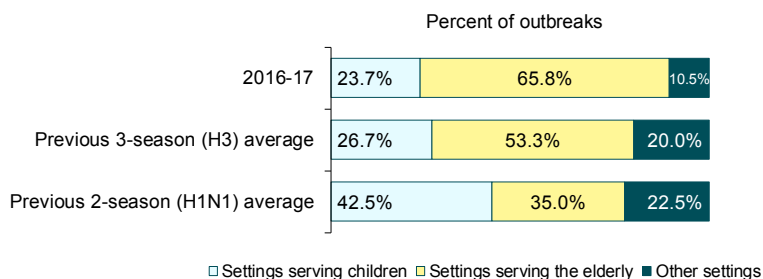Figure 8: Outbreaks by Setting Type* and Month, 2016-17 Season, Florida

Figure 9: Outbreaks by Setting Type* and Season, 2016-17 Season, 3-Season (H3) Average (2011-12, 2012-13, 2014-15), and 2-Season (H1N1) Average (2013-14, 2015-16), Florida

☐ Settings serving children ☐ Settings serving the elderly ■ Other settings

* 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

Although not individually reportable, pneumonia and influenza deaths in people of all ages are monitored through review of death certificate data. Estimating the total number of deaths due to seasonal influenza is challenging, as influenza may lead to death from other causes, such as pneumonia, congestive heart failure, or chronic obstructive pulmonary disease. It has been recognized for many years that influenza is underreported on death certificates and patients are not always tested for seasonal influenza infection, particularly the elderly who are at greatest risk of seasonal influenza complications and death. Some deaths, particularly among the elderly, are associated with secondary complications of seasonal influenza (including bacterial pneumonias). While death certificate data will likely undercount the true number of deaths attributed to influenza, utilization of the data can provide insight into the overall trends and information about the severity of different strains of influenza circulating each season. The 2016-17 influenza season was consistent with previous H3 seasons, which are associated with higher mortality in the elderly (Figure 10).

Figure 10: Percentage of All Deaths Attributed to Pneumonia and Influenza (P&I) by Age Group, 2-Season (H1N1) Average (2013-14, 2015-16), 3-Season (H3) Average (2011-12, 2012-13, 2014-15), and 2016-17 Season, Florida
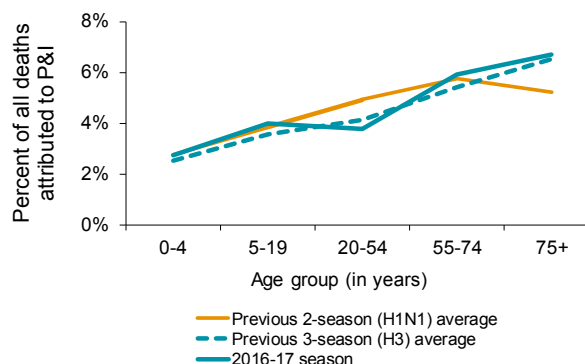
Influenza-associated pediatric deaths are reportable in Florida; typically, two to eight deaths are reported each year. Ten deaths were reported in children in the 2016-17 season; two additional deaths were reported in June and September. Of the ten children who died, none had received the seasonal influenza vaccination and five had underlying health conditions. Specimens from children who die frequently go untyped, and given the small number of deaths each year, it is difficult to interpret how pediatric mortality is affected by strain. For additional information about influenza-associated pediatric mortality reported in 2016, please see Section 3: Narratives for Selected Reportable Diseases/Conditions of Infrequent Occurrence.

References

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