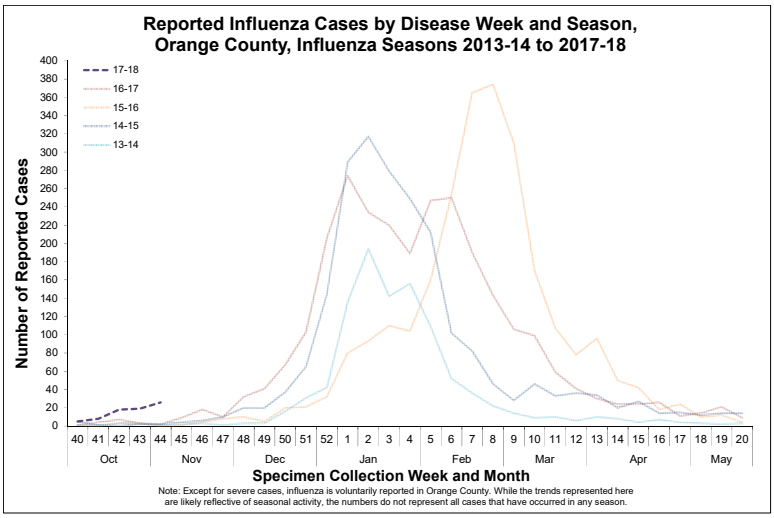
Eye on Influenza

Updates on Influenza in Orange County

November 2017 Volume 1

Orange County has reported its first influenza-associated death of the season in a person less than 65 years of age. The decedent was a previously healthy toddler who was not vaccinated this season. All persons 6 months of age and older are recommended to get influenza vaccine annually. Influenza vaccine is readily available at numerous locations throughout the county; see www.ochealthinfo.com/phs/about/family/flu for more information.

Current Situation: Since week 41 (ending 10/14/2017), influenza activity in Orange County has been elevated earlier this season compared to the past four years. Influenza A/H3 has been the most frequently identified influenza virus by Orange County Public Health Laboratory thus far in the season. Very few detections of influenza A/(H1N1)pdm2009 and influenza B have been reported.



Influenza Testing: Rapid influenza diagnostic tests (RIDTs) utilizing antigen detection are generally only 50-70% sensitive and should not be relied on for diagnosis of influenza or for clinical management and treatment decisions. Reverse transcription-polymerase chain reaction (RT-PCR) and other molecular assays have high sensitivity and specificity and are the preferred testing modality for hospitalized patients and other patients for whom influenza testing results would influence clinical management. Respiratory specimens should be collected as close to illness onset as possible (ideally within the first 3-4 days) to maximize virus detection. The CDC has developed an algorithm to assist providers with deciding when to consider influenza testing (www.cdc.gov/flu/professionals/diagnosis/consider-influenza-testing.htm) and how to interpret influenza test results (www.cdc.gov/flu/professionals/diagnosis/algorithm-results-circulating.htm). **Empiric therapy for suspected influenza should not be delayed while awaiting testing results in hospitalized patients or those at high risk for complications of influenza.**

Influenza Treatment: Antiviral treatment with neuraminidase inhibitors (e.g., oseltamivir, zanamivir, or peramivir) should be started as soon as possible in the following patients:

- **Hospitalized patients with suspected or confirmed influenza**
- **Patients with progressive disease**
- **Patients who are at high risk for influenza complications.[1]**

Dosing information is available at www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm. Although antiviral treatment is of the most benefit when started within 48 hours of symptom onset, patients hospitalized later in illness may still benefit. History of current season vaccination does not exclude an influenza diagnosis.

Influenza Vaccination: See the latest Advisory Committee on Immunization Practices (ACIP) recommendations in the 8/25/17 *MMWR Recommendations and Reports* available at www.cdc.gov/mmwr.

[1] See www.cdc.gov/flu/professionals/antivirals/antiviral-use-influenza.htm for list of high risk conditions.

Eye on Influenza

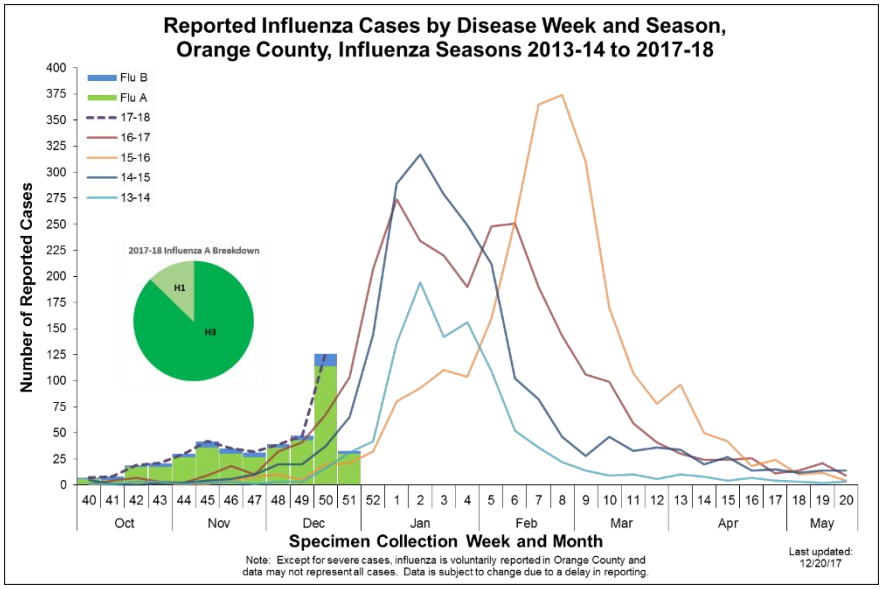
Updates on Influenza in Orange County

Flu is NOT the Gift to Give: Vaccinate & Get Vaccinated!

December 2017 Volume 2

Influenza activity is increasing! Orange County has had an increase in influenza reports in the past week and we are hearing about increases in activity nationally. Vaccination is recommended for all persons 6 months of age and older as it can prevent serious illness, medical visits and hospitalizations. Influenza vaccine is readily available at numerous locations throughout the county; see www.ochealthinfo.com/phs/about/family/flu.

Current Situation: An increase in influenza activity has been seen in Orange County since week 50 (week ending 12/16), and influenza activity is now widespread in California.



Over 75% of influenza identified by the Orange County Public Health Laboratory (PHL) has been influenza A H3. Similarly, influenza A has been predominant nationally, comprising 78% of reports overall from participating U.S. clinical laboratories since October 1. Of the B isolates for which lineage has been identified, over 90% have been of the Yamagata lineage (in quadrivalent vaccines only) and less than 10% are B/Victoria (in trivalent and quadrivalent vaccines). No viruses resistant to the neuraminidase inhibitors (i.e., oseltamivir, zanamivir, peramivir) have been identified yet this season.

Severe influenza illnesses, including, hospitalizations and deaths, have been more common during previous seasons with H3N2 predominance.

Match to vaccine and vaccine effectiveness. Antigenic and genetic characterization suggest that the circulating viruses are similar to the reference strains in this season's vaccine. However, studies suggest that the circulating H3N2 are less similar to the egg-adapted viruses actually used in production of the majority of U.S. influenza vaccines, which could potentially contribute to vaccine effectiveness. The preliminary estimate of vaccine effectiveness against H3N2 was low (10%) in Australia's just-concluded influenza season, but the significance of these results for the U.S. season is uncertain. Vaccine effectiveness data is not yet available in this country. While effectiveness varies from year to year, the CDC estimates that influenza vaccination averted 40,000 deaths in the U.S. between 2005-2014. For more information: http://www.nejm.org/doi/full/10.1056/NEJMp1714916.

Worldwide seasonal influenza death estimates. The CDC and global health partners recently reported that between 291,000 and 646,000 people worldwide die from seasonal influenza-related respiratory illnesses each year, which is likely an underestimate since it does not include other conditions exacerbated by influenza which may be instead listed as the cause of death on the death certificate For more information: https://www.cdc.gov/media/releases/2017/p1213-flu-death-estimate.html.

For clinical guidance, see our last edition of *Eye on Influenza* or www.cdc.gov/flu/professionals.

Eye on Influenza

Updates on Influenza in Orange County

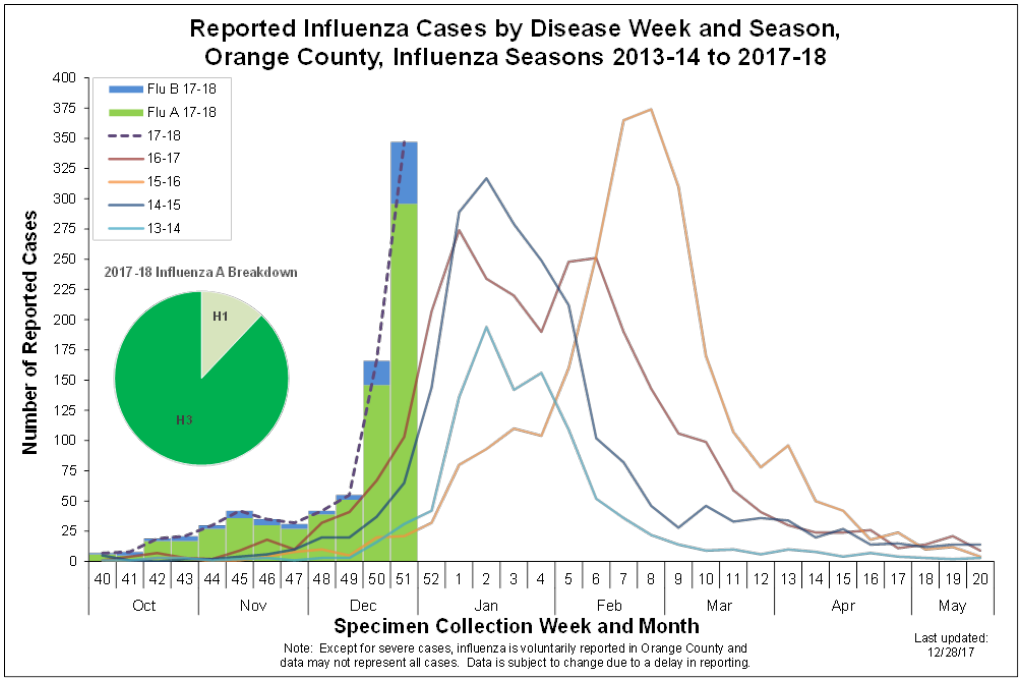
December 2017 Volume 3

Sharp Increase in Influenza Activity in Orange County

Orange County has received a large number of influenza reports in the past week, in conjunction with increases in activity nationally. Key points:

- **It's not too late to vaccinate! Influenza vaccine is readily available at numerous locations throughout the county; see www.ochealthinfo.com/phs/about/family/flu.**
- **Clinicians should review the latest guidance on influenza treatment [attached Health Advisory] from the Centers for Disease Control and Prevention (CDC).**
- **Outbreaks of influenza have been reported from skilled nursing facilities in the County. Staff at long-term care facilities should review the recommendations for prevention and control of influenza outbreaks summarized on the next page and attached.**

Current Situation: A large increase in the number of influenza reports was seen in week 51 (week ending 12/23) and the pace has not slowed so far this week. The majority of reports continue to be influenza A H3. Outpatient visits for influenza-like illness (ILI) at sentinel providers have also increased. Three severe cases of influenza (less than 65 years of age and hospitalized in intensive care or who died) have been reported thus far this season, with two deaths. Two of these severe cases (including one of the deaths) were children, both of whom were not vaccinated.



Prevention of Influenza: Everyone 6 months of age and older should get an influenza vaccine every season. Vaccination can reduce illnesses, doctors' visits, hospitalizations, and days of missed work and school due to influenza. Vaccination is especially important for people at high risk of complications of influenza. To find a flu shot, go to www.ochealthinfo.com/phs/about/family/flu or https://vaccinefinder.org. **In addition, there are everyday preventive actions you can take to stop the spread of germs**, including staying home while ill, covering your nose and mouth with a tissue when you cough or sneeze, and washing your hands with soap and water or using an alcohol-based hand rub.

Treatment of Influenza: In the past, influenza A H3N2-predominant seasons have been associated with more hospitalizations and deaths and vaccine effectiveness has been lower against the H3N2 viruses compared to H1N1 or B. **For this reason, the use of antiviral medications for treatment of influenza is very important this season, in addition to vaccination for prevention of influenza.** Clinicians are reminded to consider influenza in patients presenting with fever and/or respiratory illness, and treat all hospitalized or high risk patients with suspected influenza with a neuraminidase inhibitor (e.g., oseltamivir, zanamivir, or peramivir) as soon as possible. See the attached Health Advisory for more information.

OC health CARE AGENCY

Eye on Influenza

Updates on Influenza in Orange County

December 2017 Volume 3

Page 2 – Summary of Recommendations for Long Term Care Facilities (LTCF)

For detailed recommendations, see:

- CDC Interim Guidance for Influenza Outbreak Management in Long-Term Care Facilities: https://www.cdc.gov/flu/professionals/infectioncontrol/ltc-facility-guidance.htm)
- California Department of Public Health "Recommendations for the Prevention and Control of Influenza in California Long-Term Care Facilities": https://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/RecommendationsForThePreventionAndControlOfInfluenzaOct2016.pdf

Vaccination: All LTCF healthcare personnel (HCP) and residents should be vaccinated annually against influenza, or upon admission between August and April, if not already vaccinated.

Respiratory hygiene and cough etiquette: Post visual alerts, provide tissues or masks to those symptomatic, ensure hand hygiene supplies are available, and exclude ill visitors and HCP.

Definitions:

- A cluster of influenza-like illness (ILI) is two or more cases of ILI occurring within 72 hours.
- **An influenza outbreak is one case of laboratory-confirmed influenza** (or more) **in the setting of a cluster of ILI within a 72 hour period**.

Surveillance: Implement active daily surveillance for ILI among all residents and staff throughout influenza season. Instruct HCP to self-report any influenza-like symptoms to their supervisor. Exclude ill HCP from work until at least 24 hours after fever resolves, without the use of fever-reducing medications.

Testing: For cases of acute respiratory illness suggestive of influenza, the following influenza tests are recommended, in order of priority, if readily available: 1) real-time reverse-transcriptase (RT-PCR), 2) immunofluorescence, or 3) rapid influenza antigen tests. If immunofluorescence or antigen results are negative and influenza is suspected, specimens should be sent for confirmation by RT-PCR or viral culture. Real-time RT-PCR is the best way to confirm the diagnosis of influenza quickly.

Antiviral Treatment: Start antiviral therapy as soon as possible for all LTCF residents with suspected or confirmed influenza, even before results are available. For antiviral drugs and dosages, see https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm#dosage.

Antiviral Prophylaxis: Start antiviral chemoprophylaxis on **all** non-ill residents, regardless of influenza vaccination status, as soon as an influenza outbreak (as defined above) is determined. Antiviral chemoprophylaxis should continue for a minimum of two weeks and for at least 7-10 days after the last known case is identified, whichever is longer. Priority should be given to residents living in the same unit or floor as an ill resident, but all non-ill residents are recommended to receive the prophylaxis.

Infection Control Precautions: Implement Standard and Droplet Precautions for all residents with suspected or confirmed influenza for 7 days after illness onset or until 24 hours after the resolution of fever and respiratory symptoms, whichever is longer.

Report all suspected and confirmed outbreaks to Orange County Public Health Epidemiology at 714-834-8180.

Eye on Influenza

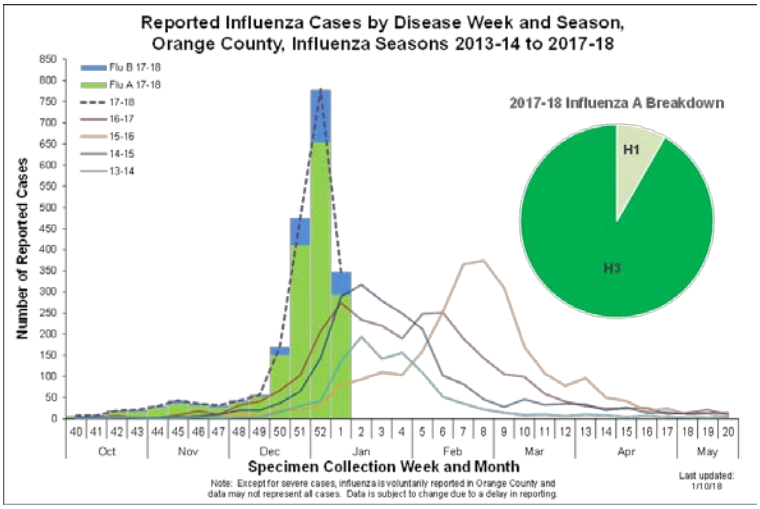
Updates on Influenza in Orange County

Influenza Activity Continues at High Levels in Orange County

January 12, 2018 Volume 4

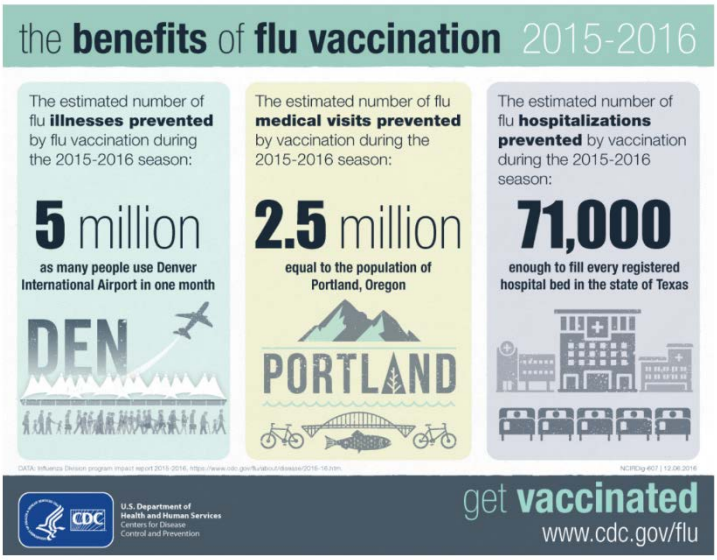
Orange County continues to receive large numbers of influenza reports, outbreaks in long term care facilities and other group settings, and severe cases (less than 65 years of age hospitalized in intensive care or who died). Key points:

- **It's not too late to vaccinate!** Influenza vaccine is readily available at numerous locations throughout the county; see www.ochealthinfo.com/phs/about/family/flu**.**
- **Antivirals should be started as soon as possible** in people with symptoms of influenza who are hospitalized, have severe progressive disease, or who are at increased risk of complications of influenza.
  - Per the California Department of Public Health (CDPH), there is currently no state or national shortage of antivirals, though multiple local pharmacies have reported delays in supply from wholesalers. CDPH recommends that pharmacies having difficulties locating antivirals in a timely manner should consider contacting their wholesaler's customer service desk to request drop shipments from the manufacturer. For updates on antiviral supply and manufacturer availability: www.cdc.gov/flu/antivirals/supply.htm.
  - For clinical antiviral recommendations see: https://emergency.cdc.gov/han/han00409.asp.
- **Patients with influenza should be cared for using droplet precautions in healthcare settings, including hospitals and long-term care facilities.** The CDC recommends that "patients under droplet precautions should be discharged from medical care when clinically appropriate, not based on the period of potential virus shedding or the recommended duration of droplet precautions. Before discharge, communicate the patient's diagnosis and current precautions with post-hospital care providers (e.g., home-healthcare agencies, long-term care facilities) as well as transporting personnel." (See All Facilities Letter AFL 18-08 and CDC's Prevention Strategies for Seasonal Influenza in Healthcare Settings.)



Current Situation: Influenza reports, predominantly A H3, continued to increase in Orange County through week 52 (week ending 12/30), but may be showing signs of decreasing in the past week. The recent numbers of reports have been higher than any flu season in the past 5 years. Twenty-eight (28) severe cases, including 12 children and six deaths have been reported this season.

It's not too late to vaccinate. CDC reports that although influenza may be peaking currently, there are still many more weeks/months of flu season to go and other strains (e.g., H1N1 and B) are also likely to circulate. Even in years with lower effectiveness, vaccination prevents millions of illnesses and medical visits and thousands of hospitalizations from influenza. Patients are more likely to be vaccinated if their health care provider both recommends and offers influenza vaccine during their medical visit.



OC health CARE AGENCY

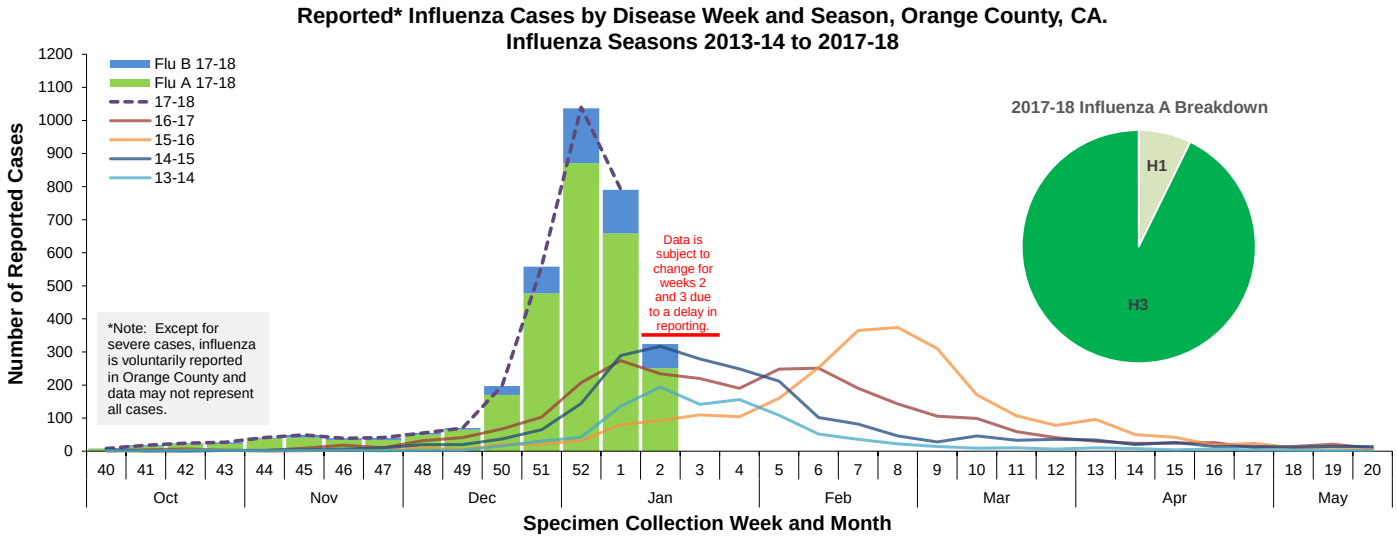
Eye on Influenza

Updates on Influenza in Orange County

January 19, 2018 Volume 5

Severe Cases of Influenza Continue to be Reported in Orange County

Current Situation: Although influenza activity has decreased in the past few weeks, overall activity in Orange County continues to be elevated and influenza strains are expected to circulate for several more weeks to months. To date, 35 severe cases of severe influenza (less than 65 years of age and hospitalized in intensive care or who died) have been reported in Orange County, with seven deaths. Influenza A/H3 continues to be the most frequently identified influenza virus by Orange County Public Health Laboratory so far in the season.



Take three actions to fight influenza:

1. Every year, people six months and older should get an influenza vaccine (shot). If you have not received the vaccine yet, now is the time to get it – it is not too late.
2. Avoid close contact with sick people, and if you are sick with flu, stay home for at least 24 hours after your fever is gone (without fever-reducing medications), except to get medical care. Frequently wash your hands with soap and warm water.
3. If you get the flu, antiviral drugs can be used to treat illness. For people with high-risk factors (kids under 5 years, adults over 65 years, pregnant women, people with chronic medical conditions, and residents of long-term care facilities), treatment with an antiviral drug can mean the difference between having a milder illness versus a very serious illness that could result in a hospital stay.

Access to antiviral medications to treat influenza: There is no statewide or national shortage of antivirals. See www.cdc.gov/flu/antivirals/supply for more information. **For patients in the Medi-Cal program:** California Department of Health Care Services (DHCS) encourages Medi-Cal Managed Care Plans to review current policies regarding access to antiviral medications for influenza and investigate ways to reduce treatment barriers. DHCS also reminds all Fee-for-Service Medi-Cal providers that all brands of the recommended antiviral drugs to treat influenza, including oseltamivir, do not require prior authorization and may be billed directly without a Treatment Authorization Request. For more information, please visit: http://files.medi-cal.ca.gov/pubsdoco/newsroom/newsroom_26620.asp

Eye on Influenza

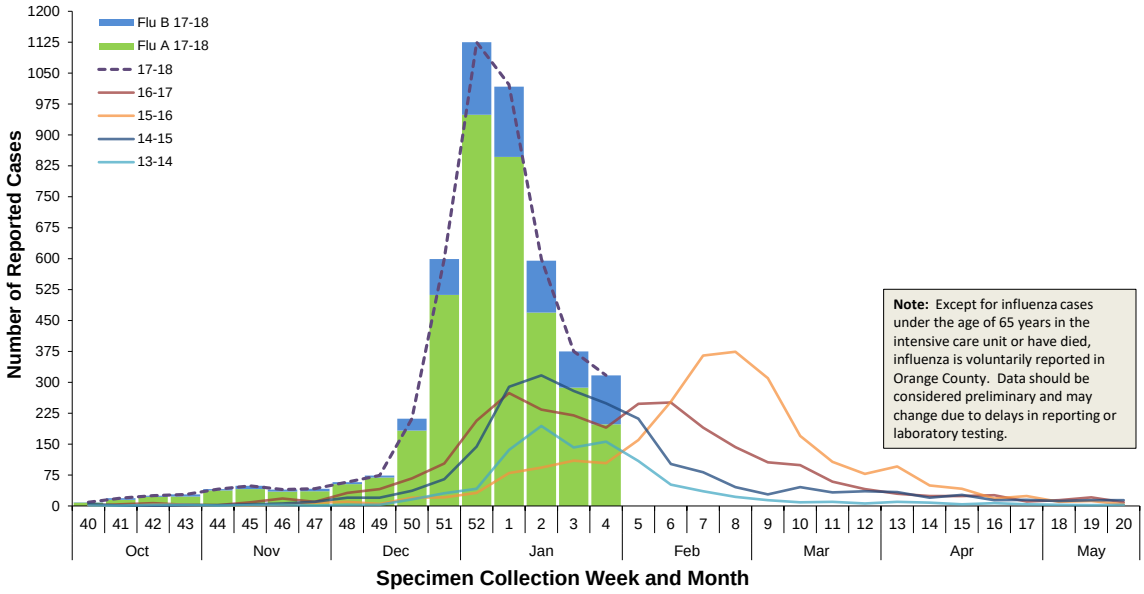
Updates on Influenza in Orange County

February 2, 2018 Volume 6

Influenza Viruses Continue to Circulate in Orange County

Current Situation: Although influenza viruses continue to circulate, overall activity has steadily decreased since week 1 (ending 1/6/2018). Influenza activity is likely to continue for months and Orange County residents are encouraged to be vaccinated if they still haven't received the 2017-18 vaccine. To date, 60 severe cases of influenza (less than 65 years of age and hospitalized in intensive care or who died) have been reported in Orange County; eleven of the sixty severe cases were reported as influenza-associated deaths. Influenza A/H3 continues to be the most frequently identified influenza virus in specimens tested by Orange County Public Health Laboratory.

Reported Influenza Cases by Disease Week and Season, Orange County, Influenza Seasons 2013-14 to 2017-18



Can influenza viruses be transmitted by just breathing? A study recently published in the *Proceedings of the National Academy of Sciences* suggests it may be easier to spread influenza viruses than previously thought. Researchers found that influenza virus can be aerosolized by ill cases during natural breathing, without coughing or sneezing. These findings highlight the importance of staying home and out of public places (i.e. work, school) to prevent influenza's spread.

Link: http://www.pnas.org/content/early/2018/01/17/1716561115

Acute myocardial infarction following lab-confirmed influenza infection: A new study published in the *New England Journal of Medicine* examined the potential risk of a heart attack following influenza infection. Patients with influenza were six times more likely to have a heart attack in the first 7 days after virus detection when compared to the year before having influenza or the rest of the year after. The risk was highest in the elderly (≥65 years of age) and for patients with influenza B.

Link: http://www.nejm.org/doi/full/10.1056/NEJMoa1702090

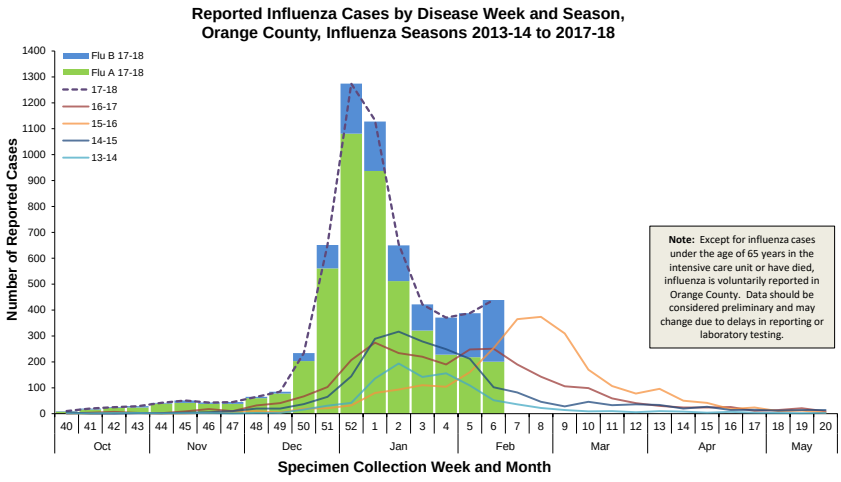
Eye on Influenza

Updates on Influenza in Orange County

February 20, 2018 Volume 7

Influenza Activity Expected to Continue for Several More Weeks; It's Not Too Late to Vaccinate!

Current Situation: Influenza activity significantly decreased from week 1 through week 4; however, a slight increase in activity was observed over the past two weeks. Influenza activity is expected to continue through May and Orange County residents are encouraged to be vaccinated if they still haven't received the 2017-18 vaccine. To date, 74 severe cases of influenza (less than 65 years of age and hospitalized in intensive care or who died) have been reported in Orange County; 12 of the 74 severe cases were influenza-associated deaths. Influenza A(H3) overall has been the most frequently identified influenza virus but A(H1N1) and B strains have also been reported. **Of note, the proportion of influenza reports that are type B *(blue bar in graph)* has increased over the past few weeks.**



Secondary Bacterial Infections May Complicate Influenza

Influenza infection may be complicated by bacterial super-infection, most commonly with *Streptococcus pneumoniae, Haemophilus influenzae, Staphylococcus aureus* (including MRSA), or Group A Streptococcus (GAS, *S. pyogenes).* Of note, Orange County has had several severe GAS cases reported recently, complicating influenza-like illness (ILI) episodes in children. Others around the country have anecdotally reported similar events. **Clinicians taking care of patients with ILI should consider secondary bacterial infection, especially in patients who seem to be improving and then worsen, or in patients who are severely ill.**

Interim Estimates of 2017–18 Seasonal Influenza Vaccine Effectiveness: According to the CDC, overall vaccine effectiveness (VE) against medically-attended, laboratory confirmed illnesses from influenza was 36% thus far this season. VE was estimated to be 25% against illness caused by influenza A(H3) virus, 67% against A(H1N1)pdm09 viruses, and 42% against influenza B viruses. In addition, VE was higher (59%) among children aged 6 months to 8 years of age. Even with current vaccine effectiveness estimates, vaccination will prevent influenza illnesses, including thousands of hospitalizations and deaths.

Recommendations:

- Continue to vaccinate persons aged ≥ 6 months of age against influenza who have not yet been vaccinated this season. Children 6 months to 8 years of age who did not receive at least two doses of influenza vaccine prior to 7/1/2017 need two doses this season, spaced 28 days apart. Persons who have already been ill with influenza this season should still be vaccinated as there are several strains circulating.
- Start antiviral medications ASAP in patients with symptoms of influenza who are hospitalized, severely ill, or at increased risk for complications.

https://www.cdc.gov/mmwr/volumes/67/wr/mm6706a2.htm?s_cid=mm6706a2_e

Eye on Influenza

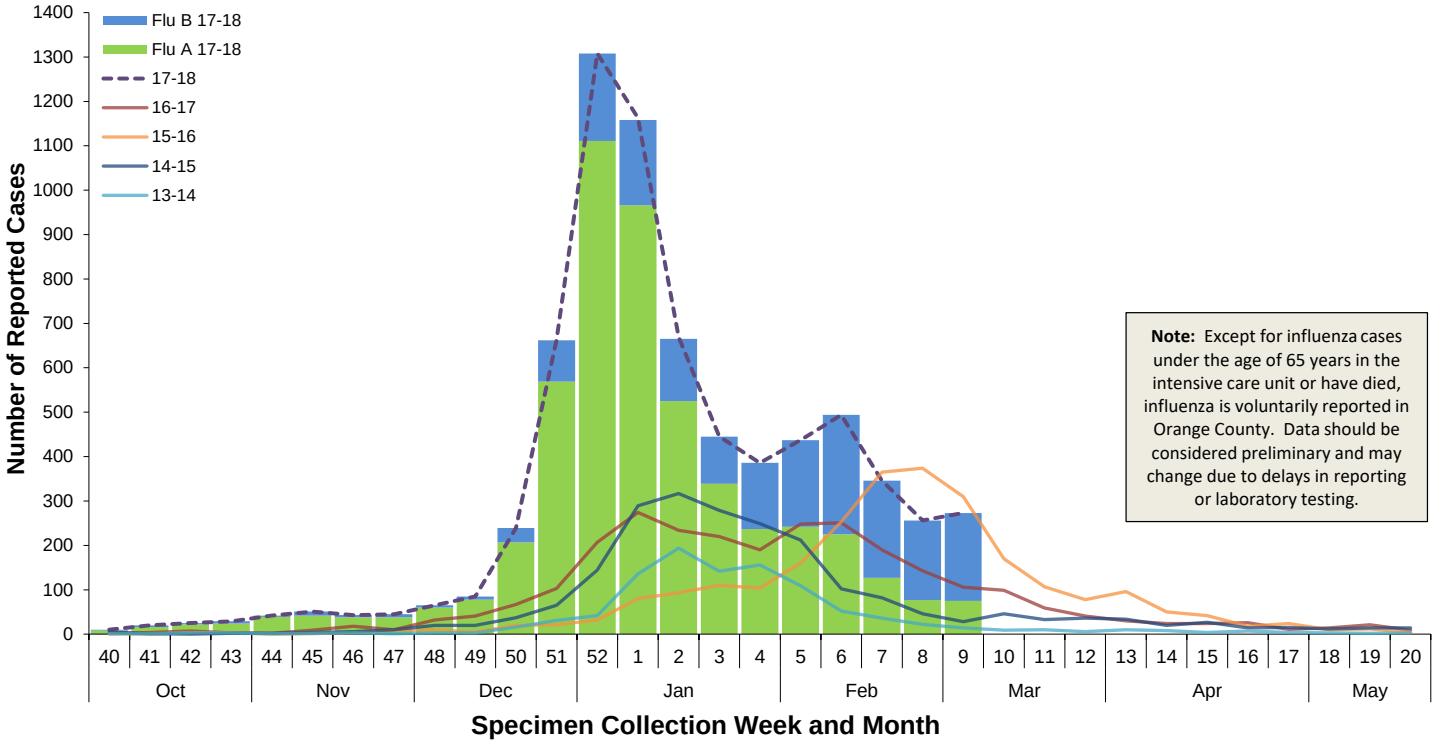
Updates on Influenza in Orange County

March 9, 2018 Volume 8

It's Still Not Too Late to Get Vaccinated!

Local Influenza Activity: Based on voluntary healthcare facility reporting, influenza appears to have peaked during week 52 (week ending 12/30/2017). But significant influenza B activity continues; a slight increase in overall influenza reports was seen between week 8 (ending 2/24/2018) and 9 (ending 3/3/2018). Influenza activity is expected to continue through May and Orange County residents are encouraged to be vaccinated if they still haven't received the 2017-18 vaccine. Influenza A(H3) overall has been the most frequently identified influenza virus but A(H1N1) and B strains have also been reported. Influenza B has for the past three weeks accounted for 60-70% of reported cases.

Reported Influenza Cases by Disease Week and Season, Orange County, Influenza Seasons 2013-14 to 2017-18



Severe Influenza Cases (<65 years of age and admitted to intensive care or died with influenza)	2017-2018 through 3/3/18	2016-2017 through week 9
Severe influenza cases (0-64 years of age)	85	28
Pediatric (0-18 years of age)	29	7
Deaths (0-64 years of age)	14	2
Pediatric (0-18 years of age)	1	0

Healthy children remain at risk for severe influenza-related complications: A study published by the Centers for Disease Control and Prevention (CDC) in the journal *Pediatrics* showed that half of pediatric flu-related deaths from 2010 to 2016 occurred in otherwise healthy children, of whom 69% were not vaccinated against influenza. Antiviral treatment was reported in only about half of the pediatric deaths. CDC recommends that flu antiviral drugs be started as soon as possible when people with high-risk conditions, including healthy young children, are suspected of having influenza. Of note, 43% of the pediatric deaths had at least one bacterial coinfection, of which beta-hemolytic *Streptococcus* (e.g., Group A Strep) and *Staphylococcus aureus* were the most common.
Link: http://pediatrics.aappublications.org/content/early/2018/02/09/peds.2017-2918.

Recommendations for 2018-19 Influenza Vaccine: The United States Food and Drug Administration's Vaccines and Related Biological Products Advisory Committee has chosen the influenza vaccine strains for the 2018-2019 season in the Northern Hemisphere:

- A/Michigan/45/2015 (H1N1)pdm09-like virus (*same as the 2017-2018 vaccine*)
- A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus (*new*)
- B/Colorado/06/2017-like virus (B/Victoria lineage) (*new*)
- B/Phuket/3073/2013-like virus (B/Yamagata lineage) (*same as in 2017-2018; in quadrivalent only*)

Earlier this year, the CDC Advisory Committee on Immunization Practices voted to restore the nasal live attenuated influenza vaccine (LAIV; FluMist) to the list of recommended influenza vaccines in the 2018-19 season, citing recent data in US children showing improved effectiveness against H1N1 than was seen with previous formulations in the past 2 years.

Promising results for new one-dose antiviral influenza drug: A new one-dose influenza antiviral called baloxavir marboxil (Xofluza) has been approved for use in Japan. Data from clinical trials in Japan and the United States demonstrated the antiviral shortened the duration of flu symptoms by about 1 day (to 53 hours) compared to placebo, and decreased duration of shedding to a median time of 24 hours, compared to 72 hours for oseltamivir (Tamiflu) and 96 hours for placebo. A clinical trial is still underway in the United States.

See *Open Forum Infect Dis* 2017 Falll: 4(Suppl 1) S734,
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5631501/.