Epidemiology Year-End Surveillance Report

Florida Department of Health in Orange County

December 2019

Contents:

County Program Contacts

Epidemiology
Ph: 407-858-1420
Fax: 407-858-5517

Hepatitis Program
Ph: 407-723-5054

Environmental Health
Ph: 407-858-1497

HIV/AIDS Surveillance
Ph: 407-858-1437

Tuberculosis
Ph: 407-858-1446
Fax: 407-245-0047

Sexually Transmitted Diseases
Ph: 407-665-3384
Fax: 407-845-6134

Healthy Start
Ph: 407-858-1472

The Epidemiology Program conducts surveillance and investigates, controls, and prevents occurrences of acute infectious diseases and outbreaks that are reported to the program.

Surveillance is conducted primarily through required reporting from health care providers, facilities, and clinical labs, and other required reporters pursuant to Chapter 381, Florida Statutes.

Data is collected and analyzed to track disease trends, and identify outbreaks and unusual occurrences for response and mitigation, and to identify targets for prevention and reduction efforts.

The Epidemiology Program conducts syndromic and influenza-like-illness surveillance activities through voluntary reporting from emergency departments and urgent care centers across Orange County. Syndromic surveillance is a method of determining activities in the community that could be early indicators of outbreaks and bioterrorism.

Health Advisories, News, & Alerts:

- **CDCHAN-00424: Outbreak of Pneumonia of Unknown Etiology (PUE) in Wuhan, China**
  - Please see the appended CDC HAN Alert and the CDC's situation summary of the investigation in Wuhan City, Hubei Provence, China regarding . Recommendations for health care providers are within the health advisory.
  - If you have any patients meeting all 3 criteria: presenting with respiratory symptoms, AND travel within 14 days of symptom onset to Wuhan, China, AND do not have another known diagnosis that would explain their illness, **please notify the resident's county health department immediately.**

- **CDCHAN-00425: Elevated Influenza Activity: Influenza B/Victoria and A(H1N1)pdm09 Viruses are the Predominant Viruses**

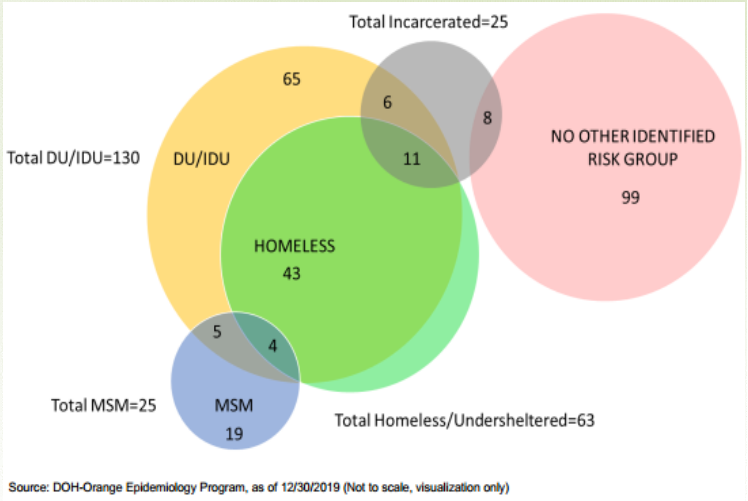
Hepatitis A in Orange County, FL

Total number of Hepatitis A vaccine given by DOH-Orange Epidemiology Program

Total 2019	5,625
Total 2018	1,907
Total 2017	26

Source: FL SHOTS

Intersection of Hepatitis A Outbreak Cases by High-Risk Group (2018-2019)



Source: DOH-Orange Epidemiology Program, as of 12/30/2019 (Not to scale, visualization only)

Central Florida Case Count

County	2018	2019 *YTD	TOTAL
Orange	93	196	289
Volusia	5	310	315
Marion	13	150	163
Lake	12	158	170
Brevard	3	168	171
Seminole	30	49	79
Polk	18	75	93
Osceola	4	55	59
TOTAL	**178**	**1161**	**1339**

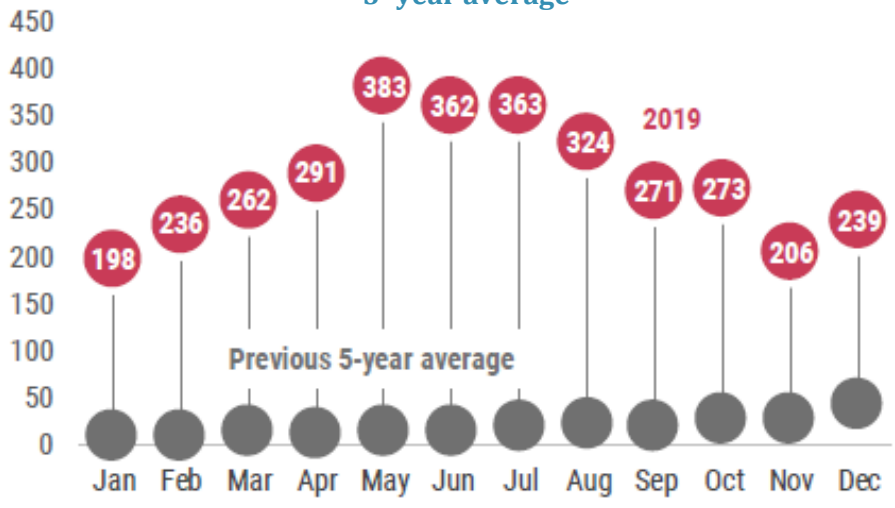
Source: Florida Merlin 12/30/2019, 10:02 AM

Hepatitis A Cases Statewide

2018-To-Date Key Points

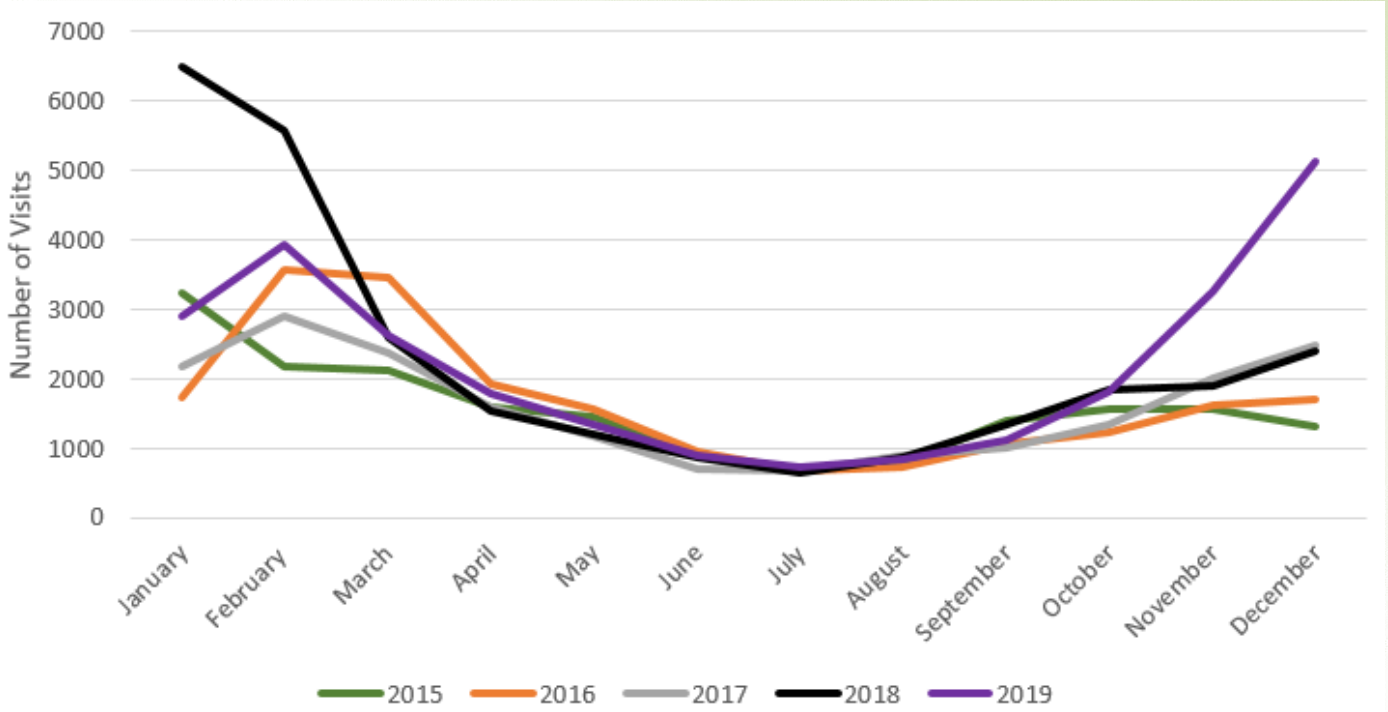
- 3,956 cases
- 24% cases linked to other cases
- 30–39 year olds had highest incidence
- 23% co-infected with hepatitis B or C

Monthly Trend of Reported Hepatitis A Cases in 2019 compared to a 5- year average

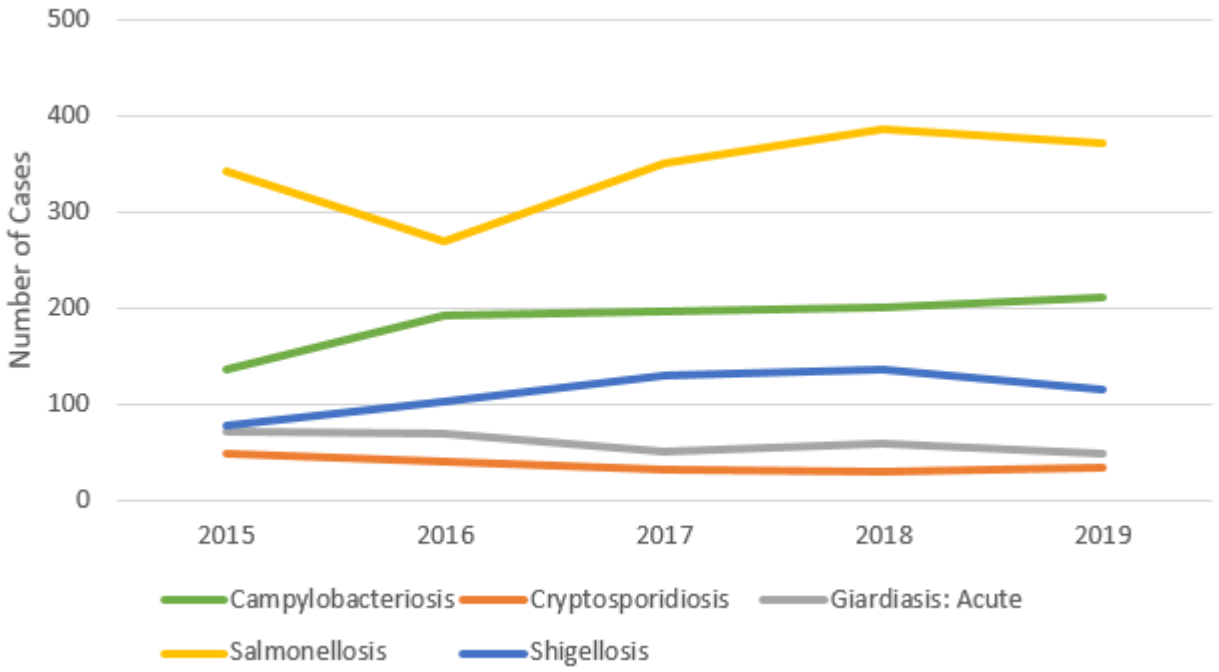


Source: FL Hepatitis A surveillance Report , December 2019

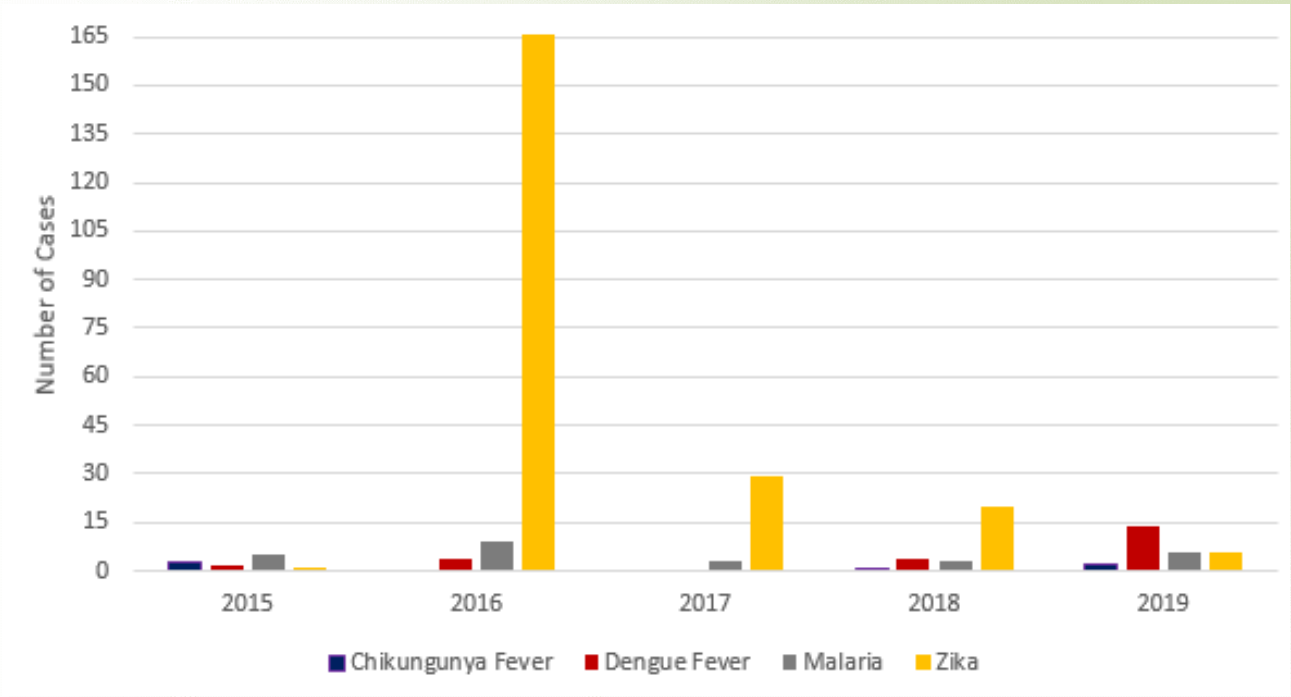
Emergency Department Visits due to Influenza-like Illness
Orange County, FL, 2015-2019



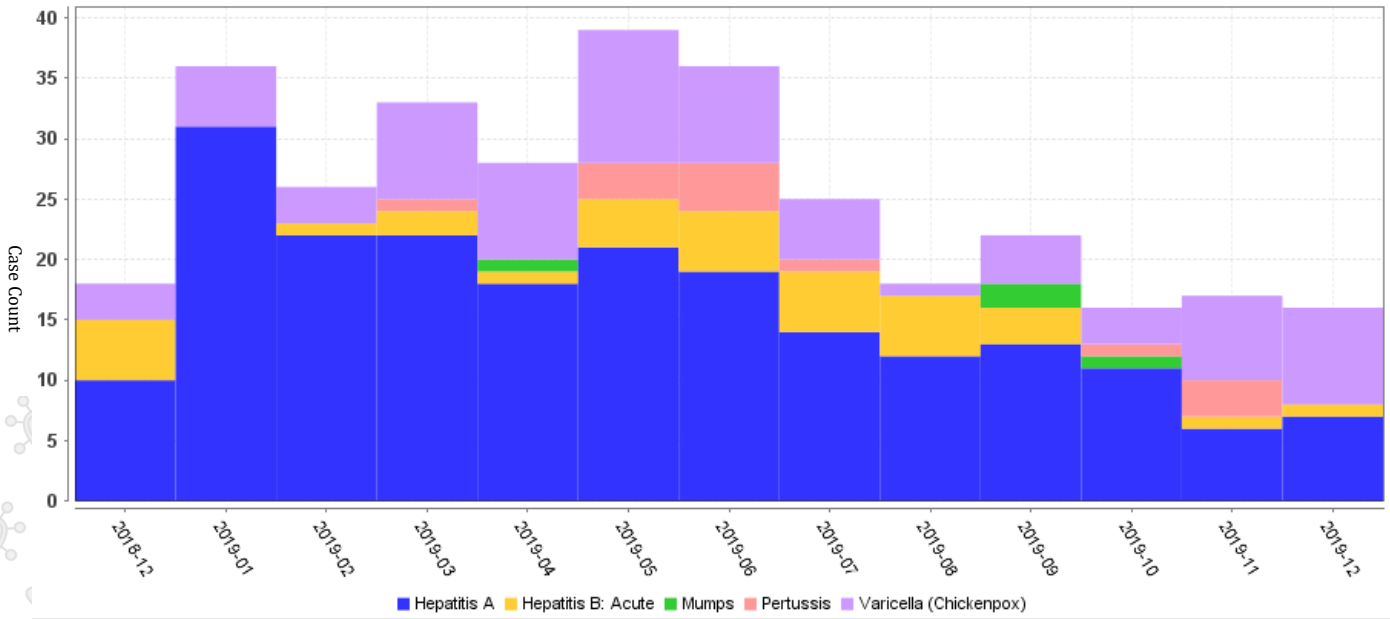
Select Reportable Gastrointestinal Diseases, Orange County, FL, 2015-2019



Arboviral Illnesses, Orange County, FL, 2015-2019



Orange County top 5 vaccine preventable disease cases by illness to include confirmed, probable and suspect cases, counted monthly, December 2018-2019



Outbreaks Reported to the Florida Department of Health in Orange County, FL 2019, by Illness and Count

ILLNESS	COUNT
Gastroenteritis	
Foodborne	1
Person to Person	11
Animal to Person	0
Unknown	1
Respiratory	
Waterborne	3
Person to Person	26
Unknown	1
Rash	
Airborne	0
Person to Person	7
Other	
Unknown	2
TOTAL	52

2019 Cumulative Reportable Disease Table (1 of 2)

Disease	Orange		All Counties	
	2019	Median (2014 - 2018)	2019	Median (2014 - 2018)
Anaplasmosis - HGA (Anaplasma phagocytophilum)	1	0	22	10
Arsenic Poisoning	0	0	13	14
Botulism: Foodborne	0	0	1	0
Brucellosis	1	0	8	10
California Serogroup Virus	0	0	0	1
Campylobacteriosis	232	196	4682	3713
Carbon Monoxide Poisoning	37	13	224	271
Chikungunya Fever	3	1	15	10
Cholera (Vibrio cholerae Type O1)	0	0	0	1
Ciguatera Fish Poisoning	1	2	75	58
Creutzfeldt-Jakob Disease (CJD)	2	1	33	29
Cryptosporidiosis	39	40	690	603
Cyclosporiasis	16	3	552	37
Dengue Fever	19	4	461	85
Eastern Equine Encephalitis	0	0	0	1
Ehrlichiosis (Ehrlichia ewingii)	0	0	1	0
Ehrlichiosis - HME (Ehrlichia chaffeensis)	0	1	38	28
Ehrlichiosis/Anaplasmosis: Undetermined	0	0	1	1
Escherichia coli: Shiga Toxin-Producing (STEC) Infection	77	29	841	619
Flavivirus Disease and Infection	0	0	2	2
Giardiasis: Acute	55	61	1111	1118
Haemophilus Influenzae (invasive disease)	19	18	398	301
Hansen's Disease (Leprosy)	0	1	27	19
Hemolytic Uremic Syndrome (HUS)	0	1	4	8
Hepatitis A	207	8	3498	137
Hepatitis B: Acute	29	30	875	733
Hepatitis B: Chronic	363	446	5090	4971
Hepatitis B: Perinatal	0	0	1	1
Hepatitis B: Surface Antigen in Pregnant Women	60	48	420	468
Hepatitis C: Acute	37	9	1051	364
Hepatitis C: Chronic	1582	1424	20934	25837
Hepatitis C: Perinatal	0	0	26	22
Hepatitis D	0	0	3	1
Hepatitis E	0	0	7	6
Herpes B Virus: Possible Exposure	0	0	11	8
Influenza-Associated Pediatric Mortality	1	1	8	6
Lead Poisoning	91	61	1911	1135
Legionellosis	47	31	804	412
Leptospirosis	3	0	8	4
Listeriosis	3	3	52	51
Lyme Disease	6	5	216	210

2019 Cumulative Reportable Disease Table (2 of 2)

Disease	Orange		All Counties	
	2019	Median (2014 - 2018)	2019	Median (2014 - 2018)
Measles (Rubeola)	1	0	5	5
Meningitis (bacterial cryptococcal mycotic)	0	1	105	116
Meningococcal Disease	1	2	23	23
Mercury Poisoning	0	0	17	28
Mumps	5	2	203	29
Neurotoxic Shellfish Poisoning	0	0	1	0
Paratyphoid Fever (Salmonella Serotypes Paratyphi A B C)	3	0	26	5
Pertussis	14	26	399	345
Pesticide-Related Illness and Injury: Acute	1	0	34	52
Psittacosis (Ornithosis)	0	0	1	0
Q Fever: Acute (Coxiella burnetii)	2	0	3	2
Q Fever: Chronic (Coxiella burnetii)	0	0	1	0
Rabies: Possible Exposure	97	83	4476	3400
Ricin Toxin Poisoning	0	0	2	1
Rocky Mountain Spotted Fever and Spotted Fever Rickettsiosis	3	0	51	28
Rubella	0	0	0	1
Salmonellosis	395	347	7364	6481
Scombroid Poisoning	2	0	57	0
Severe Vaping-Associated Pulmonary Illness (VAPI)	10	0	118	0
Shigellosis	134	131	1462	1548
Staphylococcus aureus Infection: Intermediate Resistance to Vancomycin (VISA)	0	0	0	4
Streptococcus pneumoniae Invasive Disease	44	46	953	644
Tetanus	0	0	4	2
Tularemia (Francisella tularensis)	0	0	0	1
Typhoid Fever (Salmonella Serotype Typhi)	19	1	165	16
Varicella (Chickenpox)	87	20	1041	752
Vibriosis (Grimontia hollisae)	0	0	3	2
Vibriosis (Other Vibrio Species)	1	0	90	23
Vibriosis (Vibrio alginolyticus)	2	3	70	69
Vibriosis (Vibrio cholerae Type Non-O1)	1	0	17	11
Vibriosis (Vibrio fluvialis)	1	0	17	12
Vibriosis (Vibrio mimicus)	0	0	4	4
Vibriosis (Vibrio parahaemolyticus)	2	1	50	48
Vibriosis (Vibrio vulnificus)	0	1	32	48
West Nile Virus Disease	0	0	4	12
West Nile Virus Non-Neuroinvasive Disease	0	0	3	4
Zika Virus Disease and Infection- Congenital	0	0	2	3
Zika Virus Disease and Infection- Non-Congenital	6	25	97	203
Total	3771	3132	61089	55297

Florida Department of Health in Orange County

Epidemiology Program
6101 Lake Ellenor Drive
Orlando, Florida 32809

Phone: 407-858-1420
Fax: 407-858-5517
http://orange.floridahealth.gov/

Sign up for Electronic Health Alerts & Epidemiology Monthly Surveillance Reports

Email Contact Information to:

CHD48.EPIRegistration@flhealth.gov

Follow the FL Department of Health in Orange County on **Twitter** @GOHealthyOrange!

Issue Contributors:

Taylor Langston, MPH
Epidemiologist

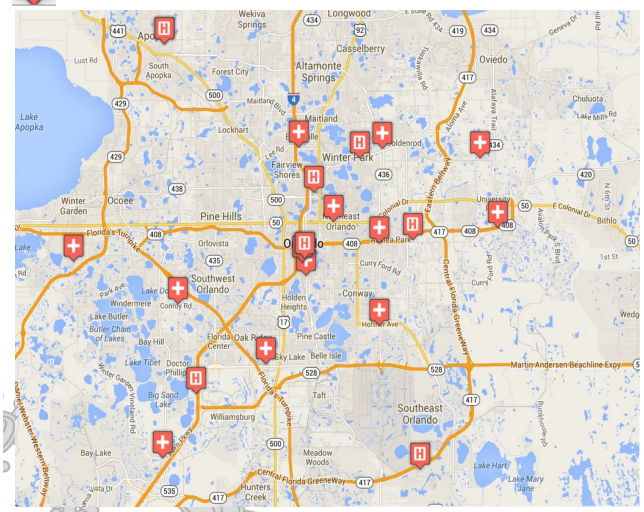
Michelle Persaud, MPH
Epidemiologist

Editor:

Ellis Perez, MPH
Epidemiology Program Manager

Hospital linked to ESSENCE

AdventHealth Centra Care Clinic linked to ESSENCE



Florida Department of Health: ESSENCE

Since 2007, the Florida Department of Health has operated the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE-FL), a state-wide electronic bio-surveillance system. The initial scope of ESSENCE was to aid in rapidly detecting adverse health events in the community based on Emergency Department (ED) chief complaints. In the following years, ESSENCE capabilities have continually evolved to currently allow for rapid data analysis, mapping, and visualization across several data sources, including ED record data, Merlin reportable disease data, Florida Poison Information Network consultations, and Florida Office of Vital Statistics death records. The majority of the information presented in this report comes via ESSENCE. Florida currently has 228 emergency departments and 35 urgent care centers reporting to ESSENCE-FL for a total of 263 facilities.

This is an official

CDC HEALTH ADVISORY

Distributed via the CDC Health Alert Network
January 8, 2020, 1615 ET (04:15 PM ET)
CDCHAN-00424

Outbreak of Pneumonia of Unknown Etiology (PUE) in Wuhan, China

Summary
The Centers for Disease Control and Prevention (CDC) is closely monitoring a reported cluster of pneumonia of unknown etiology (PUE) with possible epidemiologic links to a large wholesale fish and live animal market in Wuhan City, Hubei Province, China. An outbreak investigation by local officials is ongoing in China; the World Health Organization (WHO) is the lead international public health agency. Currently, there are no known U.S. cases nor have cases been reported in countries other than China. CDC has established an Incident Management Structure to optimize domestic and international coordination if additional public health actions are required.

This HAN Advisory informs state and local health departments and health care providers about this outbreak and requests that health care providers ask patients with severe respiratory disease about travel history to Wuhan City. Wuhan City is a major transportation hub about 700 miles south of Beijing with a population of more than 11 million people.

Background
According to a report from the Wuhan Municipal Health Commission, as of January 5, 2020, the national authorities in China have reported 59 patients with PUE to WHO. The patients had symptom onset dates from December 12 through December 29, 2019. Patients involved in the cluster reportedly have had fever, dyspnea, and bilateral lung infiltrates on chest radiograph. Of the 59 cases, seven are critically ill, and the remaining patients are in stable condition. No deaths have been reported and no health care providers have been reported to be ill. The Wuhan Municipal Health Commission has not reported human-to-human transmission.

Reports indicate that some of the patients were vendors at the Wuhan South China Seafood City (South China Seafood Wholesale Market) where, in addition to seafood, chickens, bats, marmots, and other wild animals are sold, suggesting a possible zoonotic origin to the outbreak. The market has been closed for cleaning and disinfection. Local authorities have reported negative laboratory test results for seasonal influenza, avian influenza, adenovirus, severe acute respiratory syndrome-associated coronavirus (SARS-CoV), and Middle East respiratory syndrome coronavirus (MERS-CoV) among patients associated with this cluster. Additional laboratory testing is ongoing to determine the source of the outbreak. Health authorities are monitoring more than 150 contacts of patients for illness.

CDC has issued a level 1 travel notice (“practice usual precautions”) for this destination. (https://wwwnc.cdc.gov/travel/notices/watch/pneumonia-china). On January 5, 2020, WHO posted an update on this situation, including an early risk assessment, which is available at: https://www.who.int/csr/don/05-january-2020-pneumonia-of-unkown-cause-china/en/.

Recommendations for Health Care Providers

1. Providers should consider pneumonia related to the cluster for patients with severe respiratory symptoms who traveled to Wuhan since December 1, 2019 and had onset of illness within two weeks of returning, *and* who do not have another known diagnosis that would explain their illness. Providers should notify infection control personnel and local and state health departments immediately if any

patients meet these criteria. State health departments should notify CDC after identifying a case under investigation by calling CDC's Emergency Operations Center at (770) 488-7100.

2. Multiple respiratory tract specimens should be collected from persons with infections suspected to be associated with this cluster, including nasopharyngeal, nasal, and throat swabs. Patients with severe respiratory disease also should have lower respiratory tract specimens collected, if possible. Consider saving urine, stool, serum, and respiratory pathology specimens if available.
3. Although the etiology and transmissibility have yet to be determined, and to date, no human-to-human transmission has been reported and no health care providers have been reported ill, CDC currently recommends a cautious approach to symptomatic patients with a history of travel to Wuhan City. Such patients should be asked to wear a surgical mask as soon as they are identified and be evaluated in a private room with the door closed. Personnel entering the room to evaluate the patient should use contact precautions and wear an N95 disposable facepiece respirator. For patients admitted for inpatient care, contact and airborne isolation precautions, in addition to standard precautions, are recommended until further information becomes available. For additional information see: https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html.

This guidance will be updated as more information becomes available.

For More Information
1-800-CDC-INFO
https://www.cdc.gov/cdc-info/index.html
CDC's Emergency Operations Center: 770-488-7100

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.

Categories of Health Alert Network messages:

Health Alert	Requires immediate action or attention; highest level of importance
Health Advisory	May not require immediate action; provides important information for a specific incident or situation
Health Update	Unlikely to require immediate action; provides updated information regarding an incident or situation
HAN Info Service	Does not require immediate action; provides general public health information

##This message was distributed to state and local health officers, state and local epidemiologists, state and local laboratory directors, public information officers, HAN coordinators, and clinician organizations##

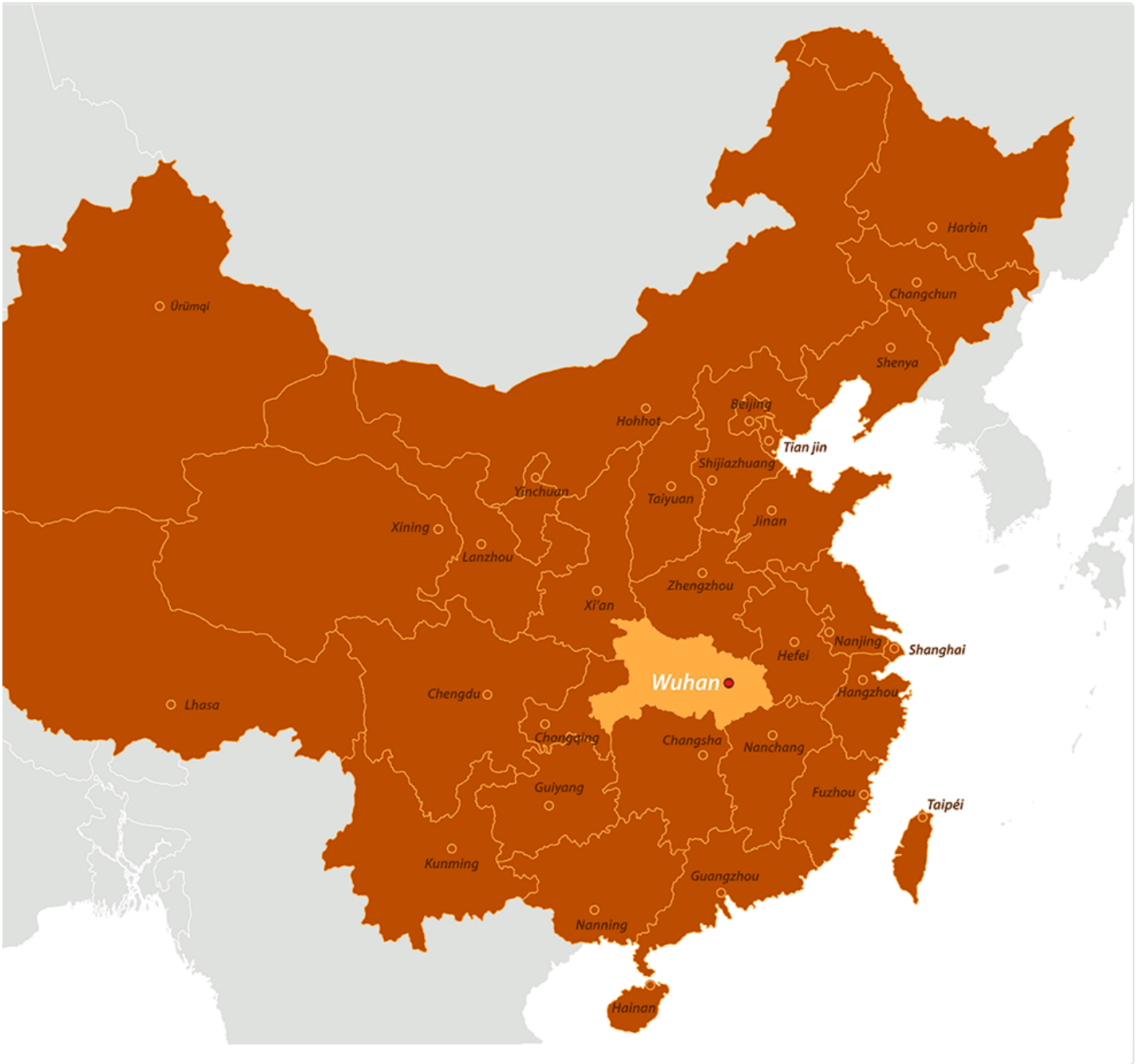
Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Coronavirus

Novel Coronavirus 2019 (nCoV-2019), Wuhan, China

Updated January 13, 2020

Situation Summary:



On January 11, 2020, Chinese health authorities preliminarily identified more than 40 human infections with a novel coronavirus in an outbreak of pneumonia under investigation in Wuhan City, Hubei Province, China. Chinese health authorities subsequently posted the full genome of the so-called "novel coronavirus 2019" or "nCoV-2019" in GenBank ®, the NIH genetic sequence database. Subsequently, on January 13, Thailand confirmed detection of a human infection with nCoV-2019 in a traveler from Wuhan City to Thailand.

Coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats and bats. Rarely, animal coronaviruses can evolve and infect people and then spread between people such as has been seen with MERS and SARS. The outbreak in Wuhan, China has been reported to be linked to a large seafood and animal market, suggesting a possible zoonotic origin to the outbreak.

There is an ongoing investigation to determine more about this outbreak. This is a rapidly evolving situation and information will be updated as it becomes available.

The World Health Organization (WHO) provided updated guidance specific to this response the evening of January 10, 2020. Clinicians should use WHO guidance until CDC guidance is updated in the coming days.

Risk Assessment:

Outbreaks of novel virus infections among people are always of public health concern. The associated risk posed by such outbreaks depends on characteristics of the virus, including whether and how well it spreads between people, the severity of resulting illness, and the medical or other countermeasures available to control the impact of the virus.

Chinese health authorities report that to date in this outbreak, most infections with novel coronavirus 2019 have had some exposure to one large seafood and animal market. They report no confirmed person-to-person spread of this virus. Authorities also report that several hundred contacts, including health care workers caring for outbreak patients, are being monitored and no additional illnesses have been detected. One patient in China is reported to have died. Seven patients have reportedly had severe illness.

There is no public information on the exact source of the infection of the patient in Thailand beyond travel from Wuhan.

There is much more to learn about the transmissibility, severity, and other features associated with this novel coronavirus, and investigations are ongoing. Based on current information, however, the risk from the novel coronavirus 2019 to the American public is deemed to be low at this time. Nevertheless, CDC is taking proactive preparedness precautions.

What to Expect

Access to the full genetic sequence of novel coronavirus 2019 will facilitate identification of infections with this virus going forward. It is possible that more cases will be identified in the coming days. This is an ongoing investigation and so far, there have been no confirmed reports of person-to-person spread with this virus, however, given what has occurred previously with MERS and SARS, some limited person-to-person spread would not be surprising.

CDC Response:

- CDC is closely monitoring this situation and is working with WHO.
- CDC has established an Incident Management Structure to optimize domestic and international coordination to this emerging public health threat.
- CDC has updated its interim travel health notice for this destination to provide information to people who may be traveling to Wuhan City and who may get sick.

- CDC has issued an interim Health Alert Notice (HAN) Advisory to inform state and local health departments and health care providers about this outbreak. An updated Health Alert Notice (HAN) is in development.
- CDC laboratories currently have the capacity to detect nCoV-2019 by sequencing the virus from clinical specimens and comparing the sequences against the genetic sequence posted in GenBank. CDC also is using the genetic sequence data provided by China to begin work on a test to detect this virus more easily. Currently, testing for this virus must take place at CDC.

This is an emerging, rapidly evolving situation and CDC will provide updated information as it becomes available, in addition to updated guidance in the coming days on how to investigate possible infections with this new coronavirus.

Other Available Resources

The following resources are available with current information on the unnamed novel coronavirus

- World Health Organization, Coronavirus
- CDC Information on Coronaviruses
  - CDC Travelers' Health: Pneumonia of Unknown Cause in China
  - CDC Health Alert Network Advisory information for state and local health departments and health care providers

Page last reviewed: January 13, 2020
Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Emergency Preparedness and Response

Elevated Influenza Activity: Influenza B/Victoria and A (H1N1)pdm09 Viruses are the Predominant Viruses

HAN HEALTH ALERT NETWORK

This is an official CDC HEALTH ADVISORY

Distributed via the CDC Health Alert Network
January 10, 2020, 1140 ET (11:40 AM ET)
CDCHAN-00425

The Centers for Disease Control and Prevention reminds clinicians that influenza B viruses can cause severe illness in people of all ages, including children. CDC continues to recommend influenza vaccination and prompt antiviral treatment of high-risk outpatients and hospitalized patients with suspected influenza.

Summary
This health advisory notifies clinicians that influenza activity remains high in the United States. Ongoing elevated activity is due to influenza B/Victoria viruses, increasing circulation of influenza A(H1N1)pdm09 viruses, and low levels of influenza B/Yamagata and influenza A(H3N2) viruses. CDC's influenza forecasts suggest that national influenza activity will remain elevated for several more weeks. Because influenza activity is elevated and both influenza A and B virus infections can cause severe disease and death, this health advisory also serves as a reminder that early treatment with antiviral medications improves outcomes in patients with influenza. Early treatment with antiviral medications is recommended for hospitalized patients and high-risk outpatients, including children younger than two years. Clinicians should continue efforts to vaccinate patients for as long as influenza viruses are circulating, and promptly start antiviral treatment of severely ill and high-risk patients with suspected influenza without waiting for laboratory confirmation.

Background
In the United States, influenza activity remains elevated and widespread, and the season is likely to last several more weeks (see CDC FluView report for details: https://www.cdc.gov/flu/weekly/index.htm). Since early this season, influenza B viruses, specifically B/Victoria viruses, have been reported more frequently than other influenza viruses, followed by A(H1N1)pdm09. Different viruses have predominated in different parts of the country and among different age groups. Influenza B viruses can cause severe illness in people of all ages, including children.[1] In past seasons, the proportion of influenza-related pediatric deaths associated with influenza B viruses has generally been higher than the proportion of influenza B among circulating viruses,[2,3] and pediatric mortality from influenza B–associated hospitalizations has been reported to be higher than with influenza A–associated hospitalizations.[4] So far this season, influenza B virus infections account for about half of hospitalizations reported through CDC's laboratory-confirmed influenza hospitalization surveillance network and the majority of reported influenza-associated pediatric deaths (https://www.cdc.gov/flu/weekly/index.htm). Influenza A(H1N1)pdm09 viruses are increasing and becoming predominant in some regions. These viruses can also cause severe illness, particularly in adults not originally exposed to currently circulating A(H1N1)pdm09 viruses.[5] Influenza A(H1N1)pdm09 viruses currently comprise the majority of the other half of hospitalizations reported through CDC's laboratory-confirmed influenza hospitalization surveillance network.

CDC continues to recommend everyone six months of age and older get vaccinated for influenza. CDC also recommends antiviral medications for the treatment of influenza, because antiviral treatment has shown clinical and public health benefit in reducing illness and lessening severe outcomes of influenza based on evidence from randomized controlled trials, meta-analyses of randomized controlled trials, and observational studies during past influenza seasons and during the 2009 H1N1 pandemic.[6-13] Influenza antiviral medications are most effective in treating influenza and reducing complications when treatment is started early (within 48 hours of illness onset). Some studies suggest clinical benefit among hospitalized patients and young children with febrile illness even when treatment was started three to five days after illness onset.[14-20]

Recommendations for Clinicians

1. **All People Six Months and Older Who Have Not Yet Received an Influenza Vaccine this Season Should Be Vaccinated Against Influenza**
   All available vaccine formulations this season contain A(H3N2), A(H1N1)pdm09, and B/Victoria virus strains.[21] The 2019-2020 U.S. quadrivalent influenza vaccines contain these and an additional influenza B/Yamagata virus. CDC does not recommend one influenza vaccine formulation over another.
2. **All Hospitalized, Severely Ill, and High-risk Patients with Suspected or Confirmed Influenza, Regardless of Influenza Vaccination Status, Should Be Treated with Antivirals As Soon As Possible After Onset of Illness**
   Antiviral treatment is recommended as early as possible for any patient with suspected or confirmed influenza who—
   1. Is hospitalized.
   2. Has severe, complicated, or progressive illness. This may include outpatients with severe or prolonged progressive symptoms or patients who develop complications such as pneumonia but who are not hospitalized.
   3. Is at high risk for influenza complications but not hospitalized. This includes—
      a. Children younger than two years. Although children younger than five years are considered at higher risk for complications from influenza, the highest risk is for those younger than two years.
      b. Adults 65 years and older.
      c. People with chronic pulmonary (including asthma), cardiovascular (except hypertension alone), renal, hepatic, hematological (including sickle cell disease), and metabolic (including diabetes mellitus) disorders.
      d. People with neurologic and neurodevelopment conditions, including disorders of the brain, spinal cord, peripheral nerve, and muscle, such as cerebral palsy, seizure disorder, stroke, intellectual disability, moderate to severe developmental delay, muscular dystrophy, or spinal cord injury.
      e. People with immunosuppression, including that caused by medications or by HIV infection.
      f. Women who are pregnant or postpartum (within two weeks after delivery).
      g. People younger than 19 years who are receiving long-term aspirin therapy.
      h. American Indians and Alaska Natives.
      i. People with extreme obesity (i.e., body mass index is equal to or greater than 40).
      j. Residents of nursing homes and other chronic care facilities.
3. **Antiviral Treatment in Non-High-Risk Patients with Uncomplicated Influenza**
   Antiviral treatment can benefit other individuals with influenza. While current guidance focuses on antiviral treatment of those with severe illness or at high risk of complications, antiviral treatment may be prescribed for any previously healthy (non-high risk) outpatient with suspected or confirmed influenza who presents within two days after illness onset. Multiple randomized controlled clinical trials (RCTs) and meta-analyses of RCTs have demonstrated efficacy of early initiation of treatment (started within 48 hours of illness onset) with neuraminidase inhibitors in reducing duration of fever and illness symptoms by about a day compared with placebo in otherwise healthy children and adults with uncomplicated influenza.[6,9] Clinical judgment—considering the patient's disease severity and progression, age, likelihood of influenza, and time since onset of symptoms is important when making antiviral treatment decisions for outpatients who are not at increased risk for influenza complications.
4. **Choice of Antiviral Medication**
   Four influenza antiviral medications approved by the U.S. Food and Drug Administration (FDA) are recommended for use in the United States during the 2019-2020 influenza season.

Three drugs are chemically related antiviral medications known as neuraminidase inhibitors: oral **oseltamivir phosphate** (available as a generic version or under the trade name Tamiflu®), inhaled **zanamivir** (trade name Relenza®), and intravenous **peramivir** (trade name Rapivab®). These medications block the viral neuraminidase enzyme and have activity against both influenza A and B viruses.

The fourth drug is oral **baloxavir marboxil** (trade name Xofluza®), which is active against both influenza A and B viruses but has a different mechanism of action. Baloxavir is a cap-dependent endonuclease inhibitor that interferes with viral RNA transcription and blocks virus replication. In October 2019, FDA approved an indication for baloxavir treatment of acute uncomplicated influenza within two days of illness onset in people 12 years and older at high risk of developing influenza-related complications, based upon the findings of a clinical trial.[22] In the clinical trial of early initiation of antiviral treatment for uncomplicated influenza in high-risk adolescents and adults, baloxavir was superior to placebo and had similar overall efficacy to oseltamivir in the time to alleviation of symptoms. There are no available data for baloxavir treatment of influenza in pregnant women, immunocompromised people, those with severe disease, or hospitalized patients.

Recommended ages for treatment and prevention with antiviral medications are summarized in the table below. Dosing and more detailed treatment considerations can be found in the Influenza Antiviral Medications: Summary for Clinicians (https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm)

Antiviral	Route	Treatment (Recommended Age)	Chemoprophylaxis (Recommended Age)	Most Common Adverse Events
Oseltamivir	oral and enteric	any age	≥3 months	nausea, vomiting, headache*
Zanamivir	inhaled	≥7 years	≥5 years	bronchospasm
Peramivir	intravenous	≥2 years	n/a	diarrhea
Baloxavir	oral	≥12 years	n/a	none more common than placebo

*Nausea and vomiting are generally transient and can be mitigated if oseltamivir is taken with food
n/a = not applicable

For outpatients with acute uncomplicated influenza, oral oseltamivir, inhaled zanamivir, intravenous peramivir, or oral baloxavir may be used for treatment.
The recommended treatment course for uncomplicated influenza is—

- One dose twice daily of oral oseltamivir for five days, or
- One dose twice daily of inhaled zanamivir for five days, or
- One dose of intravenous peramivir, or
- One dose of oral baloxavir.

Oral or enterically-administered oseltamivir is the only recommended antiviral medication for treating hospitalized patients with suspected or confirmed influenza and patients with severe or complicated illness with suspected or confirmed influenza (e.g., pneumonia, exacerbation of underlying chronic medical condition) who are not hospitalized. Please see the Influenza Antiviral Medications: Summary for Clinicians (https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm) for considerations regarding dosing and duration of antiviral treatment for patients with severe or complicated influenza. There are insufficient data for use of inhaled zanamivir, intravenous peramivir, and oral baloxavir in patients with severe influenza disease.

Oral oseltamivir is preferred for treatment of pregnant women. Oseltamivir has been shown to be safe for treating pregnant women, and pregnant women are recommended to receive the same antiviral dosing as non-pregnant people. Baloxavir is not recommended for treating women or breastfeeding mothers, as there are no available efficacy or safety data.

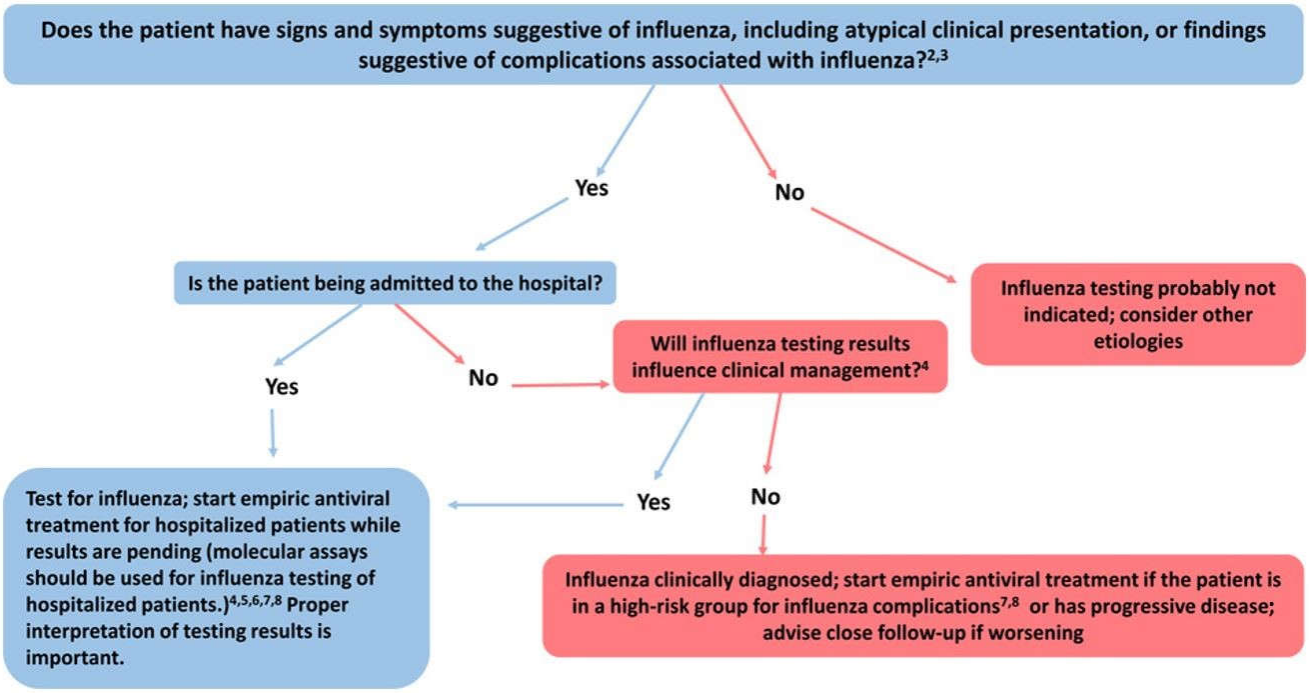
5. **Timing of Treatment and Implications for Patient Evaluation, Treatment, and Testing**

Clinical benefit is greatest when antiviral treatment is administered as close to illness onset as possible. Therefore, **antiviral treatment should be started as soon as possible and should not wait for laboratory confirmation of influenza**. Ideally, treatment should be initiated within 48 hours of onset of symptoms. However, antiviral treatment initiated later than 48 hours after illness onset can still be beneficial for some patients.

A history of current season influenza vaccination does not exclude a diagnosis of influenza in an ill child or adult. High-risk patients should be advised to call their healthcare provider promptly if they have symptoms of influenza.

Specimens from all hospitalized patients with suspected influenza should be tested with molecular assays with high sensitivity and specificity since influenza testing can help inform clinical management and prompt implementation of infection prevention and control measures for influenza. Molecular assays (including reverse transcription polymerase chain reaction [RT-PCR]) should be used for influenza testing of hospitalized patients. Treatment should be empiric and should start as soon as possible.[23,24] **Treatment should not wait for laboratory confirmation.**

The following figure may be used as a guide for considering influenza testing (see https://www.cdc.gov/flu/professionals/diagnosis/consider-influenza-testing.htm for footnotes)



Additional influenza resources for health professionals are available on the CDC website at https://www.cdc.gov/flu/professionals. In addition, www.vaccinefinder.org and www.medfinder.org, are available to help individuals find places to get age-appropriate influenza vaccines or fill prescriptions for influenza antivirals.

For More Information

- Weekly U.S. Influenza Surveillance Report, https://www.cdc.gov/flu/weekly/index.htm
- Information for Health Professionals, https://www.cdc.gov/flu/professionals
- Influenza Antiviral Medications: Summary for Clinicians, https://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm

- Guide for considering influenza testing when influenza viruses are circulating in the community, https://www.cdc.gov/flu/professionals/diagnosis/consider-influenza-testing.htm

References

1. Owusu D, Hand J, Tenforde MW, et al. Early Season Pediatric Influenza B/Victoria Virus Infections Associated with a Recently Emerged Virus Subclade — Louisiana, 2019 MMWR Morb Mortal Wkly Rep. ePub: 10 January 2020. DOI: http://dx.doi.org/10.15585/mmwr.mm6902e1
2. Doyle JD, Campbell AP. Pediatric influenza and illness severity: what is known and what questions remain? *Curr Opin Pediatr.* 2019;31(1):119-126.
3. Shang M, Blanton L, Brammer L, Olsen SJ, Fry AM. Influenza-Associated Pediatric Deaths in the United States, 2010-2016. *Pediatrics.* 2018;141(4).
4. Tran D, Vaudry W, Moore D, et al. Hospitalization for Influenza A Versus B. *Pediatrics.* 2016;138(3).
5. Budd AP, Beacham L, Smith CB, et al. Birth Cohort Effects in Influenza Surveillance Data: Evidence That First Influenza Infection Affects Later Influenza-Associated Illness. *The Journal of infectious diseases.* 2019;220(5):820-829.
6. Dobson J, Whitley RJ, Pocock S, Monto AS. Oseltamivir treatment for influenza in adults: a meta-analysis of randomised controlled trials. *Lancet.* 2015;385(9979):1729-1737.
7. Doll MK, Winters N, Boikos C, Kraicer-Melamed H, Gore G, Quach C. Safety and effectiveness of neuraminidase inhibitors for influenza treatment, prophylaxis, and outbreak control: a systematic review of systematic reviews and/or meta-analyses. *J Antimicrob Chemother.* 2017;72(11):2990-3007.
8. Hayden FG, Sugaya N, Hirotsu N, et al. Baloxavir Marboxil for Uncomplicated Influenza in Adults and Adolescents. *The New England journal of medicine.* 2018;379(10):913-923.
9. Malosh RE, Martin ET, Heikkinen T, Brooks WA, Whitley RJ, Monto AS. Efficacy and Safety of Oseltamivir in Children: Systematic Review and Individual Patient Data Meta-analysis of Randomized Controlled Trials. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2018;66(10):1492-1500.
10. Muthuri SG, Venkatesan S, Myles PR, et al. Effectiveness of neuraminidase inhibitors in reducing mortality in patients admitted to hospital with influenza A H1N1pdm09 virus infection: a meta-analysis of individual participant data. *Lancet Respir Med.* 2014;2(5):395-404.
11. Santesso N, Hsu J, Mustafa R, et al. Antivirals for influenza: a summary of a systematic review and meta-analysis of observational studies. *Influenza Other Respir Viruses.* 2013;7 Suppl 2:76-81.
12. Uyeki TM, Bernstein HH, Bradley JS, et al. Clinical Practice Guidelines by the Infectious Diseases Society of America: 2018 Update on Diagnosis, Treatment, Chemoprophylaxis, and Institutional Outbreak Management of Seasonal Influenzaa. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2019;68(6):895-902.
13. Venkatesan S, Myles PR, Leonardi-Bee J, et al. Impact of Outpatient Neuraminidase Inhibitor Treatment in Patients Infected With Influenza A(H1N1)pdm09 at High Risk of Hospitalization: An Individual Participant Data Metaanalysis. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2017;64(10):1328-1334.
14. Fry AM, Goswami D, Nahar K, et al. Efficacy of oseltamivir treatment started within 5 days of symptom onset to reduce influenza illness duration and virus shedding in an urban setting in Bangladesh: a randomised placebo-controlled trial. *Lancet Infect Dis.* 2014;14(2):109-118.
15. Lee EH, Wu C, Lee EU, et al. Fatalities associated with the 2009 H1N1 influenza A virus in New York city. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2010;50(11):1498-1504.
16. Lee N, Choi KW, Chan PK, et al. Outcomes of adults hospitalised with severe influenza. *Thorax.* 2010;65(6):510-515.
17. Lee N, Cockram CS, Chan PK, Hui DS, Choi KW, Sung JJ. Antiviral treatment for patients hospitalized with severe influenza infection may affect clinical outcomes. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2008;46(8):1323-1324.
18. Louie JK, Yang S, Acosta M, et al. Treatment with neuraminidase inhibitors for critically ill patients with influenza A (H1N1) pdm09. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2012;55(9):1198-1204.

19. McGeer A, Green KA, Plevneshi A, et al. Antiviral therapy and outcomes of influenza requiring hospitalization in Ontario, Canada. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2007;45 (12):1568-1575.
20. Siston AM, Rasmussen SA, Honein MA, et al. Pandemic 2009 influenza A(H1N1) virus illness among pregnant women in the United States. *JAMA : the journal of the American Medical Association.* 2010;303(15):1517-1525.
21. Grohskopf LA, Alyanak E, Broder KR, Walter EB, Fry AM, Jernigan DB. Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices – United States, 2019-20 Influenza Season. *MMWR Recommendations and reports.* 2019;68(3):1-21.
22. Ison MG PS, Yoshida Y, Shishido T, Hayden F, Uehara T. Phase 3 Trial of Baloxavir Marboxil in High-Risk Influenza Patients (CAPSTONE-2 Study) Late breaker Abstract LB16. Presented on October 6, 2018 at ID Week 2018, San Francisco, CA. . *Open Forum Infectious Diseases.* 2018;5:S764-S765.
23. Katzen J, Kohn R, Houk JL, Ison MG. Early Oseltamivir After Hospital Admission Is Associated With Shortened Hospitalization: A 5-Year Analysis of Oseltamivir Timing and Clinical Outcomes. *Clinical infectious diseases : an official publication of the Infectious Diseases Society of America.* 2019;69(1):52-58.
24. Venkatesan S, Myles PR, Bolton KJ, et al. Neuraminidase Inhibitors and Hospital Length of Stay: A Meta-analysis of Individual Participant Data to Determine Treatment Effectiveness Among Patients Hospitalized With Nonfatal 2009 Pandemic Influenza A(H1N1) Virus Infection. *The Journal of infectious diseases.* 2019.

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national and international organizations.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

HAN Message Types

- **Health Alert:** Conveys the highest level of importance; warrants immediate action or attention.
- **Health Advisory:** Provides important information for a specific incident or situation; may not require immediate action.
- **Health Update:** Provides updated information regarding an incident or situation; unlikely to require immediate action.
- **Info Service:** Provides general information that is not necessarily considered to be of an emergent nature.

###

This message was distributed to state and local health officers, state and local epidemiologists, state and local laboratory directors, public information officers, HAN coordinators, and clinician organizations.

###

Top of Page

Additional Resources

- HAN Archive By Year
- HAN Types
- Sign Up for HAN Email Updates
- HAN Jurisdictions

Page last reviewed: January 9, 2020
Content source: Center for Preparedness and Response (CPR)