

Influenza-associated Death (Laboratory-confirmed)

Signs and Symptoms	Symptoms can include fever, chills, cough, headache, sore throat and other upper respiratory tract symptoms (such as rhinorrhea), myalgias, arthralgias, fatigue, vomiting, and diarrhea. Complications of influenza can include primary viral pneumonia, secondary bacterial pneumonia, ear infections, sinus infections, dehydration, worsening of chronic medical conditions (such as congestive heart failure, asthma, or diabetes), and death. Presentation may vary in the elderly, and fever may be absent.
Incubation	Typically 1–4 days, but can range from 1–7 days.
Source of Infection	Person-to-person transmission via large-particle respiratory droplet transmission (e.g., when an infected person coughs or sneezes near a susceptible person). Other possible routes of influenza transmission are mucosal contamination from hands touching contaminated surfaces.
Case classification	Confirmed: A laboratory-confirmed influenza-associated death is defined as a death resulting directly or indirectly from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory test. There should be no period of complete recovery between the illness and death.
Differential diagnosis	Consider other causes of respiratory illness.
Treatment	Antiviral medication, which is most effective if started within 48 hours of symptom onset.
Laboratory	Laboratory criteria for diagnosis include a variety of tests including PCR, culture and rapid diagnostic tests, among other less commonly used methods.
Public Health investigation	<p>For all cases, request medical records, complete the DOH WDRS form (enter as much information as you have—note that interviews with the family of the deceased are <i>not</i> generally necessary) and enter in WDRS. https://www.doh.wa.gov/Portals/1/Documents/5100/420-019-ReportForm-InfluenzaDeath.pdf</p> <p>Only lab-confirmed fatal cases are reportable. Note that some questions in WDRS only need to be completed if the case is under age 18.</p> <p>If the case resided at a long-term care facility (LTCF), the facility should be contacted so that influenza risk to other residents can be minimized. LTCFs are required to report to the LHJ as well as to Department of Social and Health Services (DSHS) if there is one or more lab-confirmed influenza case in residents, or if there are two or more residents with influenza-like illness in a three day period. LHJs must in turn report to DOH. See https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/PublicHealthSystemResourcesandServices/Immunization/InfluenzaFluInformation#treat (scroll to Long-Term Care Guidance section) and https://www.doh.wa.gov/Portals/1/Documents/5100/420-031-ReportForm-ILI-Outbreak.pdf (LHJ report form to DOH).</p>

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1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To determine mortality rates for laboratory-confirmed influenza-associated deaths.
2. To monitor the epidemiology of severe influenza infections.
3. To detect emerging threats such as avian and other novel influenza strains.

B. Legal Reporting Requirements for Influenza-associated Deaths (Laboratory-confirmed)

1. Healthcare providers: notifiable to local health jurisdiction within 3 business days
2. Healthcare facilities: notifiable to local health jurisdiction within 3 business days
3. Laboratories: no legal reporting requirement
4. Local health jurisdictions: notifiable to Washington State Department of Health (DOH) Communicable Disease Epidemiology (CDE) within 7 days of case investigation completion or summary information required within 21 days

C. Local Health Jurisdiction Investigation Responsibilities

1. Contact CDE **immediately** regarding suspected novel influenza infections that are fatal and investigate as novel influenza.
2. Request and review medical records. Complete the influenza case report form (<https://www.doh.wa.gov/Portals/1/Documents/5100/420-019-ReportForm-InfluenzaDeath.pdf>), and enter the data into the Washington Disease Reporting System (WDRS) as Influenza death. Note that there are some fields in WDRS that must be completed only for deaths in children under age 18 (these additional data elements are sent by CDE to CDC).
3. Additional response is per local health jurisdiction discretion.

2. THE DISEASE AND ITS EPIDEMIOLOGY

Background

Seasonal influenza epidemics occur every year in the United States most commonly during the fall and winter months.

A. Etiologic Agent

There are two main types of influenza, influenza A and influenza B. Influenza A viruses are divided into subtypes based on the hemagglutinin (H) and neuraminidase (N) proteins on their surfaces. The specific strains of influenza change frequently, necessitating parallel changes in the seasonal influenza vaccine.

B. Description of Illness

Patients with uncomplicated influenza may have symptoms that include fever, chills, cough, headache, sore throat and other upper respiratory tract symptoms (rhinorrhea), myalgias, arthralgias, fatigue, vomiting, and diarrhea. Symptoms can be minimal.

Complications of influenza can include primary viral pneumonia, secondary bacterial pneumonia, ear infections, sinus infections, dehydration, worsening of chronic medical conditions (such as congestive heart failure, asthma, or diabetes), and death.

Those at higher risk for influenza-related complications include: children younger than 5 years of age, adults 65 years and older, pregnant women, and persons with chronic medical conditions such as asthma, chronic obstructive pulmonary disease (COPD), morbid obesity, immunosuppressive therapy or disease, diabetes, hemoglobinopathy, and neuromuscular disease. American Indians and Alaska Natives may also be at higher risk for flu complications. (https://www.cdc.gov/flu/about/disease/high_risk.htm).

C. Reservoirs

Reservoirs for influenza A viruses include humans, swine, poultry and other birds and mammals. Humans are the primary reservoir for influenza B.

D. Modes of Transmission

Influenza viruses spread person-to-person primarily through large-particle respiratory droplet transmission (e.g., when an infected person coughs or sneezes near a susceptible person). Transmission via large-particle droplets requires close proximity between source and contacts because droplets do not remain suspended in the air and generally travel only a short distance (<6 feet). Other possible routes of influenza transmission are mucosal contamination from hands touching contaminated surfaces and airborne transmission. The relative contribution of each type of transmission has not been defined but for airborne transmission is thought to be small.

E. Incubation Period

The incubation period for influenza is typically 1–4 days, but can range from 1–7 days.

F. Period of Communicability

Most healthy adults with seasonal influenza are infectious to others beginning from one day before to up to 7 days following illness onset although communicability decreases rapidly 24 hours after fever resolves (without fever reducing medication). Persons who continue to be ill longer than 7 days after illness onset should be considered potentially contagious until symptoms have resolved. Children, especially younger children, can shed virus for 10 or more days. Immunocompromised persons can shed virus for weeks or months.

G. Treatment

Appropriate antiviral medication should be initiated as early as possible for patients with suspected or confirmed influenza who: 1) are hospitalized, 2) have severe, complicated,

or progressive illness or 3) are at higher risk for influenza complications (see Section 2B). Antiviral treatment is most effective when started within 48 hours of illness onset. Therefore, treatment should not be delayed while laboratory results are pending.

Complete recommendations regarding use of antiviral medications for influenza are available at: <https://www.cdc.gov/flu/professionals/antivirals/index.htm>.

Please note that resistance patterns can change within an influenza season. CDC's Flu View provides weekly data on antiviral resistance patterns for circulating strains and is available at: <https://www.cdc.gov/flu/weekly/>.

Additional therapy such as antibacterial agents should be used at the discretion of the clinicians based on the patient's clinical presentation.

3. CASE DEFINITIONS

Case Definition for Laboratory-confirmed Influenza-associated Deaths (DOH)

Confirmed: A laboratory-confirmed influenza-associated death is defined as a death resulting directly or indirectly from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory test. There should be no period of complete recovery between the illness and death. Laboratory criteria for diagnosis include:

- Influenza virus isolation in tissue cell culture from respiratory specimens;
- Reverse-transcriptase polymerase chain reaction (RT-PCR) testing of respiratory specimens;
- Immunofluorescent antibody staining (direct or indirect) of respiratory specimens;
- Rapid influenza diagnostic testing of respiratory specimens;
- Immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract tissue from autopsy specimens;
- Four-fold rise in influenza hemagglutination inhibition (HI) antibody titer in paired acute and convalescent sera.

A death should not be reported if any of the below occur:

- There is no laboratory confirmation of influenza virus infection, or
- The influenza illness is followed by full recovery to baseline health status prior to death, or
- After review and consultation there is an alternative agreed upon cause of death.

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

Diagnostic laboratory tests for influenza primarily include rapid antigen testing, viral culture, polymerase chain reaction (PCR), and immunofluorescence assays.

Information regarding laboratory diagnosis of flu is available at: <https://www.cdc.gov/flu/professionals/diagnosis/>.

B. Tests Available at Washington State Public Health Laboratories (PHL)

Influenza testing can be performed at PHL for suspected influenza-associated deaths. PHL can culture for influenza and perform RT-PCR testing to detect and subtype influenza in clinical specimens.

Note that PHL require all clinical specimens have two patient identifiers, a name **and** a second identifier (e.g., date of birth) on both the specimen label and on the submission form. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. Also include specimen source and collection date.

C. Specimen Collection

Information on specimen collection, storing, and shipping is available at:

<https://www.doh.wa.gov/Portals/1/Documents/pubs/301-018-InfluenzaTestingPHL.pdf>.

Healthcare providers who wish to submit specimens to PHL for influenza testing should contact their local health jurisdiction for approval. Specimens need to be shipped with a completed PHL Virology Submission form which is available at:

<https://www.doh.wa.gov/Portals/1/Documents/5230/302-017-SerVirHIV.pdf>.

For information regarding collection and submission of specimens from deceased patients with suspected influenza infection see:

<https://www.doh.wa.gov/Portals/1/Documents/5240/302-021-mefluguide-V2.pdf>.

5. ROUTINE CASE INVESTIGATION

The case investigation for laboratory-confirmed influenza-associated deaths involves reviewing medical records and completing the influenza case report form available at:

<https://www.doh.wa.gov/Portals/1/Documents/5100/420-019-ReportForm-InfluenzaDeath.pdf>.

A. Evaluate the Diagnosis

Identify confirmatory laboratory testing results. Request isolates be sent to Washington State Public Health Laboratories (PHL) if the patient:

- traveled internationally during the incubation period
- had contact with animals, such as poultry or swine, during the incubation period
- became ill when flu was not actively circulating in the state (e.g., summer)

B. Identify Potential Sources of Infection

Review medical records to determine if the patient traveled, was exposed to an ill person who recently traveled, or was exposed to animals such as poultry or swine during the incubation period.

C. Identify Contacts

Identification of contacts is per local health jurisdiction discretion.

D. Manage Contacts

Contact investigations for seasonal influenza cases can be performed at the discretion of the local health jurisdiction. Consult with Communicable Disease Epidemiology for managing contacts of suspect avian or other novel influenza cases.

1. Symptomatic Contacts

Symptomatic contacts at high risk for influenza complications should contact their provider immediately to discuss the need for treatment. All contacts with influenza-like illness should avoid work, school, child care, and other public settings until 24 hours after fever has resolved without the use of fever reducing medication. For antiviral treatment see Section 2G.

2. Asymptomatic Contacts

Asymptomatic contacts at high risk for influenza complications should contact their provider immediately to discuss the need for chemoprophylaxis. Post-exposure chemoprophylaxis generally is not recommended if more than 48 hours have elapsed since the last exposure to an infectious person.

F. Evaluate the Environment

Standard cleaning and disinfecting should be done for any potentially contaminated surfaces where persons with influenza may have been present. In addition, surfaces touched often, such as doorknobs, refrigerator door handles, telephones, keyboards, and bathroom handles, should be cleaned and disinfected frequently in public areas during influenza season and in a household with a potentially communicable influenza case.

For additional information regarding environmental cleaning and disinfecting see: <https://www.cdc.gov/flu/school/cleaning.htm>.

6. MANAGING SPECIAL SITUATIONS

A. CDC guidance is available for managing special situations in addition to those listed below. (See: <https://www.cdc.gov/flu/professionals/infectioncontrol/index.htm>.)

1. Schools and Child Care Settings

CDC guidance is available for preventing the spread of influenza in schools and child care settings: <https://www.cdc.gov/flu/school/index.htm>.

2. Long Term Care Facilities

If the case resided at a long-term care facility (LTCF), the facility should be contacted so that influenza risk to other residents can be minimized. LTCFs are required to report to the LHJ as well as to Department of Social and Health Services (DSHS) if there is one or more lab-confirmed influenza case in residents, or if there are two or more residents with influenza-like illness in a three day period. LHJs must in turn report to DOH.

For guidance on responding to and preventing influenza in LTCFs (including template materials for use by LHJs and LTCFs), see:

<https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/PublicHealthSystemResourcesandServices/Immunization/InfluenzaFluInformation#treat> (scroll to Long-Term Care Guidance section)

For the LHJ report form to DOH for influenza in LTCFs, see:

<https://www.doh.wa.gov/Portals/1/Documents/5100/420-031-ReportForm-ILI-Outbreak.pdf>

3. Healthcare Facilities

CDC guidance is available for managing influenza cases in healthcare settings:

<https://www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm>.

7. ROUTINE PREVENTION

A. Vaccine Recommendations

Routine annual vaccination is recommended for all persons 6 months and older. Annual vaccination is particularly important for persons at increased risk of complications and for persons in contact with those at high risk for complications (<https://www.cdc.gov/flu/protect/vaccine/index.htm>).

B. Routine Prevention Recommendations

General respiratory hygiene measures are recommended at all times, and particularly during periods when respiratory viruses are circulating:

- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it and then clean your hands;
- Wash your hands with soap and water frequently, especially after you cough or sneeze. Alcohol-based hand cleaners are also effective;
- Try to avoid close contact with people ill with respiratory symptoms;
- If you get sick with respiratory symptoms, stay home the recommended period and limit contact with others to keep from infecting them;
- Avoid touching your eyes, nose or mouth;
- Don a mask when entering a healthcare facility if you are coughing or sneezing.

ACKNOWLEDGEMENTS

We would like to acknowledge the Oregon Department of Human Services for developing the format of this document.

UPDATES

June 2012: The document was reviewed for accuracy. No significant changes were made.

December 2013: The existing guideline for influenza was divided into a guideline for novel influenza and a guideline for influenza-associated death.

February 2017: The document was reviewed for accuracy. Added a link to the WA DOH guidance for long-term care facilities to page 4. No other changes were made.

Influenza-associated Death (Laboratory-confirmed) Reporting and Surveillance Guidelines

April 2018: Added a cover page, updated to reflect use of Washington Disease Reporting System (WDRS) instead of the Public Health Issues Management System (PHIMS) and web links checked and updated.

March 2020: The document was reviewed for accuracy. No significant changes were made.