

Influenza-Associated Pediatric Mortality

Case Definition

A pediatric influenza-associated death is defined for surveillance purposes as a death resulting from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test in a person aged <18 years.

A death should not be reported if:

1. There is no laboratory confirmation of influenza virus infection.
2. The influenza illness is followed by full recovery to baseline health status prior to death.
3. The death occurs in a person 18 years or older.
4. After review and consultation there is an alternative agreed upon cause of death.

Laboratory criteria for diagnosis

Laboratory testing for influenza virus infection may be done on pre- or post-mortem clinical specimens, and include identification of influenza A or B virus infections by a positive result by at least one of the following:

- Influenza virus isolation in tissue cell culture from respiratory specimens;
- Reverse-transcriptase polymerase chain reaction (RT-PCR) testing of respiratory specimens;
- Direct or indirect immunofluorescent antibody staining of respiratory specimens;
- Commercial 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.*

Case classification

Confirmed - A death meeting the clinical case definition that is laboratory confirmed.

Laboratory confirmation is required as part of the case definition; therefore, all deaths reported in the *MMWR* will be classified as confirmed. However, data on deaths meeting the clinical case definition but pending laboratory confirmation may be entered in the reporting system and listed as “Not Classified.”

Cases entered into the reporting system cannot be deleted. Therefore cases entered with laboratory results pending that are determined to not be influenza-related should be classified as “Not a Case.” Cases initially classified as confirmed but that are later determined to not be influenza-related should also be reclassified as “Not a Case.”

Comment

*Serologic testing for influenza is available in a limited number of laboratories, and should only be considered as evidence of recent infection if a four-fold rise in influenza (HI) antibody titer is demonstrated in paired sera. Single serum samples are not interpretable.

Influenza-Associated Pediatric Mortality Reporting Instructions

This document is to guide state and local health department staff in completing the case report form and the use of the CDC Pediatric Influenza-Associated Death Reporting System found on the Secure Data Network (SDN). In order to report cases within this system, each person who will be entering data from the state or local health department will need a digital certificate. To obtain a digital certificate, contact CDC SDN support at (800) 532-9929 (option 1).

I. STATE USE ONLY Section (case report form only)

This section at the top of the form should be used by your state health office to record personal identifiers such as name and address of patient. Do not send this information to the Centers for Disease Control and Prevention (CDC). The web-based reporting system will not have data entry fields for this information.

II. Patient Demographics

1. State – state of residence of patient
 - i. States are responsible for reporting their residents, regardless of the location of death. If a patient dies outside their state of residence, the state where the death occurs should make arrangements to transfer any data regarding the case to the patient's state of residence, who should then report the case to CDC. This is a required field in the reporting system and is automatically populated in the web-based report.
2. County – county of residence of patient
3. State ID – the state assigned unique identifier (required field).
4. CDC ID – the CDC case ID automatically assigned by the web-based reporting system.
5. Age – The age of the patient at the time of death. Age may be entered as days, months, or years. All cases should be <18 years old.
6. Date of birth – can be used to search for cases in the web-based reporting system.
7. Sex
8. Ethnicity
9. Race

III. Death Information

10. Date of illness onset – earliest date of symptom onset associated with influenza illness (required field).
11. Date of death – (required field).
- 12a. Autopsy performed?
- 12b. Pathology specimens sent to CDC?
- 13a. Cardiac/respiratory arrest occur outside the hospital?
- 13b. Location of death – select the answer that best describes the last location where a pulse was present. If other, please specify location in text field.

IV. Influenza Testing

The purpose of the influenza testing section is to collect diagnostic information. Multiple testing methods may be recorded, and negative results as well as positive results can be entered. All reported cases are required to have at least one positive diagnostic test for influenza along with a corresponding specimen collection date. Result values are specific to the test type that is listed. The web-based reporting system will require a specimen collection date for every test type entered.

Commercial rapid diagnostic test – any commercially available rapid test by any manufacturer. This will include tests that may and may not differentiate influenza A from B.

Viral culture – any test results obtained from inoculating cell culture with a specimen obtained from the patient. Specimens can include nasal/pharyngeal swab, etc.

Immunofluorescent antibody (DFA) or (IFA) – staining of cells from patient specimen. Specific for influenza virus type A or B.

Enzyme immunoassay (EIA) – often, but not always, synonymous with rapid antigen testing

RT-PCR – any test results obtained by amplifying the genetic material obtained from a patient specimen. Specimens can include nasal/pharyngeal swab, etc.

Immunohistochemistry (IHC) - this method is performed in a limited number of laboratories, and involves immunohistochemical staining to detect influenza viral antigens in tissue specimens. Tracheal and bronchial airway tissues provide the highest yield. States may request CDC to perform this testing in questionable cases.

V. Culture confirmation of INVASIVE bacterial pathogens

14a. Was a specimen collected for bacterial culture from a normally sterile site (e.g. blood, cerebrospinal fluid [CSF], tissue, or pleural fluid)?

The purpose of this question is to collect data on bacterial infections that may have been complicating factors of the influenza illness and potentially led to death. It is important to include information about bacterial organisms that were cultured from normally sterile sites.

14b. If yes, please indicate the specific site and date from which the specimen was obtained as well as the bacterial culture result

14c. The result of the bacterial culture

14d. If positive, the organism cultured

- i. Select any of the species listed or select other and indicate the species isolated
- ii. If *Neisseria meningitidis* is isolated, indicate serogroup, if known

VI. Culture confirmation of bacterial pathogens from NON-STERILE SITES

14e. Were other respiratory specimens collected for bacterial cultures (e.g. sputum, ET tube aspirate)?

14f. If yes, please indicate the specific site and date from which the specimen was obtained as well as the bacterial culture result

14g. The result of the bacterial culture

14h. If positive, the organism cultured

- i. Select any of the species listed or select other and indicate the species isolated
- ii. If *Neisseria meningitidis* is isolated, indicate serogroup, if known

VII. Medical Care

15. Did the patient receive medical care for this illness before admission to the hospital and/or death (if occurred outside the hospital)?

16. If YES, indicate level(s) of care received (check all that apply):

- i. An Urgent Care visit should be classified as “outpatient clinic”

17. Did the patient require mechanical ventilation?

- i. Do not include cases in which the patient experienced cardio-respiratory arrest and was intubated during an unsuccessful resuscitative effort.

VIII. Clinical Diagnoses and Complications

18a. Did complications occur during the acute illness?

18b. If yes, check all complications that occurred during the acute illness.

- i. Complications are usually stated on the hospital discharge summary or in the general hospital chart. Additionally, hospital physicians may be able to provide information regarding a patient’s hospital course.

Acute Respiratory Disease Syndrome (ARDS)

Another viral co-infection – specify diagnosis if available.

Bronchiolitis

Croup

Encephalopathy/encephalitis

Pneumonia (Chest X-Ray confirmed)

Reye syndrome

Seizures

Sepsis

Shock

Other – Use this selection if there is a complication that occurred during the acute illness that is not available for selection

19a. Did the child have any medical conditions that existed before the state of acute illness?

19b. If yes, check all medical conditions that existed before the start of the acute illness:

- i. Previous medical conditions are often listed on the hospital admission note or in the general hospital chart. Additionally, hospital physicians may be able to provide information regarding a patient's previous medical conditions.

Asthma/reactive airway disease

Cardiac disease (specify)

Chronic pulmonary disease (specify) – specify any underlying chronic pulmonary disease that existed before the acute illness, other than asthma.

Cystic fibrosis

Diabetes mellitus

Hemoglobinopathy (e.g. sickle cell disease) – does not include sickle cell trait

History of febrile seizures

Immunosuppressive condition (specify) - includes HIV infection, immunosuppressive therapy

Metabolic disorder (specify) - includes endocrine disorders

Moderate to severe developmental delay

Neuromuscular disorder (including cerebral palsy, specify)

Pregnant (specify gestational age in weeks)

Renal disease (specify)

Seizure disorder - includes disorders other than febrile seizures

Skin or soft tissue infection

Other – Use this selection if there is an underlying condition that is not available for selection.

IX. Medication and Therapy History

20a. Was the patient receiving any of the following therapies in the 7 days prior to illness onset or after illness onset? (check all that apply)

Aspirin or aspirin-containing products

NSAID or NSAID-containing products

20b. Was the patient receiving any of the following therapies prior to illness onset? (check all that apply)

Antibiotic therapy

Antiviral therapy (specify)

Chemotherapy or radiation therapy

Steroids by mouth or injection

Other immunosuppressive therapy (specify)

X. Influenza vaccine history

21. Did the patient receive any influenza vaccine during the current season (before illness)?
22. If YES, please specify the type of influenza vaccine received before illness onset:
 - i. Select either the trivalent inactivated vaccine (injected) or live attenuated vaccine (nasal spray).
23. If YES, how many doses did the patient receive and what was the timing of each dose? (Enter dates of vaccination if available)
 - i. Children receive either one or two doses of influenza vaccine depending on their age. If the child received only 1 dose, then select 1 dose ONLY. If the child received two doses, select 2 doses. Only one of these two selections can be made in the web-based reporting system.
 - ii. For each selection indicate if the last dose was given more than or equal to 14 days, or less than 14 days, before the patient reported symptoms.
24. Did the patient receive any influenza vaccine in previous seasons?
 - i. Refers to any season in the past

XI. Submitting Information

The person submitting the form, their contact phone number, email, and date submitted will be automatically populated in the web-based reporting system with the information corresponding to the person entering the information. The date submitted will be considered the date reported by the web-based system.



Influenza-Associated Pediatric Deaths Case Report Form

Form approved
OMB No. 0920-0007

STATE USE ONLY – DO NOT SEND INFORMATION IN THIS SECTION TO CDC

Last Name: _____ First Name: _____ County: _____
Address: _____ City: _____ State, Zip: _____

Patient Demographics

1. State:	2. County:	3. State ID:	4. CDC ID:
5. Age: _____ <input type="checkbox"/> Days <input type="checkbox"/> Months <input type="checkbox"/> Years	6. Date of birth: _____/_____/_____ MM DD YYYY	7. Sex: <input type="checkbox"/> Male <input type="checkbox"/> Female	8. Ethnicity: <input type="checkbox"/> Hispanic or Latino <input type="checkbox"/> Not Hispanic or Latino <input type="checkbox"/> Unknown
9. Race: <input type="checkbox"/> White <input type="checkbox"/> Black <input type="checkbox"/> Asian <input type="checkbox"/> Native Hawaiian or Other Pacific Islander <input type="checkbox"/> American Indian or Alaska Native <input type="checkbox"/> Unknown			

Death Information

10. Date of illness onset: _____/_____/_____ MM DD YYYY	11. Date of death: _____/_____/_____ MM DD YYYY	12 a. Was an autopsy performed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown 12 b. Were pathology specimens sent to CDC? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
13 a. Did cardiac/respiratory arrest occur outside the hospital? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		
13 b. Location of death: <input type="checkbox"/> Outside Hospital <input type="checkbox"/> Emergency Dept (ER) <input type="checkbox"/> Inpatient ward <input type="checkbox"/> ICU <input type="checkbox"/> Other (specify): _____		

Influenza Testing (check all that were used)

Test Type	Result	Specimen Collection Date
<input type="checkbox"/> Commercial rapid diagnostic test	<input type="checkbox"/> Influenza A <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Influenza A/B (Not Distinguished)	____/____/____
<input type="checkbox"/> Viral culture	<input type="checkbox"/> Influenza A (Subtyping Not Done) <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Influenza A (Unable To Subtype) <input type="checkbox"/> Influenza A(H1) <input type="checkbox"/> Influenza A(H3)	____/____/____
<input type="checkbox"/> Direct fluorescent antibody (DFA)	<input type="checkbox"/> Influenza A <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Influenza A/B	____/____/____
<input type="checkbox"/> Indirect fluorescent antibody (IFA)	<input type="checkbox"/> Influenza A <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Influenza A/B	____/____/____
<input type="checkbox"/> Enzyme immunoassay (EIA)	<input type="checkbox"/> Influenza A (Subtyping Not Done) <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Influenza A (Unable To Subtype) <input type="checkbox"/> Influenza A(H1) <input type="checkbox"/> Influenza A(H3)	____/____/____
<input type="checkbox"/> RT-PCR	<input type="checkbox"/> Influenza A (Subtyping Not Done) <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative <input type="checkbox"/> Influenza A (Unable To Subtype) <input type="checkbox"/> Influenza A(H1) <input type="checkbox"/> Influenza A(H3)	____/____/____
<input type="checkbox"/> Immunohistochemistry (IHC)	<input type="checkbox"/> Influenza A <input type="checkbox"/> Influenza B <input type="checkbox"/> Negative	____/____/____



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Culture confirmation of INVASIVE bacterial pathogens

14 a. Was a specimen collected for bacterial culture from a normally sterile site (e.g., blood, cerebrospinal fluid [CSF], tissue, or pleural fluid)? Yes No Unknown

14 b. If yes, please indicate the site from which the specimen was obtained.

Specimen Type	Collection Date	Results
<input type="checkbox"/> Blood	___/___/___	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown
<input type="checkbox"/> Pleural fluid	___/___/___	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown
<input type="checkbox"/> CSF	___/___/___	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown
<input type="checkbox"/> Other _____	___/___/___	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown
<input type="checkbox"/> Unknown		

14 c. What was the result of the bacterial culture? Yes No Unknown

14 d. If positive, please check the organism cultured.

- Streptococcus pneumoniae* *Staphylococcus aureus*, methicillin **sensitive** *Neisseria meningitidis* (serogroup, if known): _____
- Haemophilus influenzae* type b *Staphylococcus aureus*, methicillin **resistant (MRSA)** Group A streptococcus
- Haemophilus influenzae* not-type b *Staphylococcus aureus*, **sensitivity not done** Other invasive bacteria: _____

Culture confirmation of bacterial pathogens from NON-STERILE SITES

14 e. Were other respiratory specimens collected for bacterial culture (e.g., sputum, ET tube aspirate)? Yes No Unknown

14 f. If yes, please indicate the site from which the specimen was obtained.

Specimen Type	Collection Date	Results
<input type="checkbox"/> Sputum	___/___/___	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown
<input type="checkbox"/> ET tube	___/___/___	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown
<input type="checkbox"/> Other _____	___/___/___	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Unknown
<input type="checkbox"/> Unknown		

14 g. What was the result of the bacterial culture? Yes No Unknown

14 h. If positive, please check the organism cultured.

- Streptococcus pneumoniae* *Staphylococcus aureus*, methicillin **sensitive** *Neisseria meningitidis* (serogroup, if known): _____
- Haemophilus influenzae* type b *Staphylococcus aureus*, methicillin **resistant (MRSA)** Group A streptococcus
- Haemophilus influenzae* not-type b *Staphylococcus aureus*, **sensitivity not done** Other bacteria: _____

Medical Care

15. Did the patient receive medical care for this illness before admission to the hospital and/or death (if occurred outside hospital)? Yes* No Unknown

16. If YES*, indicate level(s) of care received (check all that apply): Outpatient clinic ER Inpatient ward ICU

17. Did the patient require mechanical ventilation? Yes No Unknown



Influenza-Associated Pediatric Deaths Case Report Form

Clinical Diagnoses and Complications

18 a. Did complications occur during the acute illness: Yes No Unknown

18 b. If yes, check all complications that occurred during the acute illness:

- Pneumonia (Chest X-Ray confirmed) Acute Respiratory Disease Syndrome (ARDS) Croup Seizures
- Bronchiolitis Encephalopathy/encephalitis Reye syndrome Shock
- Another viral co-infection: _____ Other: _____

19 a. Did the child have any medical conditions that existed before the start of the acute illness: Yes No Unknown

19 b. If yes, check all medical conditions that existed before the start of the acute illness:

- Moderate to severe developmental delay Hemoglobinopathy (e.g. sickle cell disease) Asthma/ reactive airway disease
- Diabetes mellitus History of febrile seizures Seizure disorder Cystic fibrosis
- Cardiac disease (specify) _____ Renal disease (specify) _____ Skin or soft tissue infection
- Chronic pulmonary disease (specify) _____ Immunosuppressive condition (specify) _____
- Metabolic disorder (specify) _____ Neuromuscular disorder (including cerebral palsy) (specify) _____
- Pregnant (specify gestational age) _____ weeks Other (specify) _____

Medication and Therapy History

20 a. Was the patient receiving any of the following therapies in the 7 days prior to illness onset or after illness onset? (check all that apply)

- Aspirin or aspirin-containing products NSAID or NSAID-containing products

20 b. Was the patient receiving any of the following therapies prior to illness onset? (check all that apply)

- Antibiotic therapy Chemotherapy or radiation therapy Steroids by mouth or injection other immunosuppressive therapy: _____
- Antiviral therapy specify _____

Influenza vaccine history

21. Did the patient receive any influenza vaccine during the current season (before illness) Yes* No Unknown

22. If YES*, please specify influenza vaccine received before illness onset: Trivalent inactivated influenza vaccine (TIV) [injected] Live-attenuated influenza vaccine (LAIV) [nasal spray] Unknown

23. If YES*, how many doses did the patient receive and what was the timing of each dose? (Enter vaccination dates if available)

- 1 dose ONLY <14 days prior to illness onset Date dose given: ____/____/____
 ≥14 days prior to illness onset MM DD YYYY
- 2 doses 2nd dose given <14 days prior to onset Date of 1st dose: ____/____/____ Date of 2nd dose: ____/____/____
 2nd dose given ≥14 days prior to onset MM DD YYYY MM DD YYYY

24. Did the patient receive any influenza vaccine in previous seasons? Yes No Unknown

Submitted By: _____ Date: ____/____/____
Phone No.: (____) _____ MM DD YYYY
E-mail Address: _____

Public reporting burden of this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer, 1600 Clifton Road NE, MS E-11, Atlanta, Georgia 30333; ATTN: PRA (0920-0007).