09-ID-44

Committee: Infectious

Title: Public Health Reporting and National Notification for Pediatric Influenza-Associated Mortality

I. Statement of the Problem

The Council of State and Territorial Epidemiologists (CSTE) position statement 07-EC-02 recognized the need to develop an official list of nationally notifiable conditions and a standardized reporting definition for each condition on the official list. The position statement also specified that each definition had to comply with American Health Information Community recommended standards to support "automated case reporting from electronic health records or other clinical care information systems." In July 2008, CSTE identified sixty-eight conditions warranting inclusion on the official list, each of which now requires a standardized reporting definition.

II. Background and Justification

Background

Approximately 36,000 deaths in the U.S. are attributable annually to influenza. While a majority of these deaths occur among the elderly, there has been an increasing recognition of the importance of influenza as a cause of death among children. CSTE recommended in 2004 that influenza-associated pediatric deaths be made nationally reportable. More complete data are needed to fully define the burden of severe influenza in children and to evaluate the effectiveness of the recently expanded recommendations for influenza vaccination of children in identifying risk factors contributing to deaths associated with influenza that might be targeted for intervention.

Justification

Influenza-Associated Pediatric Mortality meets the definition of a nationally and **standard** notifiable condition—as specified in CSTE position statement 08-EC-02—for the following reasons:

- A majority of state/territorial jurisdictions—or state/territorial jurisdictions that when taken together comprise a majority of the US population—have laws or regulations requiring **standard** reporting of the condition from local health care providers to public health authorities
- CDC requests **standard** notification from state public health agencies of the condition to federal authorities

III. Statement of the desired action(s) to be taken

CSTE requests that CDC adopt this standardized reporting definition for Influenza-Associated Pediatric Mortality to facilitate more timely, complete, and standardized local reporting and national notification.

IV. Goals of Surveillance

To provide information on the temporal, geographic, and demographic occurrence of Influenza-Associated Pediatric Mortality to facilitate its prevention and control, and to identify specific risk factors contributing to deaths that might be amiable to preventive control strategies.

V. Sources of Surveillance Data

Surveillance for Influenza-Associated Pediatric Mortality should use the sources of data and the extent of coverage listed in table 1.

TableV. Recommended sources of data and extent of coverage for ascertaining cases of Influenza-Associated Pediatric Mortality

	Coverage
Source of data for case ascertainment	Population-wide
clinician reporting	X
laboratory reporting	X
reporting by other entities (e.g., hospitals, veterinarians, pharmacies)	X
death certificates	X
hospital discharge or outpatient records	X
extracts from electronic medical records	X
telephone survey	
school-based survey	
other _____	

VI. Criteria for Reporting

Reporting refers to the process of healthcare providers or institutions (e.g., clinicians, clinical laboratories, hospitals) submitting basic information to governmental public health agencies about cases of illness that meet certain reporting requirements or criteria. The purpose of this section is to provide those criteria to determine whether a specific illness should be reported.

A. Narrative description of criteria to be used to determine whether a case should be reported to public health authorities.

Report any illness to public health authorities that meets all of the following criteria:

1. Death in a person <18 years of age:
    a. Resulting from a clinically compatible illness (e.g., fever >100 degrees Fahrenheit with cough or sore throat), and
    b. Confirmed to be influenza by any of the appropriate diagnostic test:
        i. Influenza virus isolation from respiratory specimens
        ii. Reverse-transcriptase polymerase chain reaction (RT-PCR) from respiratory specimens positive for influenza virus
        iii. Immunofluorescent antibody staining (direct or indirect) of respiratory specimens positive for influenza virus
        iv. Positive rapid influenza diagnostic testing of respiratory specimens
        v. Positive immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract tissue from autopsy specimens
        vi. Four-fold rise in influenza hemagglutination inhibition (HI) antibody titer in paired acute and convalescent sera

2. There should be no period of complete recovery between the illness and death.

A death should <u>not</u> 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.

Other recommended reporting procedures

- All cases of Influenza-Associated Pediatric Mortality should be reported.
- Reporting should be on-going and routine.

B. Table of criteria to determine whether a case should be reported to public health authorities

Table VI-B. Table of criteria to determine whether a case should be reported to public health authorities. Requirements for reporting are established under State and Territorial laws and/or regulations and may differ from jurisdiction to jurisdiction. These criteria are suggested as a standard approach to identifying cases of this condition for purposes of reporting, but reporting should follow State and Territorial law/regulation if any conflicts occur between these criteria and those laws/regulations.

Criterion	Reporting
Clinical Evidence	
Death of a person < 18 years of age	N
Illness clinically compatible with influenza infection	N
Cause of death not related to influenza	A
Recovery from febrile, respiratory illness prior to illness leading to death	A
Laboratory Evidence	
Identification of influenza A or B virus infections by at least one of the following:	
Influenza virus isolation from respiratory specimens	O
Reverse-transcriptase polymerase chain reaction (RT-PCR) from respiratory specimens positive for influenza virus	O
Immunofluorescent antibody staining (direct or indirect) of respiratory specimens positive for influenza virus	O
Positive rapid influenza diagnostic testing of respiratory specimens	O
Positive immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract tissue from autopsy specimens	O
Four-fold rise in influenza hemagglutination inhibition (HI) antibody titer in paired acute and convalescent sera	O

Notes:
N = All "N" criteria in the same column are Necessary to identify a case for reporting.
A = This criterion must be absent (i.e., NOT present) for the case to meet the reporting criteria.
O = At least one of these "O" (Optional) criteria in each category (i.e., clinical evidence and laboratory evidence) in the same column—in conjunction with all "N" criteria in the same column—is required to identify a case for reporting. (These optional criteria are alternatives, which means that a single column will have either no O criteria or multiple O criteria; no column should have only one O.)

C. Disease Specific Data Elements:

Disease-specific data elements to be included in the initial report are listed below.

State
County
Age
Sex
Ethnicity
Race
Date of illness onset
Date of death
Influenza test type
Influenza test result
Total doses influenza vaccine
Date of last influenza vaccination

VII. Case Definition

A. Narrative description of criteria to determine whether a case should be classified as confirmed.

Case Definition

An 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. There should be no period of complete recovery between the illness and death. Influenza-associated deaths in all persons aged <18 years should be reported.

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;
- 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*.

Case classification

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

Laboratory or rapid diagnostic test confirmation is required as part of the case definition; therefore, all reported deaths will be classified as confirmed.

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.

B. Classification Tables

Table VII-B lists the criteria that must be met for a case to be classified as confirmed.

Table VII-B. Table of criteria to determine whether a case is classified.

Criterion	**Case Definition**
	Confirmed
Clinical Evidence	
Death of a person < 18 years of age	N
Illness clinically compatible with influenza infection	N
Cause of death not related to influenza	A
Recovery from febrile, respiratory illness prior to illness leading to death	A
Laboratory Evidence	
Identification of influenza A or B virus infections by at least one of the following	N
Influenza virus isolation from respiratory specimens	O
Reverse-transcriptase polymerase chain reaction (RT-PCR) from respiratory specimens positive for influenza virus	O
Immunofluorescent antibody staining (direct or indirect) of respiratory specimens positive for influenza virus	O
Positive rapid influenza diagnostic testing of respiratory specimens	O
Positive immunohistochemical (IHC) staining for influenza viral antigens in respiratory tract tissue from autopsy specimens	O

Notes:
N = All "N" criteria in the same column are Necessary to classify a case.
A = This criterion must be absent (i.e., NOT present) for the case to meet the classification criteria.
O = At least one of these "O" (Optional) criteria in each category (i.e., clinical evidence and laboratory evidence) in the same column—in conjunction with all "N" criteria in the same column—is required to classify a case.

VIII. Period of Surveillance

Surveillance should be on-going.

IX. Data sharing/release and print criteria

Notification to CDC for confirmed cases is recommended.

- Data reported to NCIRD staff is summarized weekly internally via an NCIRD weekly surveillance report for vaccine preventable diseases. Electronic reports of pediatric influenza mortality cases in NNDSS are also summarized weekly in the MMWR Tables and the in the weekly influenza activity report, FluView. Annual case data is also summarized in the yearly Summary of Notifiable Diseases.
- Core data will be published weekly in the NNDSS MMWR provisional tables and influenza activity report, FluView, then in the MMWR Annual Summary of Notifiable Diseases while additional clinical, epidemiologic, and virologic data will be presented in separate reports.
- State-specific compiled data will continue to be published in the weekly and annual MMWR. In addition to those reports, data are published weekly through the FluView weekly report.

X. References

Council of State and Territorial Epidemiologists (CSTE). CSTE official list of nationally notifiable conditions. CSTE position statement 07-EC-02. Atlanta: CSTE; June 2007. Available from: http://www.cste.org.

Centers for Disease Control and Prevention (CDC). Case definitions for infectious conditions under public health surveillance. MMWR 1997;46(No. RR-10):1–57. Available from: http://www.cdc.gov/mmwr/

Centers for Disease Control and Prevention (CDC). National notifiable diseases surveillance system: case definitions. Atlanta: CDC. Available from: http://www.cdc.gov/ncphi/disss/nndss/casedef/index.htm Last updated: 2008 Jan 9. Accessed:

http://www.cdc.gov/ncphi/disss/nndss/casedef/Influenza-Associated_current.htm

Council of State and Territorial Epidemiologists (CSTE). Criteria for inclusion of conditions on CSTE nationally notifiable condition list and for categorization as immediately or routinely notifiable. CSTE position statement 08-EC-02. Atlanta: CSTE; June 2008. Available from: http://www.cste.org.

Council of State and Territorial Epidemiologists, Centers for Disease Control and Prevention. CDC-CSTE Intergovernmental Data Release Guidelines Working Group (DRGWG) Report: CDC-ATSDR Data Release Guidelines and Procedures for Re-release of State-Provided Data. Atlanta: CSTE; 2005. Available from: http://www.cste.org/pdffiles/2005/drgwgreport.pdf or http://www.cdc.gov/od/foia/policies/drgwg.pdf.

Council of State and Territorial Epidemiologists. Influenza-Associated Pediatric Mortality 07-ID-14. Atlanta: CSTE; June 2007. Available from: http://www.cste.org

Heymann DL, editor. Control of communicable diseases manual. 18th edition. Washington: American Public Health Association; 2004.

Treanor JJ. Influenza virus. In: Mandell GL, Bennett JE, Dolin R, editors. Principles and Practice of Infectious Diseases, 6th edition. Philadelphia: Churchill Livingstone; 2005.

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