09-ID-50

Committee: Infectious

Title: Public Health Reporting and National Notification for Mumps

I. Statement of the Problem

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

Mumps is characterized by swelling of either one or both of the parotid glands of two or more days duration. It may be accompanied by fever and swelling of the submandibular and sublingual glands. While typically self-limited and mild, complications of mumps may include aseptic meningitis, encephalitis, acute hearing loss, orchitis, oophoritis, mastitis and pancreatitis. Despite high immunization levels, a few isolated outbreaks and one large epidemic have been recognized in the US in recent years. The US mumps epidemic in 2006 was preceded by several years of widespread disease in Europe, particularly the UK, where immunization rates are low. Surveillance of mumps is needed to detect and control outbreaks and to evaluate current prevention strategies.

Justification

Mumps meets the following criteria for a nationally and **standard** notifiable condition, as specified in CSTE position statement 08-EC-02:

- A majority of state and territorial jurisdictions—or jurisdictions comprising a majority of the US population—have laws or regulations requiring **standard** reporting of Mumps to public health authorities
- CDC requests **standard** notification of Mumps to federal authorities CDC has condition-specific policies and practices concerning the agency's response to, and use of, notifications.

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

CSTE requests that CDC adopt this standardized reporting definition for Mumps to facilitate more timely, complete, and standardized local and national reporting of this condition.

IV. Goals of Surveillance

To provide information on the temporal, geographic, and demographic occurrence of mumps to facilitate its prevention and control.

V. Methods for Surveillance

Surveillance for Mumps should use the sources of data and the extent of coverage listed in table V below.

Table V. Recommended sources of data and extent of coverage for ascertaining cases of Mumps.

	Coverage	
Source of data for case ascertainment	Population-wide	Sentinel sites
clinician reporting	X	
laboratory reporting	X	
reporting by other entities (e.g., hospitals, veterinarians, pharmacies)	X	
death certificates		
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 that should be used by humans and machines to determine whether a specific illness should be reported.[1]

[1] "Human-based" criteria (described below under "A. Narrative") can be applied by medical care providers and laboratory staff based on clinical judgment and clinical diagnosis. Machine-based criteria (described below under "B. Table") can be applied using computerized algorithms that operate in electronic health record systems, including computerized records of laboratory test orders and laboratory test results.

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

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

1. Acute illness clinically compatible with mumps in a person with any of the epidemiologic risks factors listed in Table VI-B.
2. Acute illness clinically compatible with mumps in a person for whom any of the laboratory tests listed in Table VI-B have been ordered.
3. Acute illness clinically compatible with mumps (as evidenced by the symptoms listed in Table VI-B)
4. A person with laboratory tests suggestive of mumps without clinical information.
5. During an outbreak of mumps, any person with aseptic meningitis, encephalitis, orchitis, oophoritis, mastitis, pancreatitis or acute onset of hearing loss

Other recommended reporting procedures

- All cases of Mumps should be reported.
- Reporting should be on-going and routine.
- Frequency of reporting should follow the state health department's routine schedule.

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

Table VI-B. Proposed Table of criteria to determine whether a case should be reported to public health authorities. Note: The following criteria are proposed for evaluation before general implementation. For purposes of currently implementing reporting the narrative description in VI-A, should be used.

Criterion	Reporting		
Clinical Presentation			
Parotitis Duration 2 days or more	S		
Swelling of sublingual or submandibular salivary glands 2 days or more	S		
Fever	C		
Aseptic meningitis			O
Encephalitis			O
Orchitis			O
Oophoritis			O
Mastitis			O

Pancreatitis			O
Acute onset hearing loss			O
Laboratory tests			
Mumps virus		O	
PCR test for mumps-specific nucleic acid		O	
Mumps IgM antibody		O	
Acute and Convalescent anti-mumps IgG by quantitative assay		O	
Standardized mumps serologic assay to determine seroconversion		O	
Epidemiological risk factors			
Contact of a confirmed mumps case			O
Member of a risk group defined by public health authorities during an outbreak.			O
Mumps vaccination in past 4 weeks			

Notes:
S = This criterion alone is sufficient to report a case
O = At least one of these "O" criteria in each category in the same column (e.g., clinical presentation and laboratory findings)—in conjunction with all other "N" criteria in the same column—is required to report a case.
A = This criterion must be absent (i.e., NOT present) for the case to meet the reporting criteria or case definition.
C = This finding corroborates (i.e., supports) the diagnosis of—or is associated with—Mumps, but is not included in the case definition and is not required for reporting.

C. Disease Specific Data Elements:

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

Epidemiological Risk Factors

Date of onset of parotitis
Contact of mumps case
Destination of recent travel (if any)
Date of return of travel

Immunization History

Number of doses of mumps-containing vaccine received
Date of last dose of mumps-containing vaccine

VII. Case Definition for Case Classification

A. Narrative description of criteria to determine whether a case should be classified as confirmed, probable (presumptive), or suspected (possible) is provided:

Suspected:

Clinically compatible illness characterized by: aseptic meningitis, encephalitis, hearing loss, orchitis, oophoritis, parotitis or other salivary gland swelling, mastitis or pancreatitis without laboratory testing

OR

Acute onset of unilateral or bilateral tender, self-limited swelling of the parotid and or other salivary gland(s), lasting at least 2 days without laboratory testing,

OR

A person without clinical information but with any of the following laboratory tests suggestive of mumps

- Isolation of mumps virus from clinical specimen, or
- Detection of mumps nucleic acid (e.g., standard or real time RT-PCR assays), or
- Detection of mumps IgM antibody, or
- Demonstration of specific mumps antibody response in absence of recent vaccination, either a four-fold increase in IgG titer as measured by quantitative assays, or a seroconversion from negative to positive using a standard serologic assay of paired acute and convalescent serum specimens.

Probable:

Acute onset of unilateral or bilateral tender, self-limited swelling of the parotid and or other salivary gland(s), lasting at least 2 days without laboratory confirmation

AND

epidemiologically linked to a clinically compatible case.

Confirmed:

Acute onset of unilateral or bilateral tender, self-limited swelling of the parotid and or other salivary gland(s), lasting at least 2 days

OR

Clinically compatible illness characterized by: aseptic meningitis, encephalitis, hearing loss, orchitis, oophoritis, parotitis or other salivary gland swelling, mastitis or pancreatitis

AND

Epidemiologically linked to a confirmed case, **OR**

Has laboratory confirmation by any of the following:

- Isolation of mumps virus from clinical specimen, or
- Detection of mumps nucleic acid (e.g., standard or real time RT-PCR assays), or
- Detection of mumps IgM antibody, or
- Demonstration of specific mumps antibody response in absence of recent vaccination, either a four-fold increase in IgG titer as measured by quantitative assays, or a seroconversion from negative to positive using a standard serologic assay of paired acute and convalescent serum specimens.

Case Classification for Import Status

Internationally imported case: An internationally imported case is defined as a case in which mumps results from exposure to mumps virus outside the United States as evidenced by at least some of the exposure period (12–25 days before onset of parotitis or other mumps-associated complications) occurring outside the United States and the onset of parotitis or other mumps-associated complications within 25 days of entering the United States and no known exposure to mumps in the U.S. during that time. All other cases are considered U.S.-acquired cases.

U.S.-acquired case: A U.S.-acquired case is defined as a case in which the patient had not been outside the United States during the 25 days before onset of parotitis or other mumps-associated complications or was known to have been exposed to mumps within the United States.

U.S.-acquired cases are sub-classified into four mutually exclusive groups:

Import-linked case: Any case in a chain of transmission that is epidemiologically linked to an internationally imported case.

Imported-virus case: A case for which an epidemiologic link to an internationally imported case was not identified but for which viral genetic evidence indicates an imported mumps genotype, i.e., a genotype that is not occurring within the United States in a pattern indicative of endemic transmission. An endemic genotype is the genotype of any mumps virus that occurs in an endemic chain of transmission (i.e., lasting ≥12 months). Any genotype that is found repeatedly in U.S.-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.

Endemic case: A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of mumps virus transmission continuous for ≥12 months within the United States.

Unknown source case: A case for which an epidemiological or virological link to importation or to endemic transmission within the U.S. cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to assure that they do not represent a sustained U.S.-acquired chain of transmission or an endemic chain of transmission within the U.S.

Note: Internationally imported, import-linked, and imported-virus cases are considered collectively to be import-associated cases.

Comment

With previous contact with mumps virus either through vaccination (particularly with 2 doses) or natural infection, serum mumps IgM test results may be negative; IgG test results may be positive at initial blood draw and viral detection in RT-PCR or culture may have low yield. Therefore, mumps cases should not be ruled out by negative laboratory results. Serologic tests should be interpreted with caution, as false positive and false negative results are possible with IgM tests.

Currently, there is insufficient information to determine whether any mumps strains are endemic to the United States or to distinguish endemic from non-endemic strains. States may also choose to classify cases as "out-of-state-imported" when imported from another state in the United States. For national reporting, however, cases will be classified as either internationally imported or U.S.-acquired.

States may also choose to classify cases as "out-of-state-imported" when imported from another state in the United States. For national reporting, however, cases will be classified as either internationally imported or U.S-acquired.

B. Classification Tables

Table VII-B lists the criteria that must be met for a case to be classified as confirmed, probable (presumptive), or suspected (possible).

Table VII-B. . Proposed table of criteria to determine whether a case is classified. Note: The following criteria are proposed for evaluation before general implementation. For purposes of current notification, the narrative description in VII-A, should be used.

	Case Definition								
Criterion	Confirmed				Probable	Suspected			
Clinical Presentation									
Parotitis Duration 2 days or more	O	O			O	O			
Swelling of sublingual or submandibular salivary glands 2 days or more	O	O			O	O			

Fever	C	C			C	C		
Aseptic meningitis			O	O			O	
Encephalitis			O	O			O	
Orchitis			O	O			O	
Oophoritis			O	O			O	
Mastitis			O	O			O	
Pancreatitis			O	O			O	
Acute onset hearing loss			O	O			O	
Laboratory findings								
Isolation of mumps virus from a clinical specimen	O		O		A	A	A	O
Positive PCR test for mumps-specific nucleic acid	O		O		A	A	A	O
Positive test for mumps IgM	O		O		A	A	A	O
4-fold rise in mumps IgG by quantitative assay	O		O		A	A	A	O
Conversion from negative to positive on standardized mumps serologic assay	O		O		A	A	A	O
Epidemiological risk factors								
Contact of a confirmed mumps case		O		O	O			
Member of a risk group defined by public health authorities during an outbreak.		O		O	O			
Mumps vaccination in past 4 weeks	A		A		A			A

Notes:
N = This criterion in conjunction with all other "N" and any "O" criteria in the same column is required to classify a case.
O = At least one of these "O" criteria in each category in the same column (e.g., clinical presentation and laboratory findings)—in conjunction with all other "N" criteria in the same column—is required to classify a case.
A = This criterion must be absent (i.e., NOT present) for the case to meet the reporting criteria or case definition.
C = This finding corroborates (i.e., supports) the diagnosis of—or is associated with—Mumps, but is not included in the case definition and is not required for reporting.

VIII. Period of Surveillance

Surveillance should be on-going.

IX. Data sharing/release and print criteria

Notification to CDC for confirmed and probable cases of mumps is recommended.

- Data reported to NCIRD staff is summarized weekly internally via an NCIRD weekly surveillance report for vaccine preventable diseases. Electronic reports of mumps cases in NNDSS are also summarized weekly in the MMWR Tables. Annual case data on mumps is also summarized in the yearly Summary of Notifiable Diseases. Cumulative data is used for Healthy People 2010 reviews.

- State-specific compiled data will continue to be published in the weekly and annual MMWR. In addition to those reports, the frequency of reports/feedback to the states and territories will be dependent on the current epidemiologic situation in the country. Frequency of cases, epidemiologic distribution, importation status, transmission risk, and other factors will influence frequency and method of communication and information feedback.

- State-specific compiled data will continue to be published in the weekly reports and annual MMWR Surveillance Summaries. Data are also included in PAHO and WHO annual reports. The frequency of release of additional publication of this data will be dependent on the current epidemiologic situation in the country. These publications might include annual epidemiologic summaries in the MMWR or manuscripts in peer-reviewed journals.

- We do not plan on re-releasing case data on mumps cases to WHO or other parties.

X. References

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