



Massachusetts Department of Public Health
Bureau of Infectious Disease and Laboratory Sciences

Investigating a Mumps Outbreak in Boston Area Universities January – August 2016 (Updated 1/2017)

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Summary

- Largest mumps outbreak in MA in 30+ years
 - **784** total investigations from January – December 2016
- Largely contained within university settings, with little spread into surrounding communities
- Transmission interrupted due to:
 - Enforcement of existing school requirements for immunization
 - Implementation of control measures, including social distancing
 - End of school year and school vacations

MA Investigations vs. Confirmed* Cases

	2014 Investigations	2014 Confirmed Cases	2015 Investigations	2015 Confirmed Cases
Diphtheria	4	0	5	0
Hepatitis A	231	39	170	34
Measles*	111	8	119	0
Mumps*	121	5	154	6
Polio	30	0	28	0
Rubella*	21	0	20	0
Pertussis	413	298	337	252
Totals	911	350	807	292

*Includes probable cases to more accurately reflect true burden of disease.

Confirmed and probable mumps cases in MA reported to CDC since 2006

Year	Cases in U.S.	Cases in MA
2006	6,584	10
2007	800	6
2008	454	7
2009	1,991	15
2010	2,612	9
2011	370	4
2012	229	6
2013	584	71
2014	1,223	5
2015	1,057*	6
2016	3,596**	249***

*Cases as of January 2, 2016. Case count is preliminary and subject to change.

**Cases as of November 30, 2016. Case count is preliminary and subject to change.

Source: [Morbidity and Mortality Weekly Report \(MMWR\), Notifiable Diseases and Mortality Tables](#)

*** Cases as of December 31, 2016

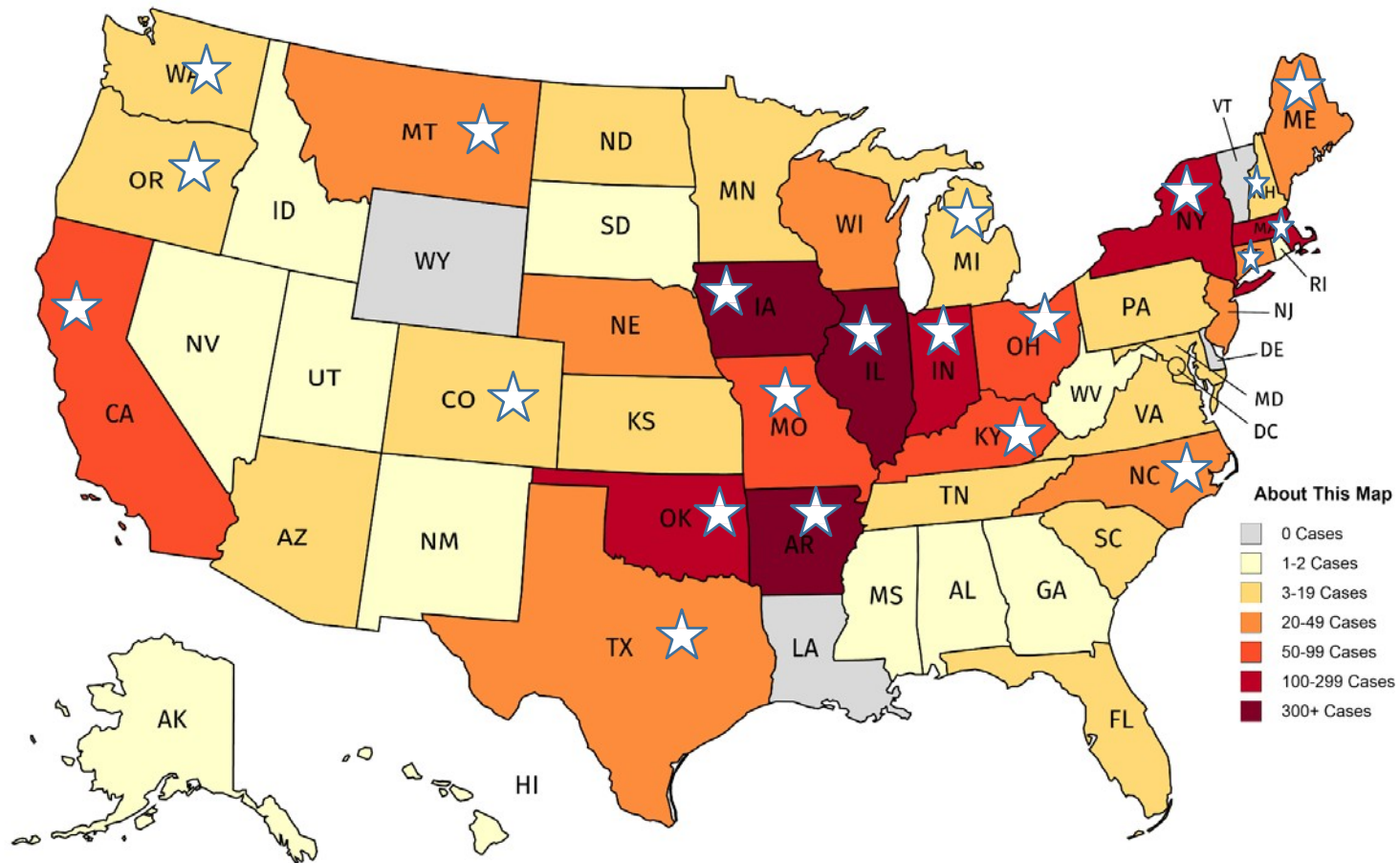
U.S. Mumps Cases, Jan-Nov, 2016

N = 3596 (preliminary data)

- Age range: >1 yr to 88 yrs old
 - Median age: 20 yrs
- 81% reported vaccination status (2909)
 - 88% (2570) vaccinated
 - 65% (1683) 2 or more doses
- 38 reported outbreaks (≥ 3 or more cases)
 - 19 in University settings
 - 5 in Marshallese communities
 - 12 ongoing as of the end of November 2016

NNDSS data, accessed November 30th, 2016, as reported by CDC

U.S. Mumps Cases and Outbreaks, Jan-Nov 2016



Created with mapchart.net ©

Source: CDC, 2016

MA Mumps Outbreak 2016

There are now 6 confirmed cases of mumps at Harvard University

Officials have asked the students to "self-isolate" for five days.

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- Initial notification on 2/24/16
- Clinical advisory issued on 3/2/16
- Emphasis on early recognition, prompt testing and **isolation of ill patient for five days after onset** of parotitis, and vaccination
- Mumps may occur in vaccinated individuals
- Two doses 88% effective (at best) in preventing mumps

MMR rates among MA college students, 2015-16 school year

	Undergraduates	Graduates	Health Science
Harvard	99.8%	98.8%	100%



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March 2, 2016

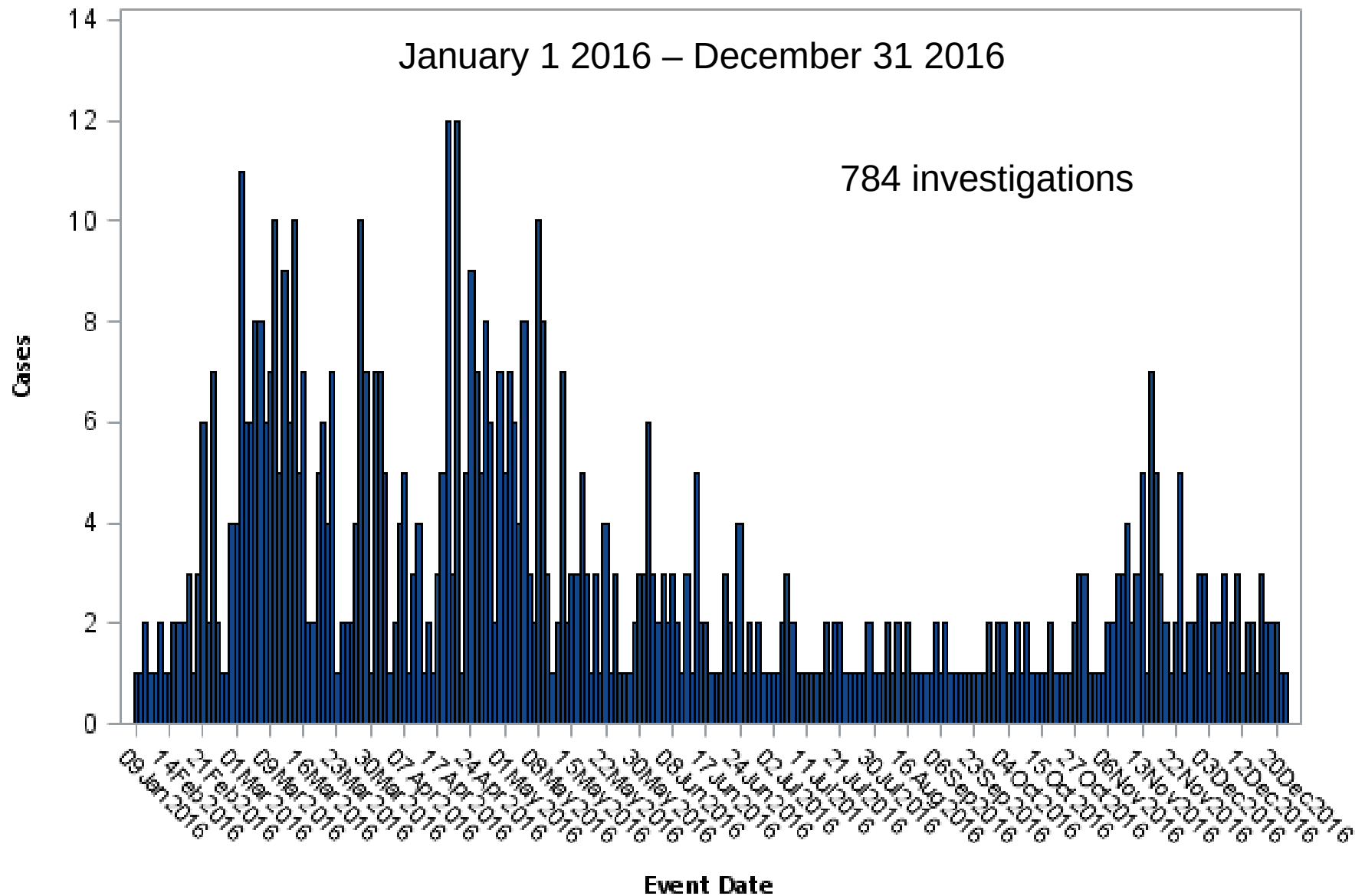
Clinical Advisory: Mumps

1. Consider a diagnosis of mumps in those with mumps symptoms, regardless of vaccination history.
2. Use droplet and standard precautions to prevent transmission.
3. Obtain appropriate clinical specimens for testing at the Massachusetts State Public Health Laboratory. A buccal swab is preferred for patients with recent onsets within five days of onset of swelling.
4. Isolate suspected and confirmed mumps cases for five days after onset of swelling.
5. Report suspected cases to MDPH at 617-983-6800. Cases diagnosed in Boston should be reported to the Boston Public Health Commission at 617-534-5611.
6. Vaccinate those without evidence of immunity to mumps and reach out to those with medical and religious exemptions.

Event Date of All Investigated Mumps Events

January 1 2016 – December 31 2016

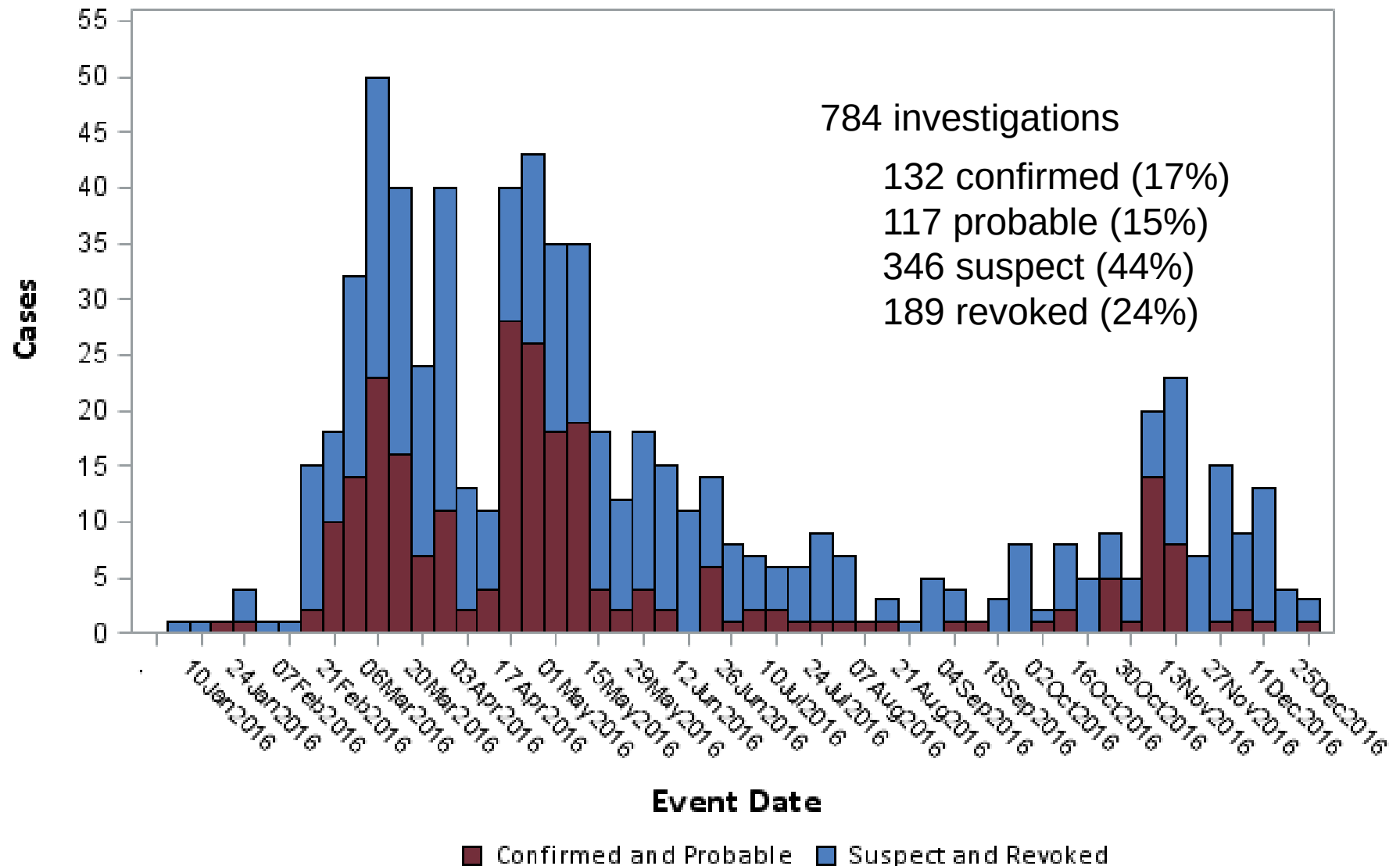
784 investigations



Data are preliminary and subject to change. (MDPH 2016)

Event Date of All Investigated Mumps Events by Week

January 1 2016 – December 31 2016



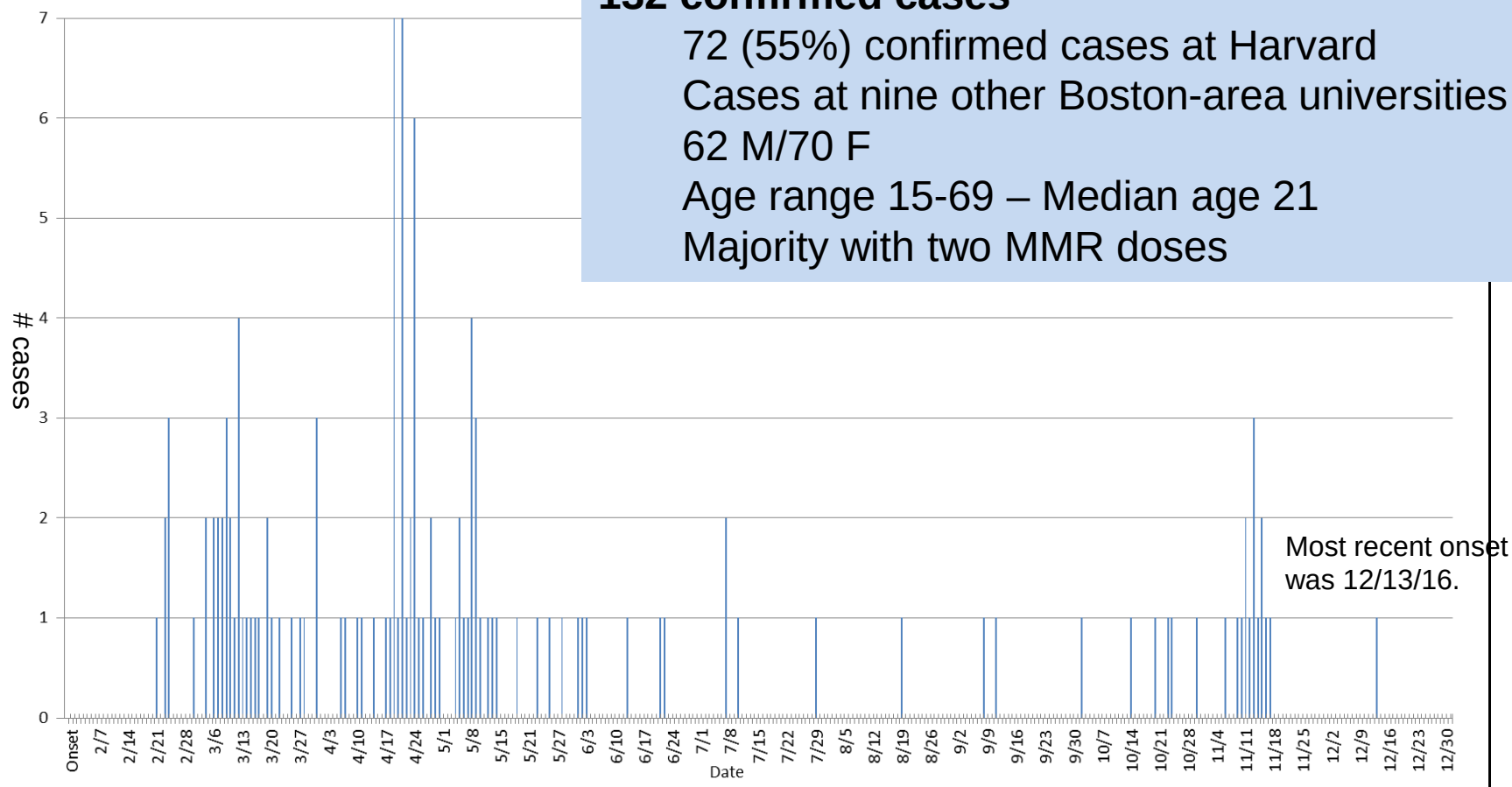
Data are preliminary and subject to change. (MDPH 2016)

Epi Curve – PCR-positive Mumps Cases

PCR-positive Mumps Cases in MA
by Onset of Parotitis
February 1 - December 31, 2016

132 confirmed cases

72 (55%) confirmed cases at Harvard
Cases at nine other Boston-area universities
62 M/70 F
Age range 15-69 – Median age 21
Majority with two MMR doses

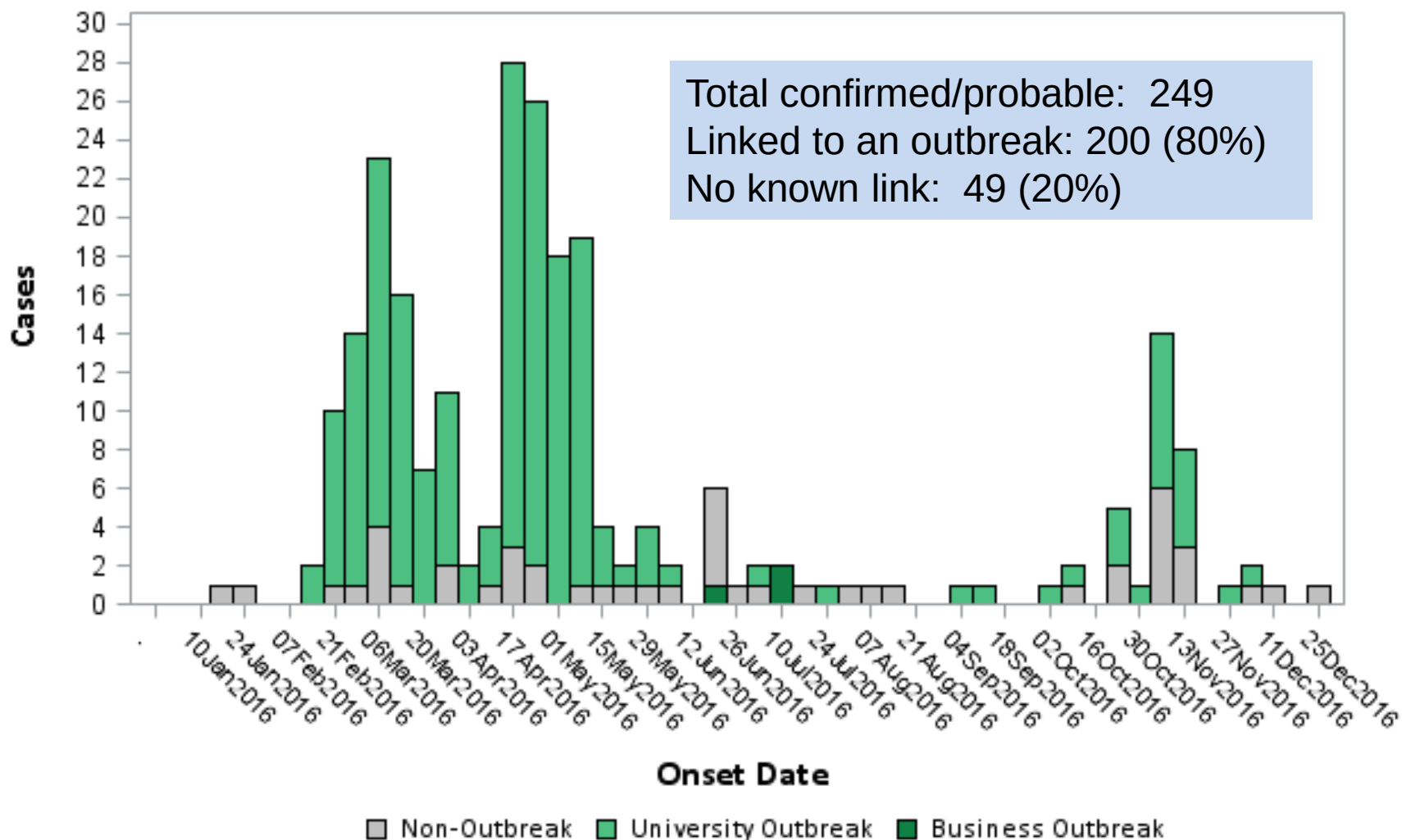


Most recent onset
was 12/13/16.

Onset of Parotitis among Confirmed and Probable Mumps Cases by Week

Outbreak Related vs Not Outbreak Related

January 1 – December 31, 2016



Data are preliminary and subject to change. (MDPH 2016)

Challenges

- Many causes of parotitis
- Mumps testing shortcomings
- Asymptomatic people may transmit mumps
- Vaccination not 100% effective
- Educating providers and LBOHs
- Isolation for five days, especially with negative test results
- Social distancing/college students

Recommendations

- Improve risk communication to target populations
- Develop comprehensive testing guidance for providers
- Ensure collection of key variables

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH Guide to Surveillance, Reporting and Control

Mumps

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Section 1

ABOUT THE DISEASE

A. Etiologic Agent

Mumps is caused by the mumps virus (genus *Paramyxovirus*, family *Paramyxoviridae*).

Note: Swelling of the salivary glands (parotitis) can also be caused by infection due to parainfluenza virus types 1 and 3, influenza A, Coxsackie A, echovirus, *Streptococcus aureus*, lymphocytic choriomeningitis virus, HIV, and noninfectious causes such as drugs (e.g., phenylbutazone, thioracil, iodides), tumors, starch ingestion, metabolic disorders (diabetes, cirrhosis, and malnutrition), immunologic diseases, and obstruction of the salivary duct. However, other infectious causes of parotitis do not cause epidemic parotitis.

B. Clinical Description

Mumps is a systemic disease characterized by swelling of one or more salivary glands, usually the parotid glands. Parotitis tends to occur early and may first be noted as an earache or pain on palpitation at the angle of the jaw. Symptoms tend to decrease after one week and usually resolve after ten days. Prodromal symptoms are non-specific and may include myalgia, anorexia, malaise, headache, and low-grade fever. Approximately one-third of infections do not cause clinically apparent salivary gland swelling and may be asymptomatic (subclinical) or may manifest primarily as respiratory tract infection. Orchitis (testicular inflammation) is the most common complication in postpubertal males.

In the prevaccine era, mumps accounted for approximately 10% of cases of symptomatic aseptic meningitis. In the post-vaccine era, among all persons infected with mumps, reported rates of meningitis, encephalitis, pancreatitis, and deafness have all been less than 1%. Encephalitis occurs rarely, and permanent sequelae such as paralysis, seizures, cranial nerve palsies, and hydrocephalus occur very rarely. Other rare complications include arthritis, thyroiditis, mastitis, glomerulonephritis, myocarditis, reticulocytopenia, cerebellar ataxia, and hemiparesis.

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Attachment One – Mumps Testing

Report suspect cases immediately

Mumps is immediately reportable in Massachusetts, whether suspected or confirmed. Call your local board of health and MDPH at 617/983-6800. Providers in Boston should contact the Boston Public Health Commission at 617/334-5611.

When to test for mumps:

A clinical diagnosis of mumps must be confirmed by laboratory testing. Consider lab testing for patients with symptoms consistent with mumps:

- Low-grade fever
- Swelling of one or more salivary glands, usually the parotid gland, and/or orchitis and
- A prodrome consisting of myalgias, loss of appetite, malaise, and/or headache

Patients with fever, swelling and contact to a known mumps case or outbreak should be given high priority for testing. Asymptomatic patients should not be tested for mumps.

Notes: Swelling of the salivary glands (parotitis) can also be caused by infection due to parainfluenza virus types 1 and 3, influenza A, Coxsackie A, echovirus, *Streptococcus aureus*, lymphocytic choriomeningitis virus, HIV, and noninfectious causes such as drugs (e.g., phenylbutazone, thioracil, iodides), tumors, starch ingestion, metabolic disorders (diabetes, cirrhosis, and malnutrition), immunologic diseases, and obstruction of the salivary duct. Consider testing for these other causes of parotitis.

Isolate the patient:

Mask and isolate the suspect patient as much as possible and consolidate care using standard and droplet precautions. Clinicians should also be masked. Suspected cases of mumps should be asked to refrain from all public activities for five days following onset of swelling.

What specimens should be collected?

In general, when mumps is suspected, MDPH recommends the collection of serum for mumps.

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October 6, 2016

TO: Student Health and Emergency Preparedness Personnel
Boston Consortium for Higher Education

FROM: Susan Lett, MD, MPH
Medical Director, Massachusetts Immunization Program

RE: Mumps Update for Higher Education Student Health Services

As you know, an outbreak of mumps occurred during the spring of 2016 in Massachusetts, primarily among vaccinated college students. MDPH and partners at local boards of health, particularly Cambridge Health Alliance and Boston Public Health Commission, investigated 617 suspected cases of mumps from January through August, 2016. This is four times the number of mumps cases that are investigated during a normal year. Boston area colleges and universities responded to this outbreak with grit and determination, using creative means and resources for isolating suspected cases of mumps, and discouraging activities which can spread mumps. Thank you for your efforts to control this unusual outbreak.

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Lieutenant Governor

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Thank You!

- Vaccine preventable disease epidemiology team
 - Special thanks to Christina Brandeburg
- Susan Lett, Immunization Program Medical Director
- Sandy Smole, Virology Lab Director and staff
- Dr. Manisha Patel, CDC
- Cambridge Public Health Department
- Boston Public Health Commission
- Sue Fitzgerald and staff at “University A”