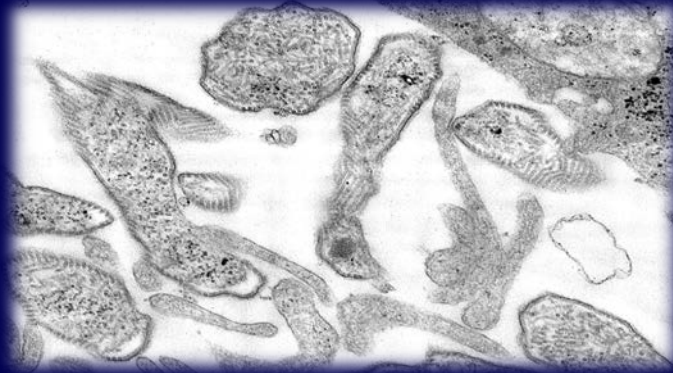


# Mumps Epidemiology and Public Health Response in Minnesota



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MDH

# Mumps

- RNA virus in *Paramyxoviridae* family
- Incubation period typically 16-18 days (12-25 days)
- Treatment is supportive
- Infectious 2 days before through 5 days after parotitis
- Transmission- respiratory droplets, contact with fomites
- Mumps vaccine and Ig not protective after exposure

# Mumps (cont.)

- Mumps still endemic in U.S.
- Occurs year-round, but peaks late winter and spring
- Surveillance challenged by:
  - Nonspecific symptoms that mimic other diseases and conditions
    - Parotitis can be due to other viruses, infections, drug reactions, tumors, inflammatory disorders
  - Transmission can occur with subclinical infection
  - Issues with lab testing
- Rapid spread among individuals living in close quarters

# Clinical Presentation

- Prodrome: low-grade fever, malaise, headache, muscle aches, loss of appetite, fatigue
- Parotitis frequent manifestation, swelling is usually tender, unilateral or bilateral
- Nonspecific symptoms or no symptoms in up to 30% of cases
- Complications more common post-puberty, adults



# Mumps Lab Testing

- PCR preferred
  - Specimens for PCR should be collected as soon as possible after swelling onset (maximum 9 days after onset)
  - Buccal swab is preferred
- Serology (IgM) for mumps
  - Do in conjunction with PCR
  - False positives are common
- False negatives in previously vaccinated individuals may occur for both IgM and PCR

# Mumps Vaccine

- MMR vaccine: 2 doses routinely recommended at 12-15 months and 4-6 years
- Adults not at high risk: 1 dose
- Adults at high risk: college students, international travelers, healthcare workers: 2 doses
- Mumps vaccine effectiveness:
  - 1 dose 78% (range 49%-91%)
  - 2 doses 88% (range 66%-95%)

# Vaccine Effectiveness

Example of vaccine effectiveness of 90%

- Exposure among 1,000 people: 44 cases of mumps
- 95% vaccine coverage (950 received 2 doses of vaccine and 50 are unvaccinated)
- 30% attack rate among unvaccinated, 15 get mumps
- 3% attack rate among vaccinated, 29 get mumps
- If none of the 1,000 people had been vaccinated, the outbreak would have resulted in 300 cases

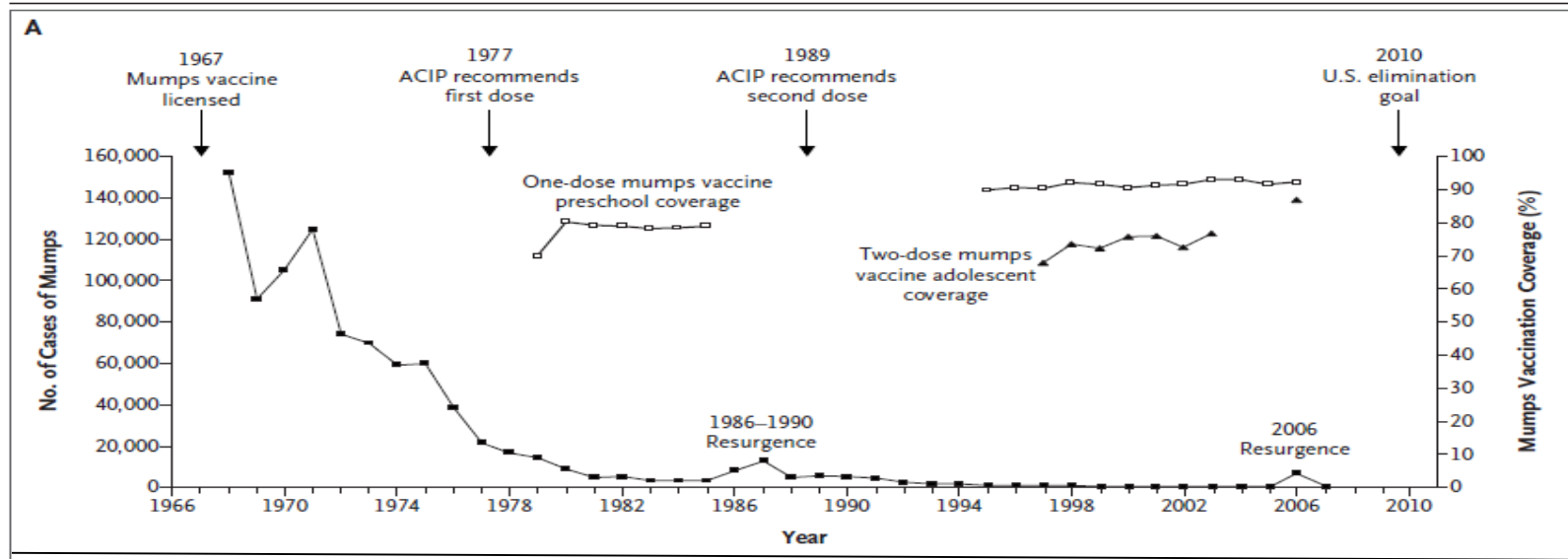
# Epidemiology

- Pre-vaccine in US (<1967) 186,000 reported cases/year in US (many additional not reported)
  - Orchitis in 12-66% of cases, oophritis 5%
  - CNS: aseptic meningitis (1-10%; however accounted for 10% of symptomatic aseptic meningitis cases), encephalitis (0.2%-0.3%)
  - Pancreatitis (3.5%), deafness (transient 4%, permanent unilateral 0.005%), death 0.02%
- Subsequently >99% decrease in cases
  - Orchitis 3-10%, oophritis/mastitis  $\leq 1\%$ , pancreatitis, deafness, encephalitis very rare



# Epidemiology (cont.)

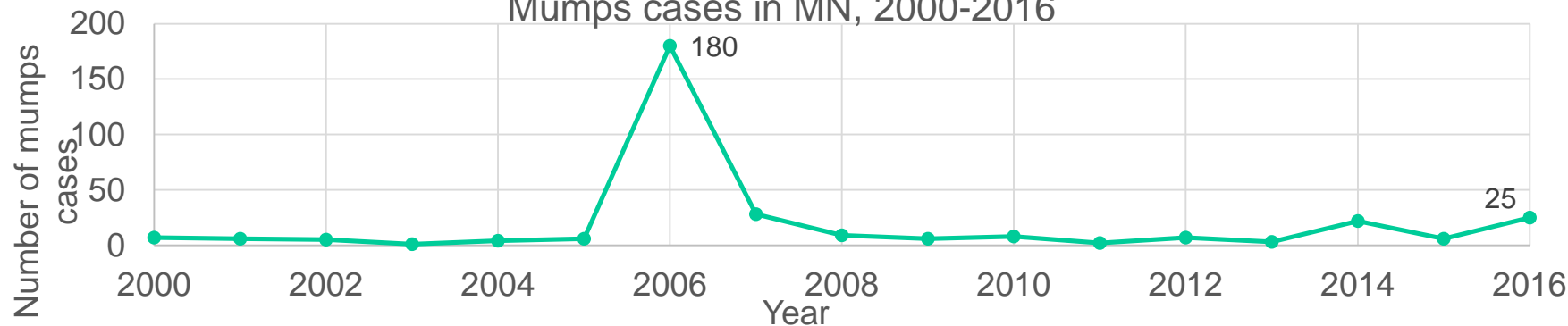
The NEW ENGLAND JOURNAL of MEDICINE



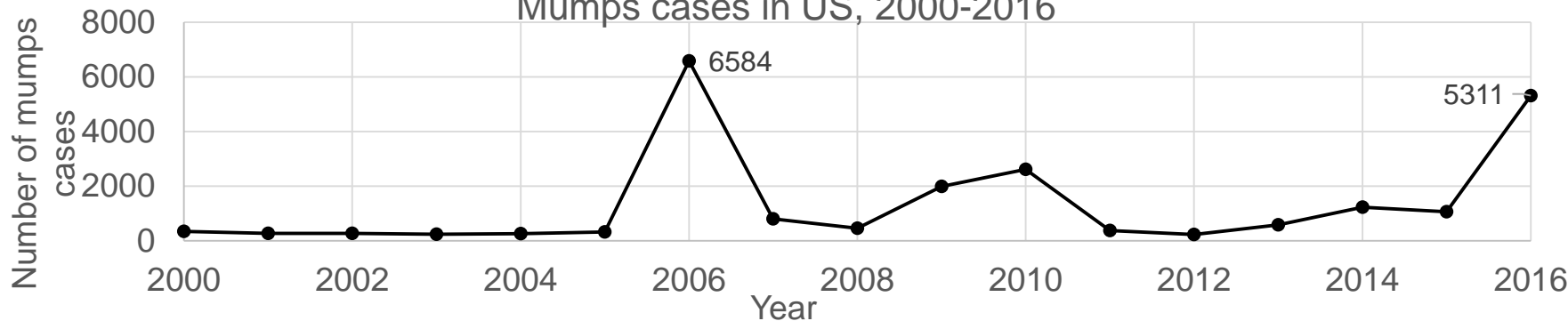
NEJM; 2008;358:  
1580-1589

# Mumps in MN and the US, 2000-2016

Mumps cases in MN, 2000-2016



Mumps cases in US, 2000-2016



# Minnesota Mumps 2016 (n=25)

- Median age 35 years(16-53 years); 17 (68%) male
- 24 parotitis (15 bilateral, 9 unilateral)
- 3 orchitis
- 2 hospitalizations
- Vaccination status:
  - 2 doses (3)
  - 1 dose (1)
  - Undocumented/states vaccinated (18)
  - Unknown (3)

# MN Mumps Cases (cont.)

- Exposure:
  - 1 international travel
  - 2 out of state
  - 3 epi links/household contacts
- Association with colleges/universities among MN cases:
  - 4 cases, 3 colleges
- 6 out of state college cases in MN residents (counted in state where attend college; not included in the 25):
  - 4 IA, 1 WI, 1 MO

# Case Identification and Follow-up

- MN Dept. of Health tests 200-300 suspect cases/year
- Rule in/out typically takes 1-3 days
- Suspect case identification:
  - Lab result faxed/mailed; reported electronically
  - Health care provider submits report
  - Call from public about exposure to mumps
- Get information from health care provider, coordinate lab testing, communicate with multiple individuals (parents, school, providers, etc.)
- Interpretation of lab results

# Case Investigation (cont.)

- Once a case is classified as probable or confirmed a case investigation occurs; typically 1-5 days/case
- Main objectives
  - Identify source and assess potential for spread (activity history for 25 days prior to symptom onset)
  - Identify susceptible close contacts or large gatherings in which transmission may have occurred
  - Provide/facilitate notification for activities in which there were exposures
- May need to develop health advisory; work with media

**From:** EPIXupdate@cdc.gov  
**Subject:** Important: Potential Exposure to Mumps at a Minnesota Wrestling Tournament -- Minnesota, 2016  
**Date:** Friday, January 13, 2017 3:55:32 PM

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**Epi-X** *The Epidemic  
Information Exchange*

Check Epi-X for an Urgent Report

Potential Exposure to Mumps at a Minnesota Wrestling Tournament -- Minnesota, 2016

A case of mumps has been reported in an individual who participated in "The Clash XV", a wrestling tournament in Rochester, MN on December 30-31, 2016. Teams from 16 states participated in the event, and wrestlers from four states had direct contact with the case and will be notified separately.

<https://epix2.cdc.gov/v2/Reports/Display.aspx?id=61612>



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2016



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