2016 Mumps Outbreak in Nebraska

NEBRASKA
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DEPT. OF HEALTH AND HUMAN SERVICES

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Introduction

- Mumps is an acute viral infection that generally manifests as mild symptoms such as parotitis (swollen salivary glands on one or both sides of the face), headache, fatigue, muscle aches, and/or loss of appetite.

Source: winnipeg.ctvnews.ca

- In rare instances it can cause complications including encephalitis, meningitis, deafness, or inflammation of the testicles, ovaries, or breasts.
- While still endemic in developing countries, the MMR vaccine drastically reduced the incidence of mumps in the United States from around 186,000 in 1967 to 1,057 reported cases in 2015.
- As of August 13, 40 states have reported mumps cases in 2016 and four states (IA, IN, IL, and MA) have over 100 cases (figure 1). Most recent outbreaks have occurred on college campuses.
- The Nebraska outbreak (*n*=43) began at a university in Dodge County and later spread to other parts of the state (figure 2). Median age was 22 years old and 51% of cases were female.
- 5 generations of transmission: Index case brought from spring break, spread to close contacts, then community, and lasted 3 generations at a summer camp in Saunders County (figure 3).
- MMR vaccine effectiveness against mumps has been estimated to be 78% after 1 dose and 88% after 2 doses (Mumps, 2015).
- The mumps vaccine does not induce lifelong immunity. Date et al. (2008) found that 97% of young adults were seropositive within 5 years of 2nd MMR, but only 58% were seropositive after 15 years.

Methods

- Cases were reported to local and state health departments from hospitals, clinics, university health centers, and summer camps.
- Serology (IgM), PCR, and further genotyping (finding mumps genotype G) were the testing methods used to confirm cases.
- CDC case definition used:
  - **Confirmed case**: Clinically compatible symptoms and isolation of mumps virus through PCR or culture test.
  - **Probable case**: Clinically compatible symptoms and
  - positive IgM serology test or epi-link to known case/group.
  - **Suspect case**: Clinically compatible symptoms without positive lab test or known epi-link (not included in case count) (Mumps, 2015).
- Public health action involved recommending cases to isolate for at least 5 days, alerting health care providers and the public, and recommending a 3rd MMR dose at 2 summer camps.

Results

Figure 1. National frequency of Mumps in 2016 (January-August).

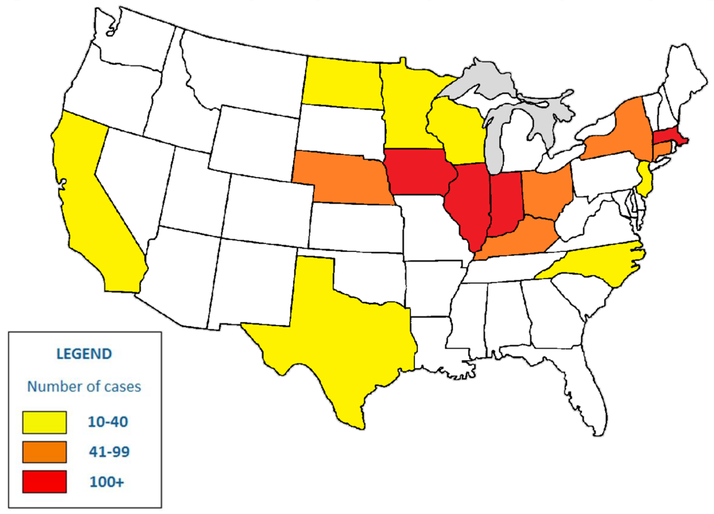


Figure 2. Statewide frequency of mumps during outbreak.

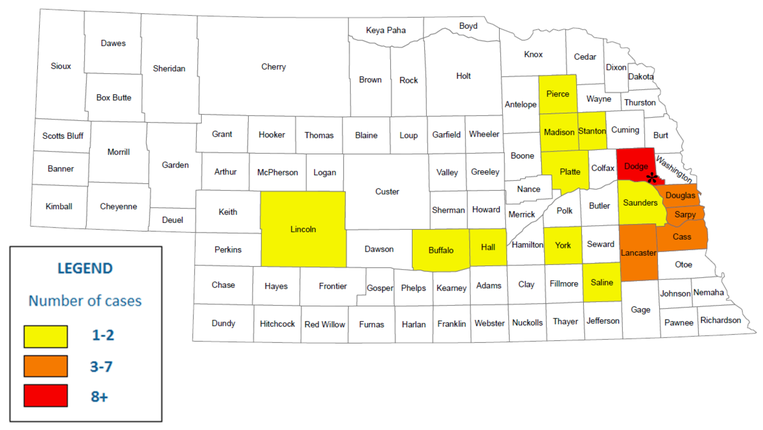


Figure 3. Cases of Mumps by symptom onset (April-July, 2016).

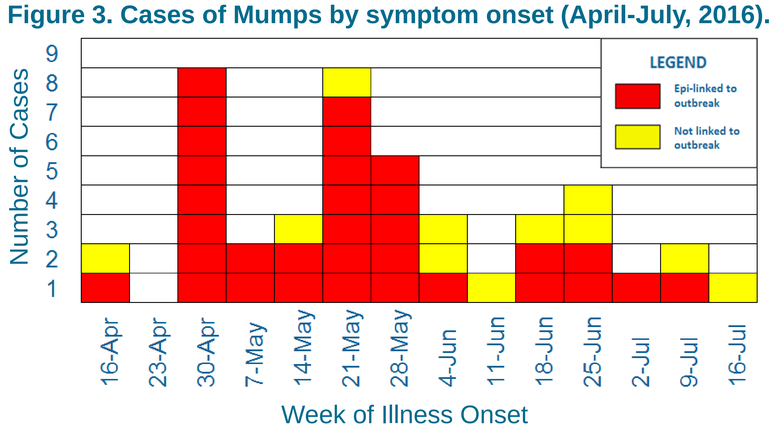
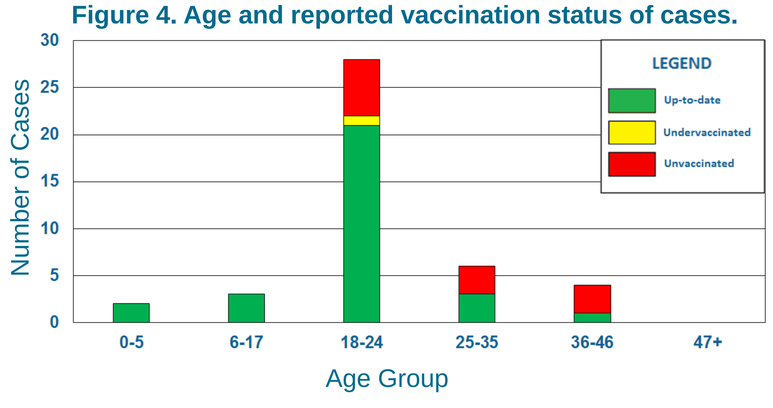


Figure 4. Age and reported vaccination status of cases.



Conclusions

- 70% of cases reported being up to date with the vaccination schedule and 49% have MMR records in the Nebraska State Immunization Information System (NESIIS) (figure 4).
- Best explanation for breakthrough disease implicates waning immunity, close living environments of college-aged individuals, and a possibility that MMR vaccines provide less protection against mumps genotype G (Dayan et al., 2008).
- A 3rd dose of MMR is not routinely recommended but CDC has guidelines for considering its application. During this outbreak, two vaccination campaigns were organized with 471 booster doses provided to participants at two summer camps.
- **Lessons learned and implications for public health practice:** 3rd dose of MMR did not prevent the infection of two camp counselors who received a booster dose before being exposed.
- Further research is needed to assess the MMR vaccine's effectiveness against mumps genotype G and the utility of providing a 3rd MMR dose during outbreaks.

References

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