

# Unprotected People #83

## Mumps

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### **Mumps outbreak at a summer camp demonstrates the need for vigilance against all vaccine-preventable diseases**

*This report describes an outbreak of mumps in a camp setting where the virus likely was introduced by an unvaccinated counselor from the United Kingdom, where an epidemic of mumps was ongoing. The outbreak resulted from a combination of delay in diagnosis of mumps and failure to report the cluster of illnesses in a timely manner, in addition to close contact among camp participants.*

*With the decrease in mumps incidence in the United States, healthcare providers have become less likely to suspect mumps in patients with parotitis. In this camp outbreak, although patients were evaluated by multiple healthcare providers, including camp and hospital physicians, parotitis was not recognized as mumps until well into the outbreak. Providers, parents, and child care and school staff members need to be aware of mumps signs and symptoms, potential complications, and communicability and the need to suspect mumps regardless of patient vaccination status.*

*A second lesson from this outbreak is the need for organizations assigning foreign staff to U.S. camps to begin revising their admission requirements to include immunity to vaccine-preventable diseases such as mumps.*

*CDC published "Mumps Outbreak at a Summer Camp—New York, 2005" in the February 24 issue of MMWR. It was reported by K. Henry, Sullivan County Health Department; L. Pollock, MSN, C. Schulte, D. Blog, MD, P. Smith, MD, New York State Department of Health; G. Dayan, MD, National Immunization Program; J. Schaffzin, MD, EIS Officer, CDC. The findings in the report are based, in part, on contributions from staff of the New York State Department of Health Immunization Program; and from C. LeBaron, MD, National Immunization Program, and L. Lowe and N. Williams, National*

*Center for Infectious Diseases, CDC. It is reprinted below in its entirety, excluding references.*

### **Mumps Outbreak at a Summer Camp—New York, 2005**

On July 26, 2005, the Sullivan County Health Department (SCHD) and the New York State Department of Health (NYSDOH) were notified of a cluster of cases of parotitis among campers and staff members at a summer camp. An investigation conducted by NYSDOH identified 31 cases of mumps, likely introduced by a camp counselor who had traveled from the United Kingdom (UK) and had not been vaccinated for mumps. This report summarizes the results of the subsequent investigation by NYSDOH, which determined that, even in a population with 96% vaccination coverage, as was the case with participants in the summer camp, a mumps outbreak can result from exposure to virus imported from a country with an ongoing mumps epidemic.

Camp was in session during June 28–August 18. A case of mumps was defined as unilateral or bilateral parotitis of [more than] 2 days' duration with no other apparent cause in a camper or staff member who was examined during June 30–September 1, 2005. Among 541 campers and staff members, 31 cases of mumps were identified (attack rate: 5.7%), with illness onsets during June 30–August 9. The index patient was a man aged 20 years who resided in the UK and who had not been vaccinated for mumps. The man came to the United States on June 19 to work as a counselor at the camp; on June 30, he had left-sided parotitis, sore throat, and a low-grade fever. However, mumps was not considered as a diagnosis by healthcare staff members at the infirmary.

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The patient was not isolated and continued to work among the camp population. During July 15–23, a total of 25 additional cases of parotitis were identified, consistent with exposure beginning June 28. However, the diagnosis of mumps was not made by members of the healthcare staff at the infirmary or by community healthcare providers for any patient with parotitis until July 24. SCHD and NYSDOH were alerted to a possible outbreak on July 26, and diagnosis of mumps for the first 23 (74%) cases was made via retrospective chart review by NYSDOH on July 27. At that time, five (16%) patients were either symptomatic or in isolation. Subsequently, an additional three (10%) cases were identified, beginning on August 2.

Of the 31 mumps cases identified, 17 (55%) were in females. All patients had parotitis, 24 (77%) had jaw pain, and eight (26%) had bilateral disease. Four male patients had unilateral orchitis; all recovered spontaneously. Specimens for serology and viral culture/nucleic acid detection (i.e., nasopharyngeal swabs and urine) were obtained from six patients. All six serologic specimens tested positive for mumps-specific IgM; however, no virus was successfully amplified or cultured from any clinical specimen.

Twelve (39%) of the 31 mumps cases were among campers. All were U.S. residents aged 10–15 years who had been vaccinated with 2 doses of measles, mumps, and rubella (MMR) vaccine after the first birthday. Nineteen (61%) of the mumps cases were among staff members; of these, nine (47%) were UK residents, five (26%) were U.S. residents, three (16%) were residents of Australia, and two (11%) were residents of Germany. Staff members with mumps ranged in age from 19 to 41 years (median: 21 years). Of the 17 staff members with mumps for whom vaccination history could be obtained by vaccination or medical record, nine (53%) had not been vaccinated for mumps, four (24%) had been vaccinated with 1 dose, and four (24%) had been vaccinated with 2 doses of a mumps-containing vaccine. Symptoms, illness duration, and complications (e.g., orchitis) did not differ

substantially between vaccinated and unvaccinated patients.

Outbreak-control measures were instituted at the camp immediately after SCHD and NYSDOH were notified on July 26. Persons exhibiting signs or symptoms of mumps were isolated from other campers and staff members for 9 days after onset of symptoms. A total of 513 persons who were neither known to have mumps nor symptomatic for mumps were quarantined to the grounds of the camp; these persons were not permitted to enter or leave the camp until their mumps immunity status had been verified. Mumps immunity was assessed in accordance with Advisory Committee on Immunization Practices (ACIP) criteria as follows: (1) birth before 1957, (2) history of physician-diagnosed mumps before arriving at camp, (3) laboratory evidence of mumps immunity (i.e., positive for mumps-specific IgG), or (4) receipt of 1 dose of a mumps-containing vaccine on or after the first birthday, as documented by a healthcare provider. Twenty persons who could not verify their vaccination status and did not meet any other immunity criteria had their sera tested for mumps-specific IgG.

A total of 73 persons without immunity or with a record of 1 dose of mumps-containing vaccine were administered MMR vaccine. Mumps information was provided to camp personnel, and alerts were distributed to healthcare providers statewide. Letters from NYSDOH, written in collaboration with the camp operators, were sent to the parents of campers and directors of other New York camps. After August 9, 2005, no further reports of mumps disease were received at the camp, in the county where the camp was located, or in any U.S. counties of origin for campers and staff members.

### **Editorial Note**

Mumps generally is a mild and self-limited viral infection; an estimated 15%–20% of infections are asymptomatic. However, infections occasionally can lead to serious complications, with or without parotitis. Meningitis occurs in an estimated 15% of

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cases, of which a small percentage can progress to encephalitis and permanent central nervous system sequelae; pancreatitis is observed in approximately 4% of cases and sensorineural deafness in an estimated one in 20,000 cases. First-trimester mumps infection in pregnant women is associated with a 25% incidence of spontaneous abortion. In addition, mumps causes orchitis in approximately 40% of postpubertal males, with infertility as a rare consequence. The number of mumps cases reported annually in the United States ranged from 231 to 277 cases during 2001–2005. However, mumps remains endemic in many countries throughout the world, and mumps vaccine is used in only 57% of World Health Organization member-countries, predominantly in countries with more developed economies.

Mumps vaccine was first licensed in the United States in 1967; vaccination with at least 1 dose of mumps-containing vaccine has been required for school entry in New York since 1986. MMR vaccination coverage in the United States has been estimated at [more than] 90% among children aged 19–35 months since 1994. During 2004–2005, estimates of immunity to mumps in New York, according to ACIP criteria, were 96% in schools and 98% in post-secondary institutions.

Previous investigations of mumps outbreaks reported similar clinical symptoms among vaccinated and unvaccinated patients. With the decrease in mumps incidence in the United States, healthcare providers have become less likely to suspect mumps in patients with parotitis. In the camp outbreak, although patients were evaluated by multiple healthcare providers, including camp and hospital physicians, parotitis was not recognized as mumps until well into the outbreak. Providers, parents, and child-care and school staff members need to be aware of mumps signs and symptoms, potential

complications, and communicability and the need to suspect mumps regardless of patient vaccination status. In addition, given the low prevalence of mumps in the U.S. population, laboratory confirmation should be encouraged to diagnose mumps accurately.

In the camp outbreak, mumps likely was introduced by an unvaccinated counselor who traveled from the UK, where an epidemic of mumps was ongoing, with 56,390 notified cases reported during 2005 in England and Wales. The likelihood of disease in U.S. residents as a result of imported virus from areas with mumps epidemics remains high. Vaccination of counselors who will be working in summer camps is recommended, particularly because mumps vaccine effectiveness can be [less than] 85% in outbreak settings. As a result of this outbreak, agencies involved in assigning foreign staff to U.S. camps and organizations of camp administrators have begun revising their admission requirements to include immunity to vaccine-preventable diseases such as mumps.

The outbreak described in this report likely resulted from a combination of delay in diagnosis of mumps and failure to report the cluster of illnesses in a timely manner, in addition to close contact and social mixing among camp participants. Controlling the outbreak resulted in a substantial burden on the camp and its staff, including cancellation of activities and likely loss of revenue. Previous mumps outbreaks also have carried substantial burden, particularly with respect to costs associated with school absenteeism. To prevent large outbreaks of mumps in their communities, U.S. healthcare providers should suspect mumps independent of vaccination history, diagnose mumps by using laboratory testing, and report mumps immediately to local health authorities.