



## Mumps Epidemic— Iowa, 2006

MMWR. 2006;55:366-368

2 figures omitted

ON MARCH 30, THIS REPORT WAS POSTED as an MMWR Dispatch on the MMWR website (<http://www.cdc.gov/mmwr>).

In the United States, since 2001, an average of 265 mumps cases (range: 231-293 cases) have been reported each year,\* and in Iowa, an average of five cases have been reported annually since 1996.† However, in 2006, by March 28, a total of 219 mumps cases‡ had been reported in Iowa, and an additional 14 persons with clinically compatible symptoms were being investigated in three neighboring states (11 in Illinois, two in Nebraska, and one in Minnesota) in what has become the largest epidemic of mumps in the United States since 1988.<sup>1</sup> This report summarizes and characterizes the ongoing mumps epidemic in Iowa, the public health response, and recommendations for preventing further transmission.

Mumps is an acute viral infection characterized by fever and nonsuppurative swelling of the salivary glands; an estimated 20%-30% of cases are asymptomatic. Complications can include inflammation of the testicles or ovaries, meningitis/encephalitis, spontaneous abortion, and deafness. During the prevaccine era, nearly everyone in the United States experienced mumps, and 90% of cases occurred among children aged <15 years. In 1977, Iowa law mandated 1 dose of measles, mumps, and rubella (MMR) vaccine for entry to public schools; in 1991, the mandate became 2 doses. For the 2004-05 school year, 97% of children entering school in Iowa had received 2 doses of MMR vaccine.<sup>2</sup>

The first reports to the Iowa Department of Public Health (IDPH) of

mumps-like illness occurred in December 2005 at a university in eastern Iowa, where several students with glandular swelling were tested; two tested positive for mumps-specific IgM antibodies. In mid-January 2006, an isolate from an unrelated patient was cultured and identified as mumps virus at the University Hygienic Laboratory (Iowa's state public health laboratory). Viral isolates were sent to CDC, and the mumps strain was identified as genotype G. By mid-February, active surveillance had been initiated in seven geographic areas, including the campuses of the three largest universities in Iowa.

Of the 219 cases reported in Iowa, the median patient age was 21 years (range: 3-85 years), with 48% of patients aged 17-25 years; 30% (34 of 114) were known to be college students. Of the 133 patients with investigated vaccine history, 87 (65%) had documentation of receiving 2 doses, 19 (14%) 1 dose, and eight (6%) no doses; vaccine status could not be documented in 19 (14%) patients. Among the 114 patients for whom symptomatic information was available, the most common symptoms were parotitis in 94 (83%) patients, submaxillary/sublingual gland swelling in 46 (40%), fever in 41 (36%), and sore throat in 36 (32%); average duration of illness was 5.1 days. Six (5%) patients reported complications (e.g., orchitis); one suspected case of encephalitis is being investigated. As of March 28, 2006, investigators had determined that only 36 (16%) of the 219 cases were linked epidemiologically (i.e., a source of infection was identified), suggesting frequent unapparent transmission.

The source of the Iowa epidemic is unknown; however, the United Kingdom (UK) experienced a recent mumps epidemic that peaked during 2005 with approximately 56,000 cases and a high attack rate among young adults.<sup>3</sup> The mumps strain in the UK epidemic also was identified as genotype G,<sup>4</sup> and the

UK epidemic has been linked to a 2005 mumps outbreak in the United States.<sup>5</sup>

To educate health-care professionals in Iowa regarding the epidemic and mumps, information has been distributed via Iowa's Health Alert Network (HAN), in weekly electronic newsletters, and via frequent conference calls. The IDPH website§ has provided bi-weekly updates, county case counts, fact sheets, and guidance to local health departments and health-care facilities on case investigations. IDPH recommendations include (1) requesting at least 5 days of isolation for all patients (quarantine is not being used), (2) ensuring that students and staff members on all Iowa college campuses have had 2 doses of MMR or are immune from mumps,<sup>6</sup> (3) assessing vaccination status of all health-care professionals in Iowa and offering vaccination where appropriate,<sup>7</sup> and (4) sending all specimens collected from possible cases to University Hygienic Laboratory for testing.

Despite control efforts and a highly vaccinated population, this epidemic has spread across Iowa and potentially to neighboring states. Ongoing investigations will focus on identifying actual vaccine coverage on college campuses, potential modes of mumps transmission, and the effectiveness of 1 or 2 doses of MMR.

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\*Data available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5511md.htm#tab1>.

†Data available at <http://www.idph.state.ia.us/adper/common/pdf/cade/decades.pdf>.

‡Includes 150 confirmed, nine probable, and 60 suspect cases. Case definitions were modified from Council of State and Territorial Epidemiologists/CDC mumps case definitions for use in this outbreak. *Confirmed*: case that meets the clinical case definition (i.e., unilateral or bilateral tender, self-limited, swelling of the parotid or other salivary gland, lasting >2 days and without other apparent cause) and is laboratory confirmed (i.e., by a positive IgM test result or positive viral culture) or epidemiologically linked to a confirmed case. A confirmed case can be asymptomatic if a mumps viral culture is positive. *Probable*: case that meets the clinical case definition but has noncontributory or no serologic or virologic testing and is not epidemiologically linked to a confirmed or probable case. *Suspect*: case with a positive IgM test result but no confirmation of the clinical definition.

§Available at <http://www.idph.state.ia.us>.

## Emergence of *Mycobacterium tuberculosis* With Extensive Resistance to Second-Line Drugs—Worldwide, 2000-2004

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DURING THE 1990s, MULTIDRUG-resistant (MDR) tuberculosis (TB), defined as resistance to at least isoniazid and rifampin, emerged as a threat to TB control, both in the United States<sup>1</sup> and worldwide.<sup>2</sup> MDR TB treatment requires the use of second-line drugs (SLDs) that are less effective, more toxic, and costlier than first-line isoniazid- and rifampin-based regimens.<sup>3</sup> In 2000, the Stop TB Partnership's Green Light Committee was created to increase access to SLDs worldwide while ensuring their proper use to prevent increased drug resistance. While assisting MDR TB treat-

ment programs worldwide, the committee encountered reports of multiple cases of TB with resistance to virtually all SLDs. To assess the frequency and distribution of extensively drug-resistant (XDR) TB cases,\* CDC and the World Health Organization (WHO) surveyed an international network of TB laboratories. This report summarizes the results of that survey, which determined that, during 2000-2004, of 17,690 TB isolates, 20% were MDR and 2% were XDR. In addition, population-based data on drug susceptibility of TB isolates were obtained from the United States (for 1993-2004), Latvia (for 2000-2002), and South Korea (for 2004), where 4%, 19%, and 15% of MDR TB cases, respectively, were XDR. XDR TB has emerged worldwide as a threat to public health and TB control, raising concerns of a future epidemic of virtually untreatable TB. New anti-TB drug regimens, better diagnostic tests, and international standards for SLD-susceptibility testing are needed for effective detection and treatment of drug-resistant TB.

During November 2004–November 2005, CDC and WHO surveyed the WHO/International Union Against Tuberculosis and Lung Disease Global Supranational TB Reference Laboratory (SRL) Network. The SRL Network consists of 25 reference laboratories on six continents that collaborate with national reference laboratories (NRLs) to increase culture and drug-susceptibility testing capacity and provide quality control for global surveys to assess anti-TB drug resistance.<sup>4</sup> All SRL directors were invited to participate in this survey, but not all SRLs test for susceptibility to SLDs, and certain laboratories test for only one or two SLDs. In addition, SRLs use different (but generally accepted) media and methods to test for SLD susceptibility. Using a standardized reporting form, CDC and WHO requested anonymous, individual-level data on all isolates tested for susceptibility to at least three SLD classes during 2000-2004 and maintained in a computerized registry. SRLs receive varying proportions of isolates from countries for surveillance, diag-

nosis, and quality assurance. Thus, SLD-susceptibility data from SRLs are based on a convenience sample and are not population-based, with one exception: South Korea's NRL routinely performs an extended diagnostic panel of drug-susceptibility testing of isolates from all culture-positive TB patients in South Korea. To complement the SRL survey, additional population-based data were analyzed from (1) the U.S. national TB surveillance system, which contains data on all reported TB cases during 1993-2004, and (2) Latvia's national MDR TB registry from the 2000-2002 cohort of MDR TB patients.

The study sample for the SRL analysis consisted of 17,690 isolates from the period 2000-2004 that were tested for susceptibility to at least three of the six SLD classes. Of these, 11,939 were from South Korea, of which 1,298 (11%) were MDR. From the other SRLs, 2,222 (39%) of 5,751 isolates were MDR. Of the 3,520 MDR isolates, 347 (10%) were XDR, including 200 (15%) of 1,298 from South Korea and 147 (7%) of 2,222 from other SRLs. The drug-susceptibility testing results were tabulated by year and geographic region (on the basis of the country of origin of the isolates). XDR TB was identified in all regions but was most common in South Korea (n=200; 15% of all MDR TB isolates) and countries of eastern Europe/western Asia† (n=55; 14% of all MDR TB isolates). The total number and proportion of XDR TB isolates observed worldwide (excluding South Korea) increased from 14 (5% of MDR TB isolates) in 2000 to 34 (7% of MDR TB isolates) in 2004. Year-specific proportions were stratified by geographic region. Increasing proportions of XDR TB were found among isolates from countries of eastern Europe/western Asia (n=five [9%] in 2000; n=11 [17%] in 2003) and the group of industrialized nations‡ (n=three [3%] in 2000; n=25 [11%] in 2004).

U.S. national TB surveillance data included 169,654 patients with drug-susceptibility testing results. During 1993-2004, a total of 2,689 (1.6%) MDR TB cases were identified, of which 1,814 (67%) had results reported for three or