

Rapid communications

OUTBREAK OF MEASLES IN TWO PRIVATE RELIGIOUS SCHOOLS IN BOURGOGNE AND NORD-PAS-DE-CALAIS REGIONS OF FRANCE, MAY-JULY 2008 (PRELIMINARY RESULTS)

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To date, 110 cases of measles have been identified by local health authorities in the Bourgogne and Nord-Pas-de-Calais regions of France, with onset of symptoms between 3 May and 19 July.

The first three cases were reported on 25 June by a general practitioner to the French national institute of health (Institut de Veille Sanitaire, InVS) regional office in Bourgogne, in the centre of France. The three unvaccinated cases were students at a private religious school for girls located in Bourgogne and had onset of rash between mid-May and 23 June. On the same day, another general practitioner in Nord-Pas-de-Calais reported a case of measles in an unvaccinated 14 year-old boy attending a private religious boarding school for boys. The boy had developed a rash on 19 June and happened to live in the same place in Bourgogne where the above-mentioned girls' school was located.

The two schools have elementary to secondary students. Both are private religious boarding schools. Most of the students come from the surrounding areas, some resident pupils are from other French regions, and some from abroad.

All students returned home on 26 June for summer holidays.

An epidemiological investigation was initiated in both regions by the local health authorities. In Bourgogne, the index patient was found to be a Swiss pupil vaccinated against measles with a single dose. She developed a fever on 28 April and a rash on 3 May. During mid-April she had spent a few days visiting Switzerland and Austria, and had been in contact with a cousin who had measles at the time of her visit. Her cousin is living in Feldkirch, Austria, where a measles outbreak was ongoing at the time.

Regarding the first case diagnosed in Nord-Pas-de-Calais, the investigation showed that three of the boy's sisters attended the school in Bourgogne and had been diagnosed with measles, with rash onset on 6, 7 and 15 June respectively*. The four siblings were not vaccinated against measles.

In order to identify possible further cases in the two places, the students' parents were asked by phone or through a questionnaire sent by mail to provide information regarding history of measles and vaccination status of their whole family. In addition, general practitioners and laboratories were asked to report possible cases

of measles to the health authorities and to perform laboratory diagnostic tests to confirm the cases.

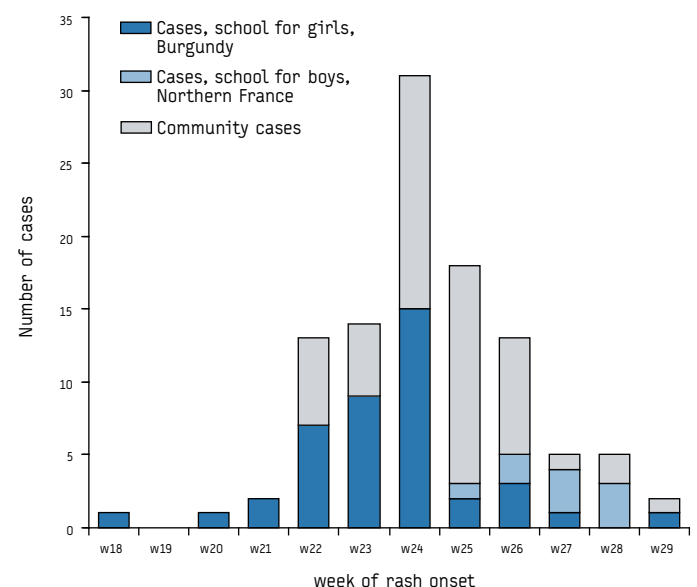
A clinical case of measles was characterised by fever and a generalised maculo-papular rash in association with cough, coryza, conjunctivitis or Koplik spots. Laboratory criteria for the diagnosis of measles were the detection of a significant rise in measles IgG antibody titre, the identification of measles IgM antibodies or the detection of measles virus nucleic acid by PCR.

Outbreak description

The figure shows the epidemiological curve for those 105 of the 110 cases for whom information on the date of onset was available.

FIGURE

Measles cases for whom the date of rash onset was available (n=105), by week of rash onset, outbreak in two schools, France, May-July 2008



Cases in the two schools (n=53)

Bourgogne

Between 3 May and 16 July, 43 cases were identified among the 147 girls attending the private school in Bourgogne (attack rate=29%). The mean age of the cases was 12 years (range six to 18 years). Five cases (12%) were laboratory-confirmed (salivary or serological IgM or PCR).

Thirty-nine cases (91%) were not vaccinated against measles. Measles immunisation coverage among the pupils of the school estimated through the questionnaires returned by their families was 40% for the first dose and 26% for the second dose of vaccine.

All the girls in the school were French except two Swiss girls, including the index case.

Among the 20 adults working with the children, one unvaccinated teacher in her 30s developed a rash on 30 May.

Nord-Pas-de-Calais

Between 19 June and 11 July, nine cases were identified among the 154 students attending the above-mentioned boys' school in Nord-Pas-de-Calais (attack rate=6%). The mean age of the cases was 14 years (range: eight to 17 years) and none of the cases were vaccinated against measles. Four cases were laboratory-confirmed, including one Canadian student. There were no reports of cases with complications or hospitalisation. Measles immunisation coverage among the pupils of the school, estimated from the returned questionnaires, was 65% for the first dose and 44% for the second dose of vaccine.

Twenty students attending that school returned home abroad for the holidays: 10 to Belgium, seven to the United Kingdom (Kent), two to Canada (Québec) and one to Luxembourg. Cases occurred in three British students from the same family (on 2 and 11 July) and one Canadian (on 7 July), once they were back home.

Community cases (n=57)

Of the 57 secondary cases between 26 May and 19 July that were linked to school cases, 52 occurred in siblings of cases (mean age: nine years, range: nine months to 21 years) and one in a parent (in their 30s). Three cases aged two, six and 13 years occurred in two other families who were close friends with measles cases. One adult case in their late 20s was in the general practitioner's waiting room at the same time as one laboratory-confirmed case.

All these cases were French. Two secondary cases were laboratory-confirmed. Two cases, both in their early 20s developed respiratory complications, and one of them was hospitalised. Fifty-five of the 57 cases (96%) were not vaccinated against measles, including two infants aged eight and nine months.

Microbiological investigations

Among the clinical specimens (throat swab, serum) sent to the French national reference centre for measles, measles virus was detected by RT-PCR in the samples obtained from five French cases. The sequences of the N-terminal part of the viral nucleoprotein gene were identical in all cases and belonged to genotype D5.

Control measures

Although the first case report was much delayed and most of the cases were identified retrospectively, the parents and local general practitioners in both areas around the two schools were given information about eviction measures and immunisation of contacts. The health authorities in the United Kingdom and Canada were informed about measles cases on their territories.

Nevertheless, many parents declined immunising their other children due to personal beliefs and did not consult a general practitioner when additional cases occurred in their household. These factors explain why only eight of the 110 cases were notified to the French health authorities through the mandatory notification system, although physicians had been reminded explicitly of the importance of reporting.

Discussion

With more than one hundred cases, this is the first important outbreak of measles that has been investigated in France since the national plan for the elimination of measles and congenital rubella was launched in 2005 [1,2]. The target of the elimination plan is to achieve in all the French *Départements* a minimum vaccination coverage of 95% for the first dose and at least 80% for the second dose at 24 months of age, and at least 90% for the second dose at six years of age. Currently, the average national vaccination coverage at two years of age is estimated to be 87%. In 2006 and 2007, 44 and 40 cases, respectively, were reported through the mandatory notification system, while 108 cases were reported for the first six months of 2008.

This outbreak proved to be linked to outbreaks reported by the public health authorities in other European countries, namely the ones ongoing since November 2006 in Switzerland [3] and since March 2008 in Austria [4], which are also caused by the measles virus D5 genotype. It shows once more how easily and rapidly the virus can spread in susceptible communities. The outbreak has also led to the exportation of three cases to the United Kingdom and one case to Canada. The main difficulty encountered in this outbreak was that the schools were already closed when the investigation started on 26 June, and that most families had already left for the holidays, which explained the - still ongoing - delay in reporting the cases to the health authorities.

The religious community in which the outbreak occurred appeared to have a relatively low vaccination coverage which explains the high attack rate in the school in Bourgogne. This outbreak highlights the presence of population subgroups that are susceptible to measles and represent specific risk groups for measles outbreaks.

* All the dates mentioned in the following are dates of rash onset.

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This article was published on 28 August 2008.

Citation style for this article: Noury U, Stoll J, Haeghebaert S, Antona D, Parent du Châtelet I, The investigation team. Outbreak of measles in two private religious schools in Bourgogne and Nord-Pas-de-Calais regions of France, May-July 2008 (preliminary results). *Euro Surveill.* 2008;13(35):pii=18961. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=18961>