

Ongoing measles outbreak, Geneva, Switzerland, January to March 2011

E Delaporte¹, J L Richard², C A Wyler Lazarevic³, O Lacour¹, M Girard¹, C Ginet⁴, A Iten⁴, P Sudre (Philippe.Sudre@etat.ge.ch)¹

1. Epidemiology and infectious diseases section, Cantonal Health Service, General Directorate for Health, Geneva, Switzerland

2. Infectious Diseases Division, Federal Office of Public Health, Bern, Switzerland

3. Youth Health Service, Department of Education, Geneva, Switzerland

4. Hospital Infection control Service, Cantonal University Hospital of Geneva, Switzerland

Citation style for this article:

Delaporte E, Richard JL, Wyler Lazarevic CA, Lacour O, Girard M, Ginet C, Iten A, Sudre P. Ongoing measles outbreak, Geneva, Switzerland, January to March 2011. *Euro Surveill.* 2011;16(10):pii=19815. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19815>

Article published on 10 March 2011

An outbreak of measles is ongoing in Geneva, Switzerland, since January 2011, in the context of a measles epidemic in neighbouring Rhône-Alpes, France. A total of 41 confirmed cases have been reported, the majority among young adults, many unaware of their non-immune status. There is no large clustering of cases and 14 cases were imported or linked to imported cases. Catch-up vaccination, especially among young adults, may be necessary to prevent further extension of this outbreak.

Background

Between 1 January and 2 March 2011, 58 suspected cases of measles were notified to the Geneva health authorities in Switzerland. Of the 58 suspected cases, 41 (8.9 cases per 100,000 population) were confirmed (by laboratory confirmation or evidence of an epidemiological link) and were living in Geneva. In the previous 18 months (July 2009 to December 2010), only nine confirmed cases had been notified. The last national outbreak of measles in Switzerland lasted from November 2006 to July 2010, with 4,410 reported cases, including 84 in Geneva [1].

A large outbreak of measles is currently being reported in the neighbouring region of Rhône-Alpes, France, where more than 900 cases have been notified from January to mid-February 2011 [2]. Geneva canton (population 464,000) is located on the eastern part of Switzerland and shares 103 km of its border with France and 4.5 km with the rest of Switzerland.

In Switzerland, measles notification has been mandatory since 1999. Physicians should report to local health authorities any patient presenting with maculopapular rash associated with fever and any of the following: cough, coryza or conjunctivitis. Notification of confirmed cases is also mandatory for laboratories. Childhood measles vaccination has been recommended since 1975: the current vaccination policy is to vaccinate twice with measles-mumps-rubella (MMR) at the age of 12 months and 15–24 months (the second dose was introduced in 1996) [3]. The most recent

estimate of national coverage among children aged two years is 89.8% for one dose and 74.6% for two doses (unpublished data).

Case definition

A case was defined as a Geneva canton resident presenting with the above clinical symptoms between 1 January and 2 March 2011, with either a detectable titre of measles virus-specific IgM antibodies, detection of measles virus RNA by PCR or a clinically significant increase in measles virus-specific IgG (laboratory-confirmed cases) or evidence of an epidemiological link with a laboratory confirmed case (epidemiologically linked cases).

Case description

Of the 41 cases included in the analysis, 33 were laboratory confirmed (by IgM or PCR) and eight were epidemiologically linked cases. The epidemic curve is presented in Figure 1. An additional 14 notified cases were not included, even though they were diagnosed in Geneva and reported to the health authorities, because they were French residents (n=11) or living in the canton of Vaud (n=3). All worked, attended school or consulted a physician in Geneva. Three suspected cases were reported and later ruled out due to negative serology results.

The male to female sex ratio of the 41 cases was 1:2 and their median age was 20 years (range: 11 months–58 years). Of 35 cases with known immunisation status, 25 had not been vaccinated with MMR vaccine, eight had received one dose and two at least two doses. Cases are presented by age group and vaccination status in Figure 2.

Six patients presented with at least one complication such as pneumonia (n=4), bronchitis (n=1), respiratory failure (n=1) and otitis (n=1). Eight patients were hospitalised: one was in intensive care with respiratory failure, one had pneumonia, three had a general alteration of health status (in one case, this was associated with hypoxemia and in one, with fever) and two were kept in

for overnight observation. The reason for hospitalisation is still unknown for one patient. No deaths were reported. All but one of the patients with complications or who were hospitalised were adults (median age: 36 years).

Of the 41 cases, 14 were imported (n=8) or epidemiologically linked with an imported case (n=6). These cases came from or were epidemiologically linked to cases from France (n=9), the canton of Vaud (n=4) and, possibly, Argentina (n=1).

Four clusters were identified: in two clusters, there were four cases per cluster, and in two clusters, there were two cases per cluster, giving a total of 12 cases. Transmission occurred in settings such as families (three occurrences), schools (n=2), social contacts (n=4) and the health service (n=1).

FIGURE 1

Measles cases by importation status and clustering, Geneva, Switzerland, 1 January–2 March 2011 (n=41)

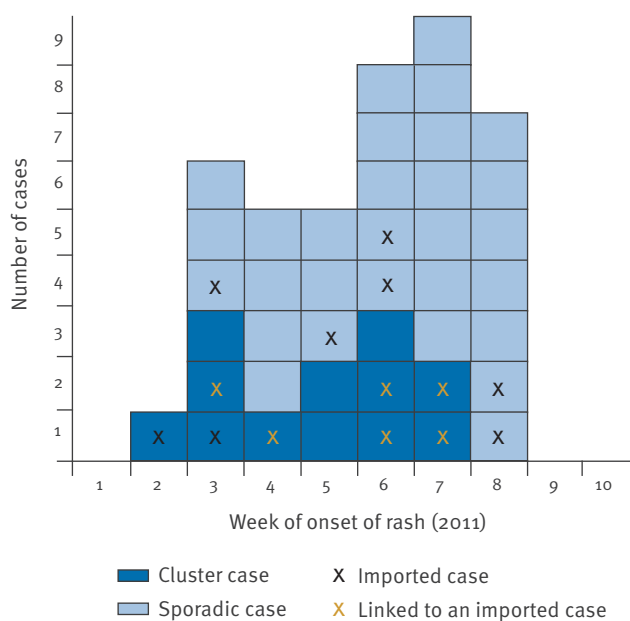
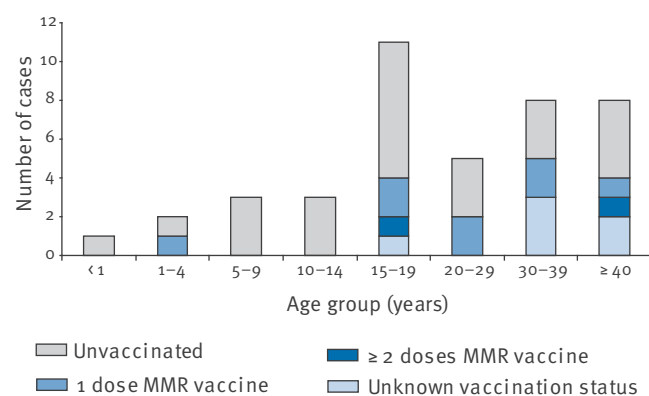


FIGURE 2

Measles cases by age and immunisation status, Geneva, Switzerland, 1 January–2 March 2011 (n=41)



MMR: measles-mumps-rubella.

Control measures

In Switzerland, notification is mandatory within 24 hours of diagnosis and control measures are implemented as early as possible by local health authorities and school health services without waiting for laboratory confirmation. Cases are isolated at home for four days after the beginning of their rash. Extensive and rapid contact tracing is conducted as an emergency measure so that contacts and relatives of cases can be informed and their vaccination or immunisation status assessed. Control measures are customised and depend on the age, immunisation status of the contact and when the contact took place. They include post-exposure vaccination of unvaccinated or non-immune contacts with recent exposure (less than 72 hours), administration of immunoglobulins to unvaccinated or non-immune pregnant women and newborns less than six months old. Unvaccinated or non-immune siblings, close and classmate contacts are quarantined at home for 18 days, with vaccination at the end of the quarantine period. A total of 20 exposed non-immune persons were quarantined. Five developed measles but there were no subsequent cases; seven are still quarantined.

In addition, Geneva health authorities regularly sent epidemiological updates and practical information by email to local physicians. These include reducing the age of first measles vaccination from 12 to 9 months of age. A press release, individual emails to all Geneva university students, and information letters to directors of schools, day-care centres and crèches have been sent out by the university or school health services. The main message has been targeted to young adults, recommending them to check their immunisation status and be vaccinated if necessary.

Discussion

This outbreak occurred in the context of a large measles epidemic in neighbouring Rhône-Alpes region in France. In addition, cases have also been recently diagnosed in the Lausanne and Basel regions, but very few are being reported in other parts of Switzerland.

The epidemiology of infectious diseases in the canton of Geneva is closely related to its neighbouring regions for obvious economic and geographic reasons. As a consequence, about one third of the cases in the outbreak were imported or related to imported cases, mostly from the bordering department of Haute-Savoie. The 14 cases who were not included in this analysis as they did not reside in Geneva were investigated in collaboration with the local French health authorities.

Most cases in this outbreak were adults, many of whom were not aware of their immune status. There was a delay in the diagnosis of several cases as early presentation of measles can be quite similar to influenza (seasonal influenza peaked in Geneva between weeks 1 and 7 of 2011). In some instances, there were multiple consultations before measles was diagnosed. However, only one healthcare-related case has been documented so far.

Control measures have been implemented early for all cases including those whose measles diagnosis has not yet been confirmed. Post-exposure vaccination is often ineffective because it is implemented too late. As secondary attack rate in unvaccinated household members is high [4], quarantine of non-immunised relatives and close contacts and classmates is enforced and has proven effective in previous outbreaks in Geneva [5]. None of the five quarantined contacts who developed measles transmitted the virus to others.

Although national MMR vaccination coverage remains below the threshold required for measles elimination in Switzerland [6,7], it is somewhat higher in Geneva. In 2007, 89.7% of 28-month-old infants had received two doses of measles vaccine [7-9] and in 2009, the corresponding figure was 91.7%, according to the most recent analysis of the Geneva vaccination database [10], in June 2010. Progressive accumulation of non- or insufficiently immunised persons is therefore inevitable and explains this outbreak, along with multiple introduction of infectious patients into the Geneva community.

Conclusion and recommendations

Fairly high MMR vaccination coverage in children as well as early and effective prevention measures have probably contributed to reducing the magnitude of this outbreak, as indicated by the absence of any large clusters of cases so far.

However, the influx of cases from neighbouring regions may continue and the potential for extension of the outbreak is substantial.

Catch-up vaccination is critical to prevent further extension of this outbreak, especially among young adults, particularly students. Careful scrutiny of the situation should continue as well as close collaboration with the neighbouring health authorities.

Acknowledgements

The authors wish to thank Drs S. Harbarth and T. Farinelli, Geneva University Hospital (HUG), Professor L. Kaiser, Drs P. Cherpillod and S. Cordey, Central virology laboratory (HUG), Geneva private laboratories and physicians, Dr E. Masserey and Ms M. Attinger, Vaud canton, as well as the French health authorities in Annecy, Bourg-en-Bresse and Lyon.

References

1. Richard JL, Masserey Spicher V. Large measles epidemic in Switzerland from 2006 to 2009: consequences for the elimination of measles in Europe. *Euro Surveill.* 2009;14(50):pii=19443. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19443>
2. Regional Office of the French Institute for Public Health Surveillance Rhône-Alpes.. *Surveillance sanitaire en Rhône-Alpes. Point de situation n° 2011/04 du 17 février 2011.* [Public health surveillance in Rhône-Alpes. Situation on 17 February 2011]. Available from: http://www.invs.sante.fr/regions/rhone-alpes/pe_rhone_alpes_170211.pdf
3. Federal Office of Public Health (FOPH). Federal Commission for vaccination. Swiss vaccination schedule. Directives and recommendations. Berne: FOPH. 2011. Available from: <http://www.bag.admin.ch/themen/medizin/00682/00684/02535/index.html?lang=fr>
4. Delaporte E, Wyler-Lazarevic CA, Richard JL, Sudre P. [Contribution of unvaccinated siblings to a measles outbreak in Switzerland]. *Rev Epidemiol Sante Publique.* 2004;52(6):493-501. French.
5. Federal Office of Public Health (FOPH). Flambée de rougeole à Genève, mars-avril 2007: description et mesures de contrôle. [Measles outbreak in Geneva, March-April 2007: description and control measures]. *FOPH Bulletin.* 2007;24: 435-8. French. Available from: <http://www.bag.admin.ch/dokumentation/publikationen/01435/03542/index.html?lang=fr&sort=>
6. Anderson RM, May RM. Immunisation and herd immunity. *Lancet.* 1990;335(8690):641-5.
7. Federal Office of Public Health (FOPH). *FOPH Bulletin.* 2010;11:367-77. Available from: <http://www.bag.admin.ch/dokumentation/publikationen/01435/11505/index.html?lang=fr>
8. Jeannot E, Wyler Lazarevic CA, Duperrex O, Chastonay P. [Evolution of vaccine coverage from school year 2003-2004 to 2006-2007, for 5 to 6-year-old children in Geneva]. *Med Mal Infect.* 2010;40(1):27-30. French.
9. Jeannot E, Wyler Lazarevic CA, Duperrex O, Chastonay P. [Evolution of the immunization coverage of 13 to 14 year-old adolescents in Geneva between four years]. *Santé Publique.* 2009;21(6):605-11.
10. Golay M, Sudre P. Immunization of 28 months old children in Geneva, Switzerland: Trend over a 6-year period, 1995-2000. *Soz Präventivmed.* 2005;50(5):319-23.