



RAPID RISK ASSESSMENT

Outbreak of measles in Haut-Rhin, Alsace, France, April 2015

7 May 2015

Main conclusions and options for response

An outbreak of measles involving 67 cases (median age 15 years) has been reported in the French region of Alsace, in the department of Haut-Rhin bordering Germany and Switzerland. The French index case had most probably been infected during a school trip to Berlin, following contact with a confirmed case in the German host family. Due to the low vaccination coverage among the students in the French anthroposophical school, the virus spread rapidly, leading to secondary cases in siblings and friends of the infected student.

Given that the reported vaccination coverage for the first dose of measles-containing vaccine (MCV) in France is below 90% and considering the current school holiday period in the region, it is considered possible that this outbreak could spread to other areas with susceptible populations, including neighbouring Germany and Switzerland.

Control measures implemented by the French health authorities in Alsace include vaccination recommendations and information to health professionals, families and schools. Contact tracing is ongoing in order to offer vaccination within 72 hours of exposure as a prophylactic measure if the vaccination status of contacts is 'unknown' or 'unvaccinated', and, when needed, to offer a second dose of MCV. In addition, people at high risk, unable to be targeted by the vaccine (such as infants and pregnant women) are offered administration of human normal immunoglobulin within six days after contact. Health professionals have also been reminded of the need to report cases.

Travel can increase the risk of exposure to measles virus and its spread into susceptible populations who are not vaccinated. Schools should be told to remind parents to check and address gaps, if necessary, in their children's immunisation status before travelling to areas with measles outbreaks.

Immunisation is the only effective preventive measure against acquiring measles. Travellers to the Alsace region of France who have not been immunised with two doses of MCV are at risk of being exposed to measles the same way as when travelling to any area where measles transmission is occurring.

As the measles vaccine is highly effective, vaccination should be recommended to all who are not, or not fully, immunised (and for whom there are no contra-indications), particularly, but not only, those who may be at higher risk of exposure associated with travel.

Measles outbreaks continue to occur in Europe because of low vaccination coverage in some countries and pockets of susceptible people who are either un- or under-immunised [1].

For controlling the outbreaks in Europe, the primary goal of response should be to implement control measures in all affected countries through immunisation activities targeting people at risk. In addition, all countries should strive to maintain a very high coverage of regular measles vaccination, in order to prevent future outbreaks.

Source and date of request

A message was posted by France in the Early Warning and Response System (EWRS) on 24 April 2015. The request was made by the European Commission on 25 April 2015.

Public health issue

Risk associated with an outbreak of measles in France.

Consulted experts

ECDC (in alphabetical order): Denis Coulombier, Niklas Danielsson, Edit Szegedi and Robert Whittaker

France: Denise Antona, Département des Maladies Infectieuses, Institut de Veille Sanitaire

Germany: Dorothea Matysiak-Klose MPH, Immunisation Unit, Robert Koch Institute

Disease background information

Measles is an acute illness caused by *morbillivirus*. The disease is transmitted via airborne respiratory droplets, or by direct contact with nasal and throat secretions of infected individuals. Measles is extremely communicable and it is estimated that 90% of non-immune people exposed to an infective individual will contract the disease. A person with measles will infect 12 to 18 people in a non-immune population.

The main symptoms are fever, rash, cough, runny nose and inflammation of the eye, the first symptoms appearing on average 10 days after exposure, but with a range of 7–21 days from exposure to onset of fever. A rash usually appears four days after the start of the first symptoms. Measles cases are considered infectious from four days before to four days after the onset of the rash.

Complications can include pneumonia, encephalitis, otitis media, laryngotracheo-bronchitis and secondary bacterial infections. There is no indication for the use of antibiotics except in cases with secondary bacterial infection. Hospitalisation rates often exceed 20% in EU Member States.

In addition, subacute sclerosing panencephalitis (SSPE), a rare degenerative disease of the central nervous system, characterised by behavioural and intellectual deterioration and seizures leading to rapid death, may develop six to eight years after primary infection.

Infants and immunocompromised individuals are at higher risk of severe disease and complications from measles. Measles frequently results in widespread outbreaks, mainly among unvaccinated individuals.

The disease is preventable by vaccination, which provides lifelong immunity in most recipients. Vaccine uptake of at least 95% with two doses of MCV is considered to be necessary to achieve a level of immunity in the population necessary to achieve elimination.

For a more complete background of the disease and its epidemiology in the EU, please see the ECDC factsheet on measles [2].

Event background information

Since 10 April 2015, an increase in the number of measles cases has been noticed in the Alsace region in France, in the district of Haut-Rhin: Colmar, Logelbach and Ribeauvillé. As of 3 May, 67 cases had been notified to the Regional Health Agency of Alsace (ARS Alsace).

The median age of cases was 15 years (range 2–23 years). Eleven cases have been laboratory confirmed, 51 had an epidemiological link and five were clinically compatible. Four cases had received one dose of measles-containing vaccine, all other cases were unvaccinated.

The onset of symptoms among reported cases ranges from 15 March 2015 until 'recent days' (as of 23 April) [3]. Outside the Alsace region, less than 30 cases of measles have been reported in France during the period 1 January to 27 April.

Investigations conducted by health authorities have identified four affected schools in the district. All reported cases have attended a music school in Colmar, France or have been in direct contact with cases who had.

Thirty-nine cases attend an anthroposophical private school (receiving children aged 2 to 20 years of age). Six cases attend a first grade secondary school (11 to 15 year-olds), 14 attend a second grade secondary school (15 to 20 year-olds). Eight cases are family members of other cases or have a possible social link.

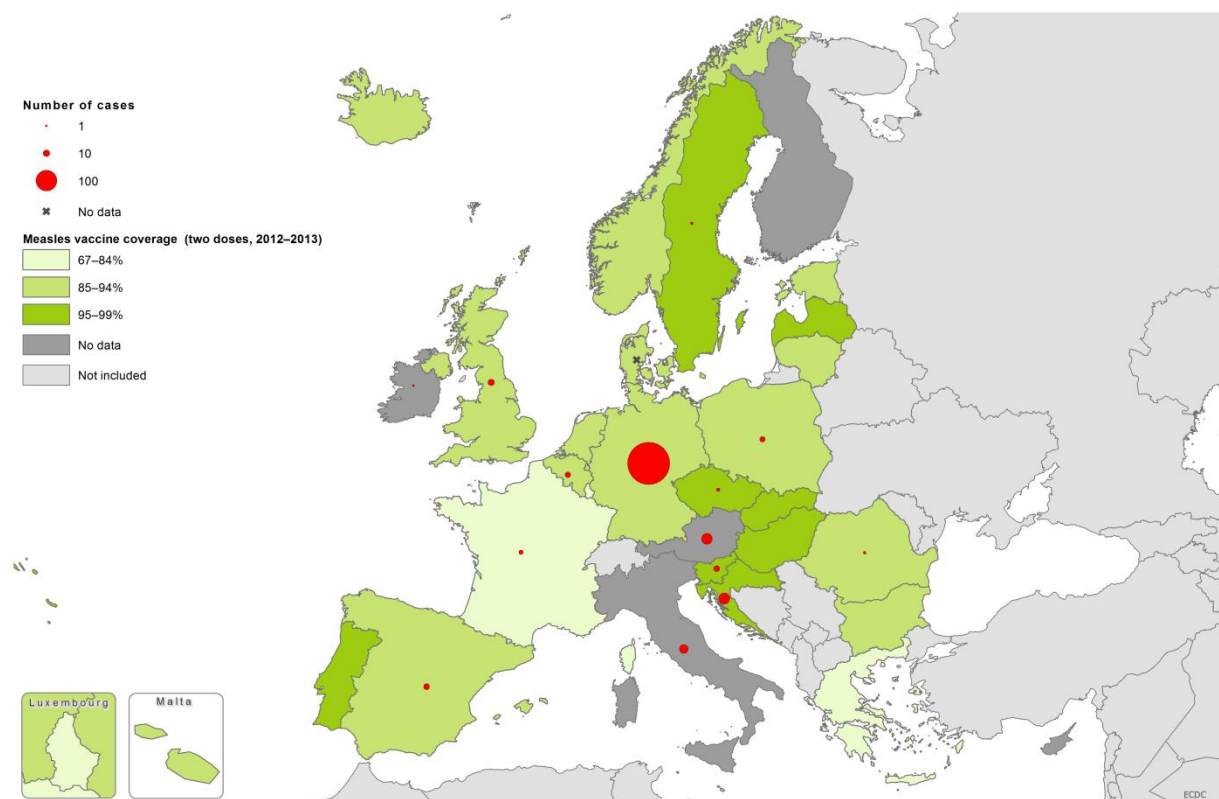
The French index case was a student of the anthroposophical private school that had most probably been infected during a school trip to Berlin, following contact with a confirmed case in the German host family. A large measles outbreak has been ongoing in Berlin since October 2014 with 1 134 cases reported as of 22 April 2015 [4].

Measles situation in Europe

During the recent 12-month period (March 2014–February 2015), 30 EU/EEA countries conducting measles surveillance reported 3 760 cases. France reported 203 cases of measles during the same period [5,6].

Measles vaccination coverage with two doses of MMR (measles–mumps–rubella) vaccine in France, where the current national recommendation is for completion of a two dose regimen by 18 months of age, is among the lowest in Europe (Figure 1, Table 2).

Figure 1. Number of measles cases by country, December 2014 and vaccine coverage (two doses, 2012–2013, WHO*), EU/EEA countries



Source: European Centre for Disease Prevention and Control. Measles and rubella monitoring, January 2015 –Reporting on January to December 2014 surveillance data and epidemic intelligence data to the end of January 2015. Stockholm: ECDC; 2015. Available from: <http://ecdc.europa.eu/en/publications/Publications/Measles-rubella-monitoring-first-quarter-2015.pdf>
 * Coverage figures (%) are official national figures reported via the annual WHO/UNICEF Joint Reporting Form.

Table 1. Vaccination coverage MCV 1 and MCV 2, 2003–2013, France [7]

Year	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
MCV 1	89	91	89	90	89	90	89	87	88	87	86
MCV 2	67	72	67	-	-	-	-	-	-	86	86

Source: WHO vaccine-preventable diseases: monitoring system. 2014 global summary [Internet]. Available from: http://apps.who.int/immunization_monitoring/globalsummary/coverages?c=FRA

There are several ongoing outbreaks of measles in Europe both in the European Union and in neighbouring countries [8]. There have been a number of introductions of measles recently from outbreak areas into other countries, causing new outbreaks.

The size and duration of import-related outbreaks are to a large extent determined by the overall population immunity, population density, timeliness of the detection and the public health response to the outbreak, and whether the outbreak affects pockets of under-vaccinated and vulnerable populations.

The first cases in the ongoing German outbreak were asylum seekers from Bosnia Herzegovina. An outbreak in Slovenia linked to an international dog show in November 2014 resulted in additional cases in Italy and Belgium.

There is a current outbreak in Croatia that started in early December 2014 with imported cases from countries experiencing measles outbreaks (Bosnia and Herzegovina, Germany and Serbia).

ECDC threat assessment for the EU

As the measles vaccination coverage in France is low, it is possible that more cases may be identified in the coming days.

The number of measles-susceptible persons increases over time, even in highly vaccinated populations, as successive cohorts of unvaccinated individuals add to the pool of susceptible individuals. Countries that did not conduct catch-up vaccination campaigns when the measles vaccine was first introduced may have immunity gaps in the cohorts born during the years leading up to the introduction as they would have quickly benefitted from herd protection. Groups of susceptible persons also include children who are too young to be vaccinated and the small proportion of vaccinated individuals who do not develop immunity (primary vaccine failure).

Containment of outbreaks of measles is most effectively achieved by catch-up vaccination campaigns, particularly in areas with low primary vaccination uptake, supported by timely and effective contact tracing and targeted vaccinations aimed at reducing secondary and tertiary transmission from known cases.

Considering that the school holidays began on 25 April in Alsace, further spread of the measles outbreak to other regions of France or across the border cannot be excluded if children travel during the incubation period.

Conclusions and options for response

Given that vaccination coverage for the first dose of measles-containing vaccine (MCV) in France is below 90% and given the current holiday period in the region, the risk of spread from this outbreak to other areas with susceptible populations, including neighbouring Germany, is considered possible.

Measles outbreaks continue to occur in Europe because there are pockets of susceptible people who are either un- or under-immunised. There are growing numbers of parents who either refuse to vaccinate their children or face barriers in accessing vaccination [1].

Travel to areas, or contact with communities, with low levels of vaccine uptake is associated with increased risk of exposure to measles virus and can result in further spread into susceptible populations who are not vaccinated.

Measures necessary to control measles outbreaks include:

- identifying high-risk groups/areas for implementing strategies to improve vaccination coverage and other control measures;
- raising awareness in the community about the disease and its prevention;
- detecting and investigating all suspected cases;
- rapidly testing cases and identifying chains of transmission;
- monitoring the changing epidemiology of measles.

Control measures implemented by the French health authorities in Alsace include information to health professionals, families, schools and vaccination recommendations. Contact tracing is ongoing in order to offer vaccination within 72 hours of exposure as a prophylactic measure if the vaccination status of contacts is 'unknown' or 'unvaccinated', and, when needed, to offer a second dose of MCV. In addition, some people or groups that cannot be vaccinated (such as infants and pregnant women) are offered administration of human normal immunoglobulin within six days after contact. Health professionals have also been reminded of the need to report cases.

Immunisation is the only effective preventive measure against acquiring measles. Travellers to the Alsace region of France who have not been immunised with two doses of MCV are at risk of being exposed to measles, in the same way as when travelling to any area where measles transmission is occurring. As the vaccine is highly effective, vaccination should be recommended to all who are not, or not fully, immunised (and for whom there are no contra-indications), particularly, but not only, those who may be at higher risk of exposure associated with travel.

For controlling the outbreaks in Europe the primary goal of response should be to implement control measures in all affected countries through immunisation activities targeting people at risk. In addition, all countries need to maintain a very high coverage of regular measles vaccination, in order to prevent future outbreaks.

Outbreaks of measles continue to occur across many countries in Europe but the risk of exposure to measles is not restricted to Europe.

References

1. World Health Organization Europe. Press release: WHO/Europe calls for scaled-up vaccination against measles Copenhagen: WHO; 2015 [29 April 2015]. Available from: <http://www.euro.who.int/en/media-centre/sections/press-releases/2015/who-europe-calls-for-scaled-up-vaccination-against-measles>.
2. European Centre for Disease Prevention and Control. Factsheet on measles for health professionals. Stockholm: ECDC; 2015 [Accessed 25 April 2015]. Available from: http://ecdc.europa.eu/en/healthtopics/measles/Pages/health_professionals.aspx.
3. L'Agence régionale de santé Alsace. Communiqué de Presse, Jeudi 23 avril 2015: Recrudescence de foyers épidémiques de rougeole dans le Haut-Rhin Strasbourg L'Agence régionale de santé Alsace; [Accessed 25 April 2015]. Available from: http://www.ars.alsace.sante.fr/fileadmin/ALSACE/Internet/ars_alsace/espace_presse/DP_et_CP/CP_rougeole_Alsace_23042015.pdf.
4. Landesamt für Gesundheit und Soziales Berlin (LAGeSo). Epidemiologischer Wochenbericht für die Meldewoche 16/2015 über die im Land Berlin gemäss IfSG erfassten Infektionskrankheiten.; [Accessed 25 April 2015]. Available from: http://www.berlin.de/imperia/md/content/lageso/gesundheits/infektionsschutz/wb/2015/berlin_ewb_2015_16_gesch.pdf?start&ts=1429818044&file=berlin_ewb_2015_16_gesch.pdf.
5. European Centre for Disease Prevention and Control. Number of measles cases by month and notification rate (cases per million) by country, March 2014 to February 2015, EU/EEA countries. Stockholm: ECDC; 2015 [Accessed 25 April 2015]. Available from: http://ecdc.europa.eu/en/healthtopics/measles/epidemiological_data/Pages/measles_past12months.aspx.
6. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases. [Database on the internet]. Stockholm: ECDC; 2015 [cited 4 April 2015]. Available from: <http://ecdc.europa.eu/en/data-tools/atlas/Pages/atlas.aspx>
7. World Health Organization Europe. WHO vaccine-preventable diseases: monitoring system. Geneva: World Health Organization; 2015 [Accessed 25 April 2015]. Available from: http://apps.who.int/immunization_monitoring/globalsummary/coverages?c=FRA.
8. European Centre for Disease Prevention and Control. Communicable disease threats report for Week 13, 22-28 March 2015. Stockholm: ECDC; 2015. Available from: <http://ecdc.europa.eu/en/publications/Publications/communicable-disease-threats-report-28-mar-2015.pdf>.