



RAPID RISK ASSESSMENT

Outbreak of measles linked to a dog show in Slovenia, 8–9 November 2014

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Main conclusions and recommendations

An outbreak of measles in Slovenia is likely to have been caused by common exposure at an international event in the country. Of the 19 measles cases reported in November, 17 have a history of visiting a dog show which took place in Vrtojba near Nova Gorica on 8 and 9 November 2014. There is strong epidemiological evidence that the audience and exhibitors at this event were exposed to a contagious measles case. The two cases without a link to the dog show were both imported from Bosnia and Herzegovina where a measles outbreak with more than 2000 cases is ongoing since February 2014.

Slovenia has interrupted endemic measles transmission, and measles vaccination uptake is high in the country. The risk of extensive spread from this outbreak is considered low, and the risk that it would result in re-establishment of endemic measles transmission in the country is considered very low.

With exhibitors from 27 European countries, the show attracted an international audience. It is possible that some of the international visitors may have become infected and later developed measles in their respective countries of residence.

The incubation period for exposure at the show has passed. The public health focus should now be on identifying contacts of primary cases in Slovenia and in the home countries of both exhibitors and members of the audience.

The organisers of the event and the public health authorities should consider contacting the exhibitors, inquiring about their vaccination status and any additional cases of measles. Contact tracing should be conducted for all identified measles cases.

Source and date of request

ECDC internal decision, 28 November 2014

Public health issue

This report assesses the risk of cross-border spread of measles following an outbreak with a probable epidemiological link to an international dog show near Nova Gorica on 8 and 9 November 2014. The show attracted exhibitors from 27 European countries, most of which EU Member States. Although Slovenia has interrupted [1] endemic measles transmission and vaccination uptake exceeds 95% in the population, there remains a risk that the outbreak could spread within the country.

Consulted experts

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Disease background information

Measles is an extremely contagious disease with an incubation period of 7–21 days. A person with measles will infect between 12 to 18 people in a non-immune population. The disease is targeted for elimination in the WHO European Region, but measles remains endemic in many countries, including a number of EU Member States, and the elimination target (2015) is looking progressively more challenging.

Imported cases frequently cause outbreaks in EU Member States that have eliminated endemic transmission. Many of these import-related outbreaks result from travel in the EU. The size and duration of import-related outbreaks in highly vaccinated populations 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 undervaccinated and vulnerable populations.

The live attenuated measles vaccine is routinely administered in two doses, with the first dose given after the first birthday. The vaccine is highly effective and induces long-term, often life-long, immunity.

Infants and immunocompromised individuals are at higher risk of severe disease and complications from measles.

Most patients recover fully from measles but complications are frequent, and hospitalisation rates often exceed 20% in EU Member States. Complications include pneumonia, otitis media, bronchitis, diarrhoea and acute encephalitis. For a more complete background of the disease and its epidemiology in the EU, please see the ECDC factsheet on measles [2] and the ECDC website pages on measles [3].

Event background information

On 27 November 2014, the Institute of Public Health of the Republic of Slovenia reported – through the Early Warning and Response System – a confirmed outbreak of measles with a probable epidemiological link to an international dog show [11] held in Vrtojba, Nova Gorica, on 8 and 9 November 2014. Vrtojba is located on the country's western border with Italy. The show attracted 670 exhibitors from 27 countries, 21 of which are EU/EEA Member States. Represented countries included: Italy (366), Slovenia (112), Croatia (36), Austria (30), the Czech Republic (26), Russia (25), Belgium (7), Germany (10), Serbia (9), Hungary (6), Slovakia (6), Switzerland (5), France (5), Bosnia and Herzegovina (5), Poland (3), Canada (1), Spain (2), Ireland (1), Latvia (2), Portugal (2), Israel (2), Luxemburg (1), the Netherlands (2), Ukraine (1), the United Kingdom (1), Norway (1), and Sweden (1).

The first two cases were reported on 25 November; both had attended the dog show. By 3 December, 12 confirmed and five probable measles cases with a history of visiting the dog show had been notified and four suspected cases had been discarded. Onset of disease for the 17 cases was between 20 and 26 November, 12–18 days after the show. Eleven of the cases were men, with age ranging from 34 to 51 years. Two additional confirmed cases of measles without a link to the dog show were reported in November. Both cases were imported from Bosnia and Herzegovina where an outbreak of more than 2 000 measles cases has been ongoing since February 2014 [4].

The genotypes have not yet been established. The virus sequencing and virus isolation will be done at the WHO regional reference laboratory at the Robert Koch Institute, Germany.

Threat assessment

Slovenia has interrupted endemic measles transmission, and the most recent significant measles outbreak was in 1994–95 (405 cases) [5]. From 2000 to 2009, the country did not report any cases of measles. From 2010 to 2013, it reported mostly imported cases. Prior to the current outbreak, two unlinked imported cases had been reported in 2014 (Table 1).

Slovenia introduced routine measles vaccination with a one-dose schedule for infants in 1968 [6]. A second dose of measles vaccine at seven years of age was added in 1978. In 1990, the trivalent measles-mumps-rubella vaccine (MMR) was introduced, with the first dose administered at 12–18 months and the second at six years of age. The birth cohort in 2013 was 21 111, down from 29 786 in 1975. MMR vaccination uptake is high, and the reported coverage with two doses of measles-containing vaccine (MCV) varied from 95.0% to 99.0% during the 2003–2013 period (Table 2).

Table 1. Number of measles cases reported in Slovenia, 2000–2014

Year	2000–2009	2010	2011	2012	2013	2014
Cases	0	2	22	2	1	2

Source: TESSy [7]

Table 2. Coverage with two doses of MMR vaccine in Slovenia, 2003–2013

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Coverage (%)	98.9	99.0	99.0	99.0	98.4	98.5	98.0	96.4	96.0	96.0	95.0

Source: CISID [8]

The number of measles-susceptible persons increases over time, even in highly vaccinated populations as in Slovenia: most unvaccinated individuals never get infected (i.e. never develop natural immunity to measles), and thus 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 quickly benefit from herd protection. Groups of susceptible persons also include the small proportion of vaccinated who do not develop immunity (primary vaccine failure), and children who are too young to be vaccinated.

Of the 17 cases in the first generation of transmission in this outbreak, two were born before the introduction of routine childhood vaccinations against measles. Six of the infected are known to have received two doses of measles vaccine, and two received one dose. For the remaining cases vaccination status is unknown but since they were born after the introduction of routine childhood measles vaccination, it is likely that many of them were vaccinated. It should be noted that it is not unusual that a large proportion of measles cases have a history of vaccination when an outbreak occurs in highly vaccinated population.

What is the risk of a propagated outbreak and re-establishment of endemic transmission in Slovenia?

Given the high vaccination uptake in Slovenia, the risk of a large outbreak is considered low, and the risk of this outbreak leading to re-establishment of endemic transmission is considered very low. The far end of the 7–21 days incubation period for measles has passed, and it is unlikely that large numbers of additional first-generation infections with a link to the dog show will be detected in Slovenia. The final size of the outbreak will be determined by the timeliness and effectiveness of contact tracing and responsive vaccinations aimed at reducing secondary and tertiary transmission.

What is the risk for spread to other countries?

Considering that measles is an airborne and highly contagious virus, the risk is high that susceptible international visitors and exhibitors at the dog show could have been infected. The incubation period has passed, and those who were indeed infected at the show would have developed symptoms by now. The international visitors at the exhibition are likely to have returned home, and it cannot be excluded that some of them have developed measles in their country of residence. The contact details of the exhibitors are known to the organisers and so they can be contacted directly. This is not possible for the domestic and international non-exhibitor audiences who would need to be informed through public information channels in their respective countries.

Conclusions

Measles virus is airborne and therefore highly transmissible in crowded and closed indoor environments such as schools, conference centres, airports, and exhibition halls. There are strong indications that at least one infective measles case was present at the dog show: the fact that 17 out of 19 measles cases detected in Slovenia in November reported visiting the exhibition hall, and that the dates of onset of disease are consistent with exposure around 8–9 November clearly point in this direction.

In view of the high MMR uptake and the fact that imported cases have not generated large outbreaks in recent years, the risk is considered low for a propagated spread of measles in Slovenia.

The following options for further reducing the risk of measles spreading in Slovenia should be considered:

- Identifying additional cases among the audience at the show through the media by asking people who think they may have contracted measles to contact public health authorities
- Tracing people who have been in contact with the first generation of cases during the infectious period (four days before onset of rash until four days after rash appeared) and determine their immunity status.
- Vaccinating all unvaccinated contacts and all contacts without documentation of vaccination within 72 hours of exposure to a contagious case.
- Treatment with human polyvalent immunoglobulin (immune-prophylaxis) should be considered up to six days after exposure [9,10] for contacts who are identified too late to be vaccinated and for people who, for medical reasons, cannot be vaccinated.

Options for reducing the risk of spread in the home countries of international exhibitors and audience members:

- Contacting the international exhibitors at the dog show and confirming whether they have developed measles or symptoms consistent with measles since visiting the show.
- If any of the exhibitors develop measles, public health authorities in the concerned countries should be informed so that they can initiate contact tracing in order to reduce the number of secondary cases.

This outbreak is a further reminder that measles is still circulating in Europe and that actions at all levels are needed to meet the elimination goal.

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