



RAPID RISK ASSESSMENT

Measles on a cruise ship, Mediterranean Sea

5 March 2014

Source and date of request

ECDC internal decision, 28 February 2014.

Public health issue

This document aims to assess the risk associated with a first outbreak of measles on board a cruise ship while docked in port in Civitavecchia, Italy; it also proposes mitigation options, e.g. the containment of the disease.

Consulted experts

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1 Disease background information

Measles is a highly infectious disease and frequently results in widespread outbreaks, mainly among unvaccinated individuals. Incubation period is about 10 days, with approximately 7–18 days from exposure to onset of fever. Rash usually appears 14 days after exposure. Measles cases are considered infectious four days before and four days after the onset of the rash. Measles can be complicated by pneumonia, otitis media, laryngotracheo-bronchitis; diarrhoea occurs commonly in young children.

Acute encephalitis, which often results in permanent brain damage, occurs in approximately 1 of every 1 000 cases. Death, predominantly resulting from respiratory and neurologic complications, occurs in 1 of every 500 to 5 000 cases, as reported in recent European outbreaks [1-3]. Case-fatality rates are increased in children younger than five years of age and immuno-compromised persons, including individuals with leukaemia, AIDS and severe malnutrition.

In addition, subacute sclerosing panencephalitis (SSPE), a rare degenerative central nervous system disease characterised by behavioural and intellectual deterioration and seizures leading to rapid death may develop six to eight years post primary infection. SSPE is more common among males who acquired measles before one year of age [4]. The incidence of SSPE is unknown but Bojinova et al. report 40 cases between 1978 and 2002 in Bulgaria [5].

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The single most effective preventive measure is vaccination with two doses of trivalent measles, mumps and rubella (MMR) vaccine. Vaccine uptake of at least 95% with two doses of MMR vaccine is considered to be necessary to reach elimination [6]. However, MMR, being a live attenuated vaccine, cannot be offered to immunosuppressed individuals and therefore all EU/EEA Member States have a susceptible population in all age groups.

2 Event background information

On the evening of 27 February 2014, Italy reported that on board the Costa Pacifica – a cruise ship which had arrived from Palma de Mallorca, Spain, earlier that day and docked in the port of Civitavecchia, Italy – around forty crew members showed symptoms of exanthematous disease suspected to be measles. This was based on laboratory confirmation (PCR on urine samples) and the fact that the ship's medical staff reported on 26 February 2014 that one crew member, a 27-year-old female, had a respiratory illness and a skin rash when she disembarked at Genoa on 22 February.

The medical staff at the Rome–Fiumicino Office of USMAF (Uffici di Sanità Marittima, Aerea e di Frontiera: Maritime, Air and Frontier Health Office under the Italian Ministry of Health), which is also responsible for Civitavecchia, and experts on infectious diseases from the National Institute of Infectious Diseases (INMI) in Rome performed a thorough examination of the medical situation on board upon the ship's arrival.

On 28 February, Italy reported that nine persons were hospitalised at the National Institute of Infectious Diseases (INMI) in Rome, with symptoms suggestive of measles. Initial laboratory tests confirmed the diagnosis of measles in seven people (IgM antibodies). Two cases of probable measles infection in crew members were identified when the ship arrived in Savona on 1 March 2014. They and four close contacts were transferred to a resort in Orbetello, Italy, for isolation.

The ship arrived in Marseille on 2 March 2014 where no clinical cases of measles or fever were reported among the passengers and crew on board.

On 3 March, the Costa Pacifica docked in the port of Barcelona, Spain. After an inspection by the Port Health Officers, who had assessed the sanitary situation on board the vessel, the Ship Sanitation Certificate was 'negative', i.e. no cases were detected on board the vessel.

On 5 March 2014, the ship called at Palma de Mallorca, Spain; the ship's authorities detected no new cases.

According to the information provided by the medical team on board and the medical log, no new suspected measles cases have been detected since 1 March 2014. The itinerary of the cruise ship involves the ports of Marseille, France; Barcelona, Spain; Palma de Mallorca, Spain; Civitavecchia, Italy; La Spenzia, Italy; and Savona, Italy.

As of 5 March 2014, all cases of exanthematous disease on the cruise ship have been reported in crew members; no cases in passengers have been reported to ECDC.

3 Assessment

The Costa Pacifica regularly sails on seven-day cruises in the western Mediterranean. The apparent high attack rate among the crew suggests a low vaccine coverage in this group. Measles is highly contagious. Given the relatively long incubation period and the contagiousness prior to disease symptoms, it is likely that new cases will appear among the crew, and further transmission may take place.

Considering the risk for complications and other more severe diseases as mentioned above, the following preferred options for mitigation could be considered [7]:

For passengers and crew having disembarked in the past seven days

- Disembarked passengers and crew should provide information about their potential exposure to measles during the cruise.
- Disembarked passengers and crew are advised to review their measles vaccinations status. If their vaccination status is 'unknown' or 'unvaccinated',
 - they should get immediately vaccinated if they left the boat during the past three days (as a prophylactic measure);
 - they should be offered administration of human normal immunoglobulin (HNIG) if they belong to a risk group, e.g. pregnant women or immunocompromised patients *and* have left the boat in the past six days;

- they are advised to seek medical attention if they present with symptoms indicating measles, e.g. cough, runny nose, red eyes, fever, and rash. When presenting with symptoms, patients should avoid reporting to a general practitioner or emergency room department to prevent further transmission and instead call medical services for advice first.

For passengers and crew on the cruise ship

- Passengers and crew on board the ship should be informed about the possibility that they could be exposed to measles during the cruise.
- They should be asked about any symptoms that could indicate measles and seek medical attention if they show symptoms indicative of measles.
 - Suspected cases should be isolated and disembark if possible.
 - Their close contacts should be isolated if their vaccination status is 'unknown' or 'unvaccinated'.
- Passengers and crew should be advised to review their measles vaccinations status. If their vaccination status is 'unknown' or 'unvaccinated',
 - they should be offered vaccination immediately;
 - they should be offered administration of human normal immunoglobulin (HNIG) if they belong to a risk group, e.g. pregnant women or immunocompromised patients.

For incoming crew and passengers

- Incoming crew and passengers should be informed about the possibility that they could be exposed to measles during the cruise.
- They should be asked to review their measles vaccinations status. If their vaccination status is 'unknown' or 'unvaccinated',
 - they should be immediately offered vaccination;
 - they should be offered administration of human normal immunoglobulin (HNIG) if they belong to a risk group, e.g. pregnant women or immunocompromised patients.

Priority should be given to children below two years of age as they are likely to be unvaccinated (or not fully vaccinated) and have a higher risk of complications.

Annex. Sample of an information leaflet for passengers and crew with potential exposure to measles on board cruise ships

Measles health warning

Several measles cases have been reported on the cruise ship *Costa Pacifica* [Note: Consider adding details, for example cruise itinerary and ports of call].

So far, only crew members have been affected, and no cases were reported among passengers.

However, as measles is a highly infectious disease, there is a risk of getting measles if you have not been immunised or previously infected with measles.

Many people wrongly assume that measles is a harmless childhood disease. This is not the case. Measles can lead to serious complications, especially in children too young to be vaccinated, susceptible persons (i.e. individuals who are not fully vaccinated or have not had measles previously), with an increased risk for complications, particularly in pregnant women or people with a weakened immune system.

What to do if you think you have been in close contact of someone with measles?

- If you are vaccinated or had the disease in the past, no further action is required. Family doctors usually keep vaccination records, and you might want to contact your doctor to verify your vaccination status.
- If you have never been vaccinated or you do not remember receiving a vaccination, you should receive measles vaccination.
 - If vaccination is provided within 72 hours after leaving the cruise ship, it may prevent you from getting sick.
 - If you or your children belong to a particular risk group that can develop complications (children too young to be vaccinated, pregnant women, or people with a weakened immune system), you may be offered measles immunoglobulin to provide immediate protection against the infection. Immunoglobulin should be given within six days after exposure to a measles case. Consult a physician if you think you may belong to a risk group.

What to do if you start developing measles symptoms?

- Immediately call your doctor or healthcare provider; when you arrive at your healthcare provider, immediately inform the receptionist about the reason for the consultation.
- Avoid going to the hospital unless you are seriously ill; if you should go to the hospital, inform the staff immediately about the reason for the consultation.
- Avoid crowded waiting areas and public transportation.
- Avoid all contact with babies under the age of two, pregnant women, and people with weakened immune systems.
- Stay at home until the rash has developed or when your doctor advises you to do so.

More information on measles can be found on the website of the European Centre for Disease Prevention and Control (ECDC):

<http://ecdc.europa.eu/en/healthtopics/measles/Pages/factsheet-general-public.aspx>

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