



RAPID RISK ASSESSMENT

Hantavirus Pulmonary Syndrome outbreak in Yosemite Park, California, USA

5 September 2012

Main conclusions and recommendations

- The US Centers for Disease Control have reported an outbreak of Hantavirus Pulmonary Syndrome (HPS) associated with staying in the 'Signature Tent Cabins' in the Boystown area of Curry Village at Yosemite National Park, California.
- During the outbreak period, five hundred and ninety-one EU citizens made bookings for these tent cabins. In total, 1 923 people in booked groups from the EU stayed at the cabins (10 June– 24 August 2012) and were therefore potentially exposed to hantaviruses.
- The risk of infection is low as only six cases have been confirmed so far among American visitors and none among European visitors, although several thousand people have been in the area.
- As HPS is not transmitted from person to person there is no risk to the general public in Europe from this outbreak and no need for public health measures to be taken in the event of contact with cases.
- As infection with New World hantaviruses causes severe disease, any person presenting with either fever above 38.3°C, chills, myalgia, coughing, headaches, or gastrointestinal symptoms within six weeks of staying at the 'Signature Tent Cabins' in the Yosemite National Park should seek medical advice.
- Clinicians are reminded to consider the diagnosis of HPS in all persons presenting with clinically compatible illnesses and to ask about potential rodent exposure or a recent visit to Yosemite National Park.
- The contact details of EU citizens who booked accommodation in the tent cabins have been provided by the US CDC and the Park authorities to the European Commission. Member States are currently informing them of their potential exposure.

Source and date of request

ECDC Internal Decision, 3 September 2012.

Public health issue

To assess the risk that travellers having visited the Yosemite National Park and resided in the affected area might develop Hantavirus Pulmonary Syndrome (HPS) and to assess the additional risk for the EU.

Disease background information

The diseases caused by hantaviruses (Bunyaviridae family) are determined by the distribution and natural history of their primary rodent hosts [1]. Hantaviruses causes two distinct clinical syndromes in humans: hemorrhagic fever with renal syndrome (HFRS) in the Old World caused by the *Myodes*-, *Rattus*-, and *Apodemus*-borne hantaviruses. In the New World, hantaviruses cause Hantavirus Pulmonary Syndrome (HPS) transmitted by rodents in the Sigmontonidae family which are only identified in the Americas [2,3].

HPS is an acute, zoonotic viral disease. The main reservoirs of the disease are rodents. Humans are infected by inhalation of infected rodents' excreta or by direct contact with rodents. The fatality rate in humans is around 36% [4,5].

Since its recognition in 1993, 602 cases have been reported in the US, 50 of which came from the state of California, not including these recent cases [6].

Symptoms of HPS include fever above 38.3°C, chills, myalgia, coughing, headaches, and gastrointestinal symptoms. Affected persons often develop breathing difficulties which may require oxygen therapy, as well as pulmonary oedema [3,5].

Laboratory abnormalities in HPS include thrombocytopenia, leukocytosis, hemoconcentration, hypoalbuminemia, and an increase in serum LDH (Lactate Dehydrogenase).

There is no specific treatment available. Supplemental oxygen, mechanical ventilation, fluid management and the appropriate use of inotropes and vasopressors are crucial to patient care. The efficacy of the antiviral agent ribavirin may depend on the phase of infection and the severity of disease when treatment is initiated (7,8,9,10).

Event background information

Since 10 June 2012, six laboratory-confirmed cases of HPS, associated with staying in the Yosemite National Park, California, have been reported by the Californian Department of Public Health (CDPH) (11,12). Two of the patients died. Additional suspect cases are being investigated in several health jurisdictions. Four case-patients with HPS stayed in the 'Signature Tent Cabins' in the Boystown area of Curry Village (see map, Annex I). One stayed in the area but not in the tents and the location of the remaining case-patient's lodging is currently under investigation. Between 10 June and 24 August 2012, an estimated 10 000 persons stayed in the 'Signature Tent Cabins'. On 24 August 2012, the tents were disinfected and visitors were relocated. Visitors who stayed in the tents between 10 June and 24 August are at risk of having been exposed to hantavirus. In those who were exposed during the past six weeks (between 23 July and 24 August) the disease could still be incubating and they could become ill later.

The US Centers for Disease Control and Prevention (CDC) and the Park authorities have attempted to contact all persons who stayed in the affected accommodation during this period. The CDC has informed ECDC that 591 individuals from 17 Member States and French Polynesia had reservations in the affected accommodation between 10 June and 25 August 2012. In total, 1 923 people in booked groups from the EU (74% adults and 26% children) stayed in the accommodation. It is likely that most of the residents in the tent cabins were EU citizens but this information is unknown at present.

ECDC and the European Commission (DG SANCO) have provided Member States with the list and contact details of EU citizens that stayed in the 'Signature Tent Cabins' and this includes the list of visitors which could not be reached by the Park authorities.

Table 1. Number of potentially exposed EU citizen, by Member State

Member State	Number of EU citizens having booked	Number not reached by Park authorities	Number of people in the booked groups
Austria	10	3	34
Belgium	37	11	124
Denmark	32	8	105
Germany	74	33	250
Spain	33	6	88
Finland	3	0	5
France	143	46	502
French Polynesia	3	0	10
UK	108	31	342
Ireland	10	4	31
Island	1	0	4
Italy	46	9	140
Luxemburg	3	0	10
Netherlands	54	11	170
Norway	9	1	23
Poland	2	0	6
Sweden	21	5	71
Slovenia	2	1	8
Total EU/EEA	591	169	1 923

Following reports of cases at the Yosemite National Park, CDC published a health advisory on 31 August 2012 for health care providers (13) and a list of frequently asked questions (14).

There has only been information on one case of HPS imported into Europe and this was published in 2002 (15).

The European Network for Viral Imported Disease (ENIVD-CLRN) (16), which has the capacity to detect hantavirus infections and recently performed an external quality assurance study on hantaviruses, has been mobilised (17). The reference laboratory for hantavirus in Sweden has offered additional support for serology confirmation by neutralisation assay if necessary.

The European Commission activated the QUANDHIP network (18) to support Member States requiring further assistance in carrying out laboratory testing.

In France, the French National Institute for Public Health Surveillance (InVS) has reported an ongoing investigation into two potentially exposed cases (19).

Case definition

ECDC proposes the following case definition for the epidemiological investigation of EU citizens (20,21):

Potentially exposed person

Any person who visited the 'Signature Tent Cabins' in the Boystown area of Curry Village at Yosemite National Park, California between 10 June and 24 August 2012.

Suspected case

A potentially exposed person with a fever above 38.3°C, corroborated by bilateral diffuse interstitial oedema, a clinical diagnosis of acute respiratory distress syndrome (ARDS), radiographic evidence of noncardiogenic pulmonary oedema, or unexplained respiratory illness resulting in death and occurring in a previously healthy person.

Confirmed case

Meets the definition of a suspected case and meets the laboratory criteria for diagnosis.

Laboratory criteria for diagnosis

- Detection of hantavirus-specific immunoglobulin M or rising titres of hantavirus-specific immunoglobulin G, or
- detection of hantavirus-specific ribonucleic acid sequence by polymerase chain reaction in clinical specimens, or
- detection of hantavirus antigen by immunohistochemistry.

ECDC threat assessment for the EU

This is an unusual cluster of HPS case-patients exposed to a specific tent camp in Yosemite National Park in the US.

Based on information currently available, the highest risk of infection appears to be for visitors who stayed in the 'Signature Tent Cabins' in the Boystown area of Curry Village at Yosemite National Park.

Several thousand visitors to the Park may have potentially been exposed between 10 June and 24 August 2012. As the incubation period can be up to six weeks, it is possible that additional cases may be identified in the coming five weeks. Furthermore, it is possible that exposed visitors who developed the disease but were not diagnosed could be retrospectively recognised as cases.

The risk of European citizens who have not visited Yosemite National Park contracting the infection is very low and mainly limited to campers and hikers staying in shelters or camps where there are rodents (22).

As HPS is not transmitted from person to person there is no need for public health measures to be taken in the event of contact with cases.

Hantaviruses have not been associated with transmission by blood transfusion (23).

Conclusions

The US CDC have reported an outbreak of HPS associated with staying in the 'Signature Tent Cabins' in the Boystown area of Curry Village at Yosemite National Park, California, USA.

During the outbreak period, five hundred and ninety-one EU citizens made bookings for these tent cabins. In total, 1 923 people in booked groups from the EU stayed at the cabins (10 June– 24 August 2012) and were therefore potentially exposed to hantaviruses

The risk of infection among them is low. Only six cases have been confirmed so far among American visitors and none among European visitors, although several thousand people have been in the area.

As HPS is not transmitted from person to person there is no risk to the general public in Europe from this outbreak and there is no need for public health measures to be taken in the event of contact with cases.

As infection with New World hantaviruses causes severe disease, any person presenting with one or more of the abovementioned symptoms of HPS within six weeks of staying at the 'Signature Tent Cabins' in the Yosemite National Park should seek medical advice.

Clinicians are reminded to consider the diagnosis of HPS in all persons presenting with clinically compatible illnesses and to ask about potential rodent exposure or recent visited to Yosemite National Park.

The contact details of EU citizens who booked accommodation in the tent cabins have been provided by the US CDC and the Park authorities to the European Commission. Member States are currently informing them of their potential exposure.

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