

Hantavirus infection

Annual Epidemiological Report for 2020

Key facts

- For 2020, 28 countries reported 1 647 cases of hantavirus infection (0.4 cases per 100 000 population), mainly caused by Puumala virus (98%).
- During the period 2016–2020, the overall notification rate fluctuated between 0.4 and 1.0 cases per 100 00 population, with no obvious long-term trend.
- In 2020, two countries (Finland and Germany) accounted for 85% of all reported cases, with Finland alone accounting for 71% of all cases.
- In the absence of a licenced vaccine, prevention mainly involves rodent control, avoidance of contact with rodent excreta (urine, saliva or droppings), and the proper cleaning and disinfection of areas contaminated by rodent excreta.

Introduction

Hantaviruses are rodent-borne viruses that can be transmitted to humans through contact with faeces/urine from infected rodents or dust containing infective particles. There are several hantaviruses, with varying geographical distributions, causing different clinical diseases. Hantaviruses are usually specific to particular rodent hosts. Three main clinical syndromes can be distinguished after hantavirus infection: haemorrhagic fever with renal syndrome (HFRS), mainly caused by Seoul, Puumala and Dobrava viruses which are prevalent in Europe; nephropathia epidemica, a mild form of HFRS caused by Puumala virus; and hantavirus cardiopulmonary syndrome, which may be caused by Andes virus, Sin Nombre virus, and several others prevalent in the Americas. The clinical presentation varies from subclinical, mild and moderate to severe, depending in part on the causative agent of the disease [1]. In most cases, humans are infected through direct contact with infected rodents or their excreta. There is no curative treatment and eliminating or minimising contact with rodents is the best way to prevent infection.

Methods

This report is based on data for 2020 retrieved from The European Surveillance System (TESSy) on 25 October 2021. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases.

For a detailed description of methods used to produce this report, refer to the *Methods* chapter [2].

An overview of the national surveillance systems is available online [3].

A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [4].

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In 2020, 26 EU/EEA countries reported case-based data and two countries (Belgium and Bulgaria) reported aggregate data. Denmark and Liechtenstein did not report surveillance data on hantavirus infections. In addition, as the United Kingdom (UK) left the EU on 31 January 2020, the country was not included in the data call and consequently did not provide data. Twenty countries used the EU case definition for viral haemorrhagic fevers, four used an alternative case definition, and four did not specify the definition used. Surveillance was comprehensive in all countries except Belgium (sentinel system) and Cyprus (unspecified) and was mostly passive. Belgium, Czechia, Portugal and Slovakia conducted active disease surveillance.

Epidemiology

For 2020, 28 countries reported 1 647 cases, 1 643 (99.8%) of which were classified as confirmed (Table 1). The remaining four (0.2%) cases were reported as probable. Ten countries reported zero cases. In 2020, the number of notifications per 100 000 inhabitants was 0.4, which was same as in 2018, and this was the lowest rate observed during the period 2016–2020.

Two countries (Finland and Germany) accounted for 85% of all reported cases, with Finland alone accounting for 71% of all cases (Table 1). The notification rate was highest in Finland at 21.1 cases per 100 000 population, followed by Estonia at 1.3 cases per 100 000 population (Table 1, Figure 1).

Puumala orthohantavirus (PUUV) was the most commonly identified pathogen, accounting for 1 204 (98.3%) of 1 225 laboratory-confirmed cases with available information on the causative agent. *Hantaan orthohantavirus* (HTNV) was identified in 14 cases (13 in Slovakia and one in Slovenia) and *Dobrava-Belgrade orthohantavirus* (DOBV) in seven cases.

Table 1. Distribution of hantavirus infection cases and rates per 100 000 population by country and year, EU/EEA, 2016–2020

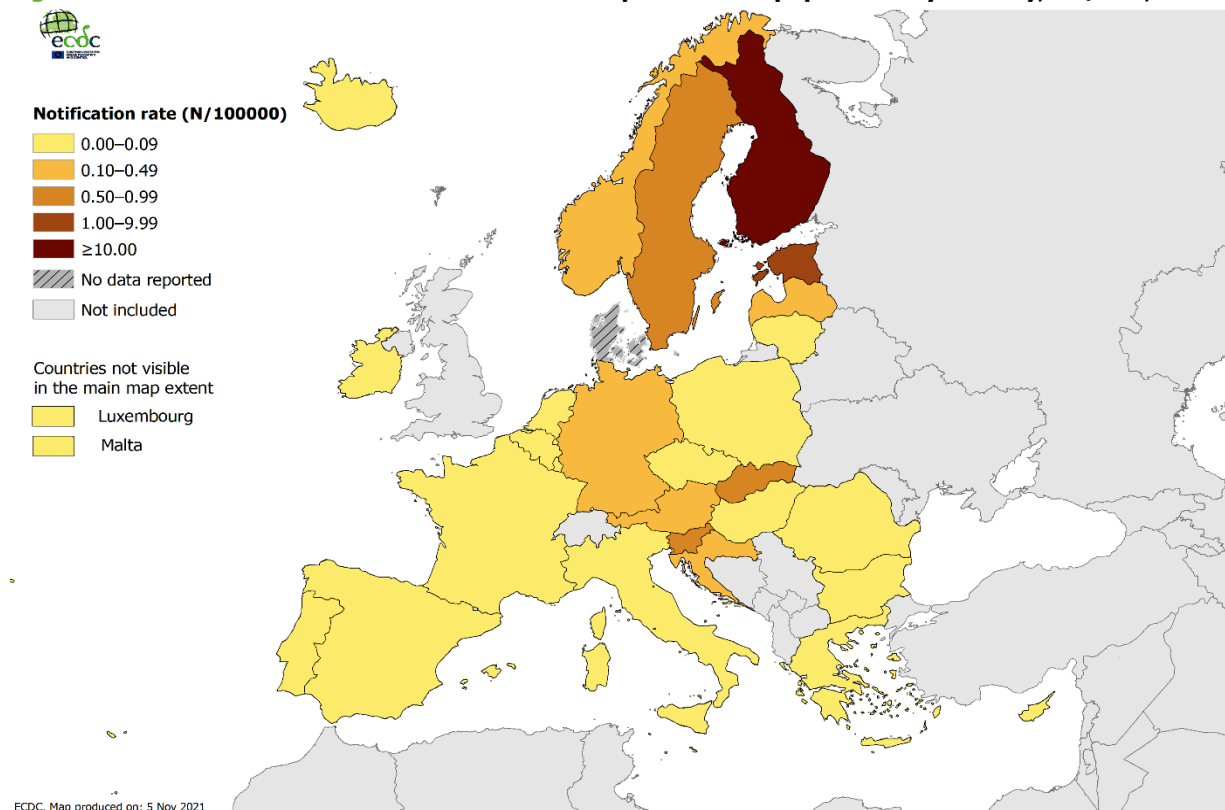
Country	2016		2017		2018		2019		2020	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	30	0.3	90	1.0	24	0.3	276	3.1	30	0.3
Belgium	38	0.3	123	1.1	85	0.7	57	0.5	9	0.1
Bulgaria	10	0.1	8	0.1	7	0.1	6	0.1	1	0.0
Croatia	31	0.7	389	9.4	18	0.4	191	4.7	17	0.4
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Czechia	10	0.1	17	0.2	4	0.0	15	0.1	5	0.0
Denmark	ND	NR	ND	NR	ND	NR	ND	NR	ND	NR
Estonia	11	0.8	26	2.0	15	1.1	26	2.0	17	1.3
Finland	1663	30.3	1246	22.6	999	18.1	1256	22.8	1164	21.1
France	58	0.1	236	0.4	55	0.1	131	0.2	26	0.0
Germany	282	0.3	1731	2.1	235	0.3	1535	1.8	229	0.3
Greece	1	0.0	2	0.0	3	0.0	1	0.0	1	0.0
Hungary	7	0.1	16	0.2	6	0.1	13	0.1	4	0.0
Iceland	ND	NR	ND	NR	0	0.0	0	0.0	0	0.0
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Italy	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Latvia	8	0.4	4	0.2	3	0.2	5	0.3	3	0.2
Liechtenstein	ND	NR	ND	NR	ND	NR	ND	NR	ND	NR
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Luxembourg	1	0.2	15	2.5	0	0.0	8	1.3	0	0.0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Netherlands	2	0.0	6	0.0	1	0.0	0	0.0	0	0.0
Norway	10	0.2	26	0.5	21	0.4	11	0.2	12	0.2
Poland	8	0.0	14	0.0	11	0.0	9	0.0	3	0.0
Portugal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Romania	0	0.0	12	0.1	1	0.0	4	0.0	1	0.0
Slovakia	6	0.1	53	1.0	88	1.6	94	1.7	50	0.9
Slovenia	12	0.6	76	3.7	12	0.6	252	12.1	14	0.7
Spain	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0
Sweden	92	0.9	158	1.6	243	2.4	155	1.5	61	0.6
UK	ND	NR	ND	NR	ND	NR	3	0.0	ND	NR
EU-EEA	2280	0.5	4249	1.0	1831	0.4	4048	0.8	1647	0.4

Source: country reports.

ND: no data reported

NR: no rate calculated.

Figure 1. Distribution of hantavirus infection rates per 100 000 population by country, EU/EEA, 2020



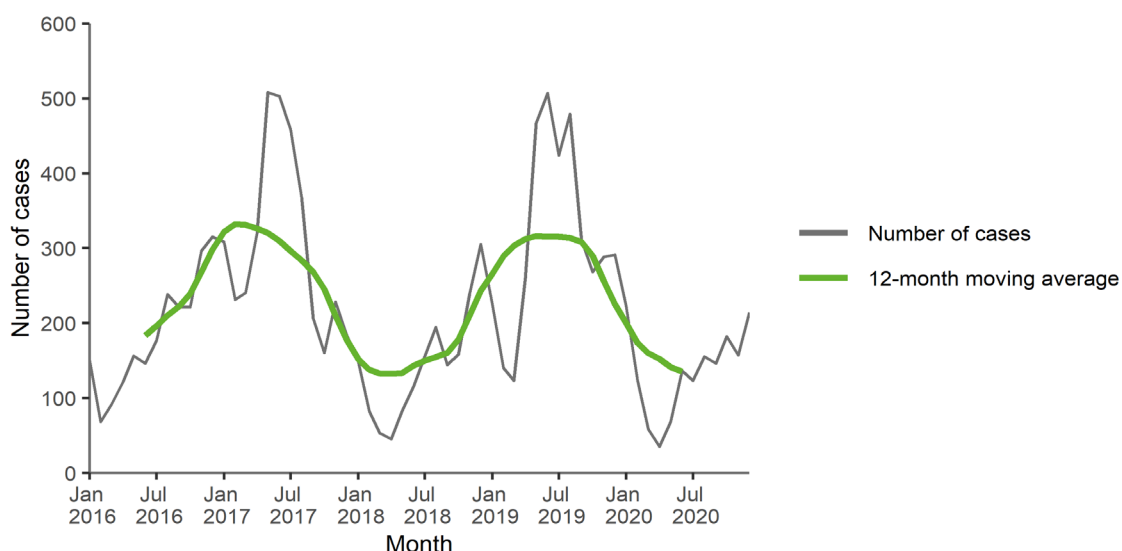
Source: country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

During the period 2016–2020, the number of reported cases ranged from 1 647 in 2020 to 4 249 in 2017, with no obvious trend discernible.

In 2020, countries reported hantavirus cases all year round. However, the number of cases decreased considerably in the period January to April, followed by a steady overall increase from April onwards (Figure 2). In most months, the number of cases was the same or below the minimum recorded in 2016–2019 (Figure 3).

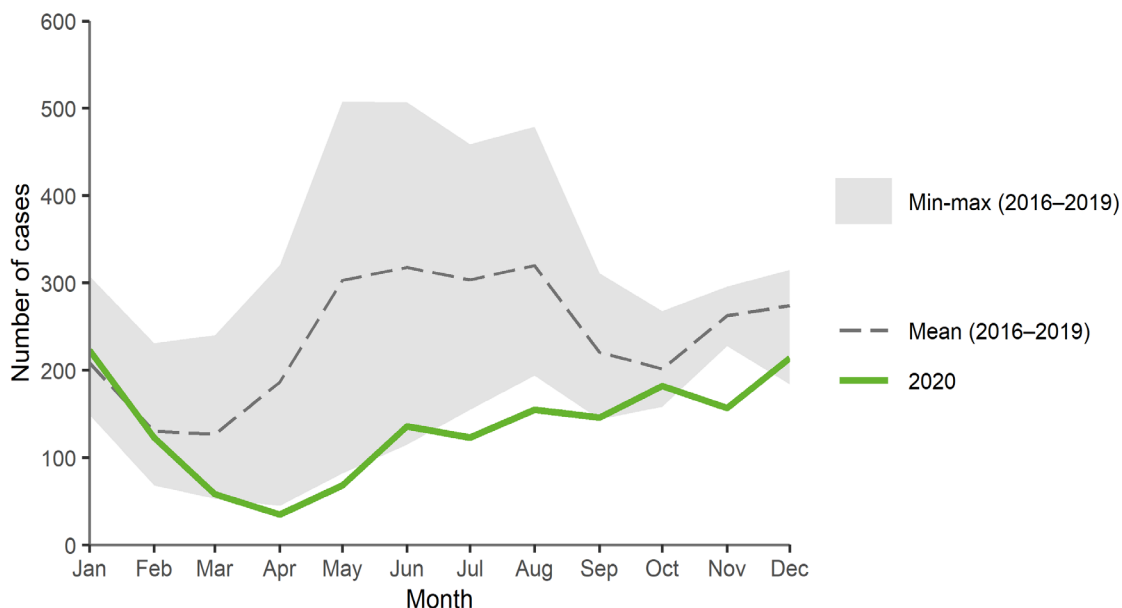
Of the 380 cases with available information on importation status, only one case (0.3%) was travel-associated, with a probable country of infection within the EU/EEA.

Figure 2. Distribution of hantavirus infection cases by month, EU/EEA, 2016–2020



Source: country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

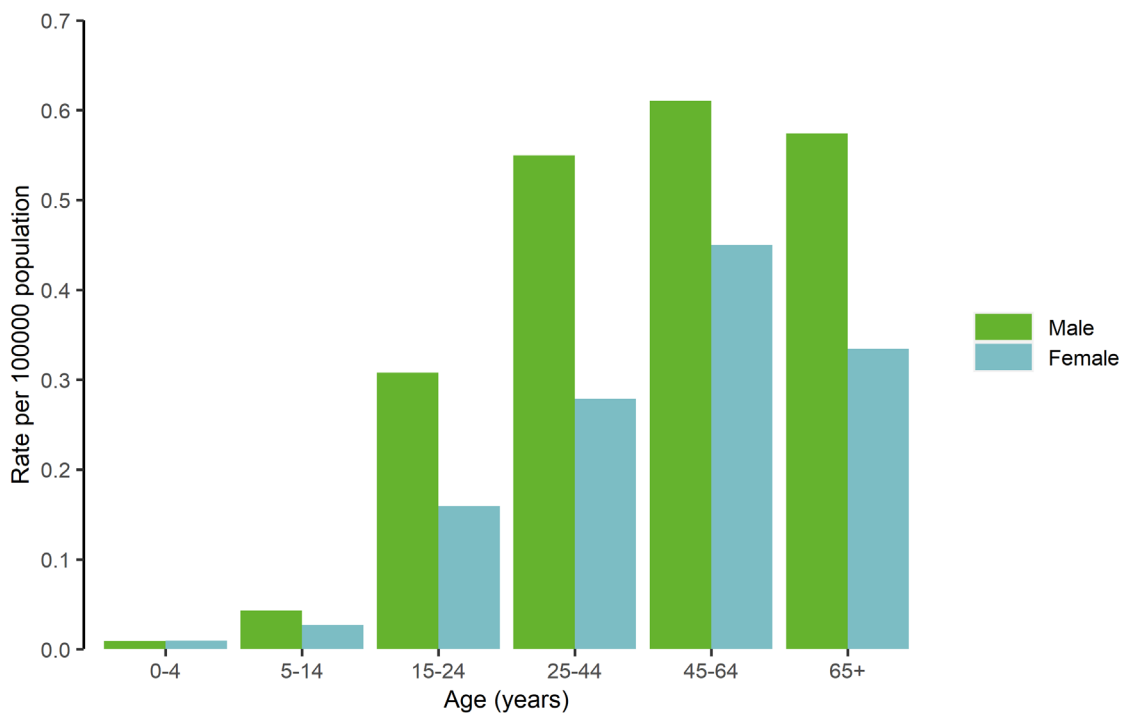
Figure 3. Distribution of hantavirus infection cases by month, EU/EEA, 2020 and 2016–2019



Source: country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

In 2020, people aged 25 years and older accounted for 1 519 (92%) of 1 647 cases with known age (Figure 4). The notification rate was highest among those aged 45–64 years, at 0.5 cases per 100 000 population. In all age groups except for those aged 0–4 years, hantavirus infection was more common in males, with an overall crude male-to-female ratio of 1.5:1. One of the 368 cases reported with known outcome died.

Figure 4. Distribution of hantavirus infection rate per 100 000 population, by age and gender, EU/EEA, 2020



Discussion

In 2020, the number of hantavirus infections in the EU/EEA was the lowest reported for the period 2016–2020, with no evident trend discernible for the whole period. Changing landscape attributes and climatic parameters determining food availability for rodents could explain fluctuations in virus circulation levels [5].

Finland and Germany shaped the patterns observed from 2016 to 2020, accounting for over 74% of annual cases. In northern European countries, an increase in cases during the period November – December is typical because humans come into contact with infected rodents in the countryside more frequently during these months [6]. Similarly, an increase in cases during the summer season corresponds to an increased exposure of urban dwellers during their summer holidays. The main characteristics of the cases reported in 2020 were very similar to those reported during the period 2016–2019. Most cases were infected by PUUV, and the disease mostly affected adults over 25 years of age.

Public health implications

Hantavirus infection is an important cause of potentially preventable disease in Europe. In the absence of a licenced vaccine in Europe, prevention mainly involves rodent control, avoidance of contact with rodent excreta (urine, saliva or droppings), and proper cleaning and disinfection of areas contaminated by rodent excreta [7].

References

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