

Hantavirus infection

Annual Epidemiological Report for 2018

Key facts

- For 2018, 29 countries reported 1 826 cases of hantavirus infection (0.4 cases per 100 000 population), mainly caused by Puumala virus (97%).
- Over the 2014–2018 period, the overall notification rate fluctuated between 0.4 and 0.8 cases per 100 000 population with no obvious long-term trend.
- In 2018, three countries (Finland, Sweden and Germany) accounted for 81% of all reported cases, with Finland alone accounting for 55% of all cases.
- In the absence of a licensed vaccine, prevention mainly relies on rodent control, avoidance of contact with rodent excreta (urine, saliva or droppings), and properly cleaning and disinfecting areas contaminated by rodent excreta.

Methods

This report is based on data for 2018 retrieved from The European Surveillance System (TESSy) on 10 September 2019. 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 [1].

An overview of the national surveillance systems is available online [2].

A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [3].

In 2018, 27 EU/EEA countries reported case-based data and two (Belgium and Bulgaria) reported aggregate data (Denmark and Liechtenstein did not report). Nineteen countries used the EU case definition, five countries used an alternative case definition, and five countries did not specify the definition they used. Surveillance is comprehensive in all countries except Belgium (sentinel system) and is mostly passive. Belgium, Czechia, Portugal, Slovakia and the United Kingdom conduct active disease surveillance.

Suggested citation: European Centre for Disease Prevention and Control. Hantavirus infection. In: ECDC. Annual epidemiological report for 2018. Stockholm: ECDC; 2020.

Stockholm, April 2020

© European Centre for Disease Prevention and Control, 2019. Reproduction is authorised, provided the source is acknowledged.

Epidemiology

For 2018, 29 countries reported 1 826 cases, 1 815 (99.4%) of which were classified as confirmed (Table 1). The remaining eleven (0.6%) cases were reported as probable. Eleven countries reported zero cases. The number of notifications per 100 000 inhabitants was 0.4 in 2018, similar to 2016, which had been the lowest rate observed over the past five years.

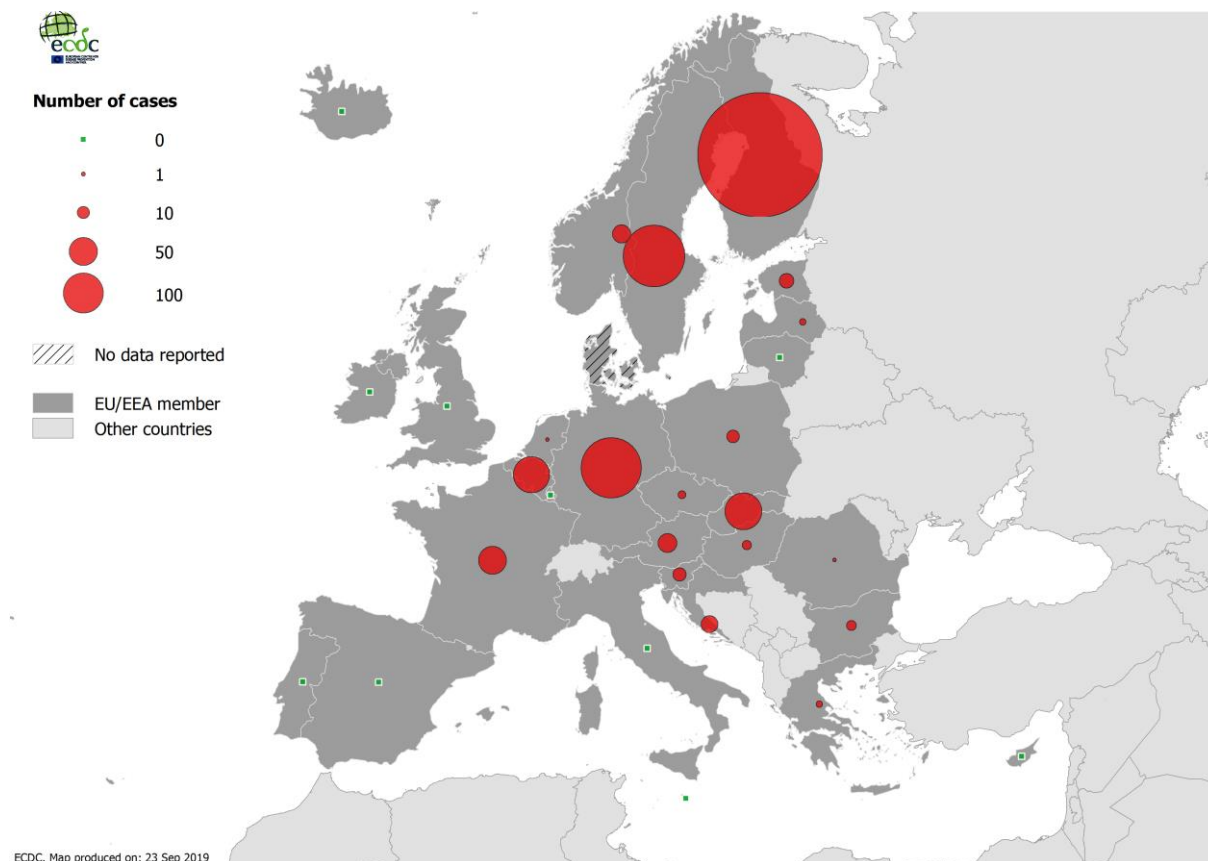
Three countries (Finland, Sweden and Germany) accounted for 80.9% of all reported cases, with Finland alone accounting for 54.7% (Table 1, Figure 1). The notification rate was highest in Finland at 18.1 cases per 100 000 population, followed by Sweden, Slovakia and Estonia.

Puumala virus (PUUV) was the most commonly identified pathogen, accounting for 1 278 (97.3%) of 1 313 laboratory-confirmed cases with available information. Hantaan virus (HTNV) was identified in 26 cases (all in Slovakia) and Dobrava virus (DOBV) in nine cases (five in Slovenia and four in Hungary). No cases of Saaremaa virus (SAAV) were reported.

Table 1. Distribution of Hantavirus infection cases and rates per 100 000 population by country and year, EU/EEA, 2014–2018

Country	2014		2015		2016		2017		2018		
	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Confirmed cases
Austria	78	0.9	22	0.3	30	0.3	90	1.0	24	0.3	24
Belgium	74	0.7	44	0.4	38	0.3	123	1.1	85	0.7	85
Bulgaria	9	0.1	1	0.0	10	0.1	8	0.1	7	0.1	6
Croatia	209	4.9	10	0.2	31	0.7	389	9.4	18	0.4	12
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Czechia	3	0.0	7	0.1	10	0.1	17	0.2	4	0.0	4
Estonia	26	2.0	14	1.1	11	0.8	26	2.0	15	1.1	15
Finland	2089	38.3	1463	26.7	1663	30.3	1246	22.6	999	18.1	999
France	105	0.2	142	0.2	58	0.1	236	0.4	50	0.1	50
Germany	574	0.7	829	1.0	281	0.3	1731	2.1	235	0.3	235
Greece	2	0.0	1	0.0	1	0.0	2	0.0	3	0.0	3
Hungary	6	0.1	9	0.1	7	0.1	16	0.2	6	0.1	6
Iceland	-	-	-	-	-	-	-	-	0	0.0	0
Ireland	0	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
Latvia	6	0.3	0	0.0	8	0.4	4	0.2	3	0.2	2
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Luxembourg	3	0.5	13	2.3	1	0.2	15	2.5	0	0.0	0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Netherlands	1	0.0	1	0.0	2	0.0	6	0.0	1	0.0	0
Norway	42	0.8	11	0.2	10	0.2	26	0.5	21	0.4	21
Poland	54	0.1	6	0.0	8	0.0	14	0.0	11	0.0	9
Portugal	-	-	0	0.0	0	0.0	0	0.0	0	0.0	0
Romania	14	0.1	6	0.0	0	0.0	12	0.1	1	0.0	1
Slovakia	14	0.3	21	0.4	6	0.1	53	1.0	88	1.6	88
Slovenia	25	1.2	8	0.4	12	0.6	76	3.7	12	0.6	12
Spain	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0
Sweden	418	4.3	285	2.9	92	0.9	158	1.6	243	2.4	243
United Kingdom	5	0.0	4	0.0	0	0.0	0	0.0	0	0.0	0
EU/EEA	3757	0.8	2897	0.6	2279	0.4	4249	0.8	1826	0.4	1815

Source: country reports.

Figure 1. Distribution of Hantavirus infection cases by country, EU/EEA, 2018

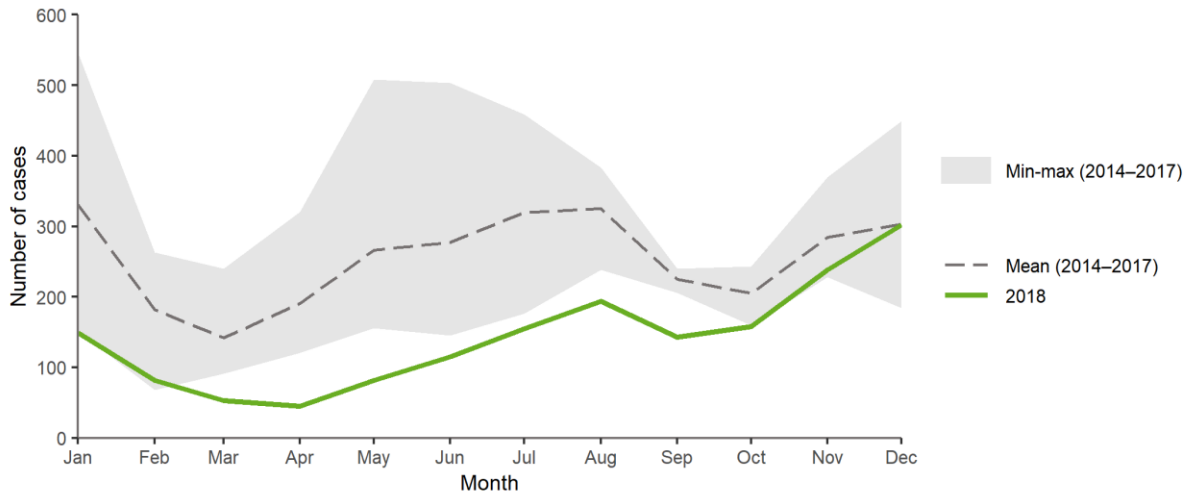
Source: Country reports from Austria, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

Over the 2014–2018 period, the number of reported cases ranged from 1 826 in 2018 to 4 249 in 2017, with no obvious trend discernible.

In 2018, countries reported hantavirus cases all year round, but there was a small peak in August followed by a larger one in December (Figure 2). In most months, the number of cases was below the minimum recorded in 2014–2017.

Of the 667 cases with available information on importation status, eight (1%) were travel associated. Of the six travel-associated cases with known probable country of infection, three (50%) were infected in the EU/EEA.

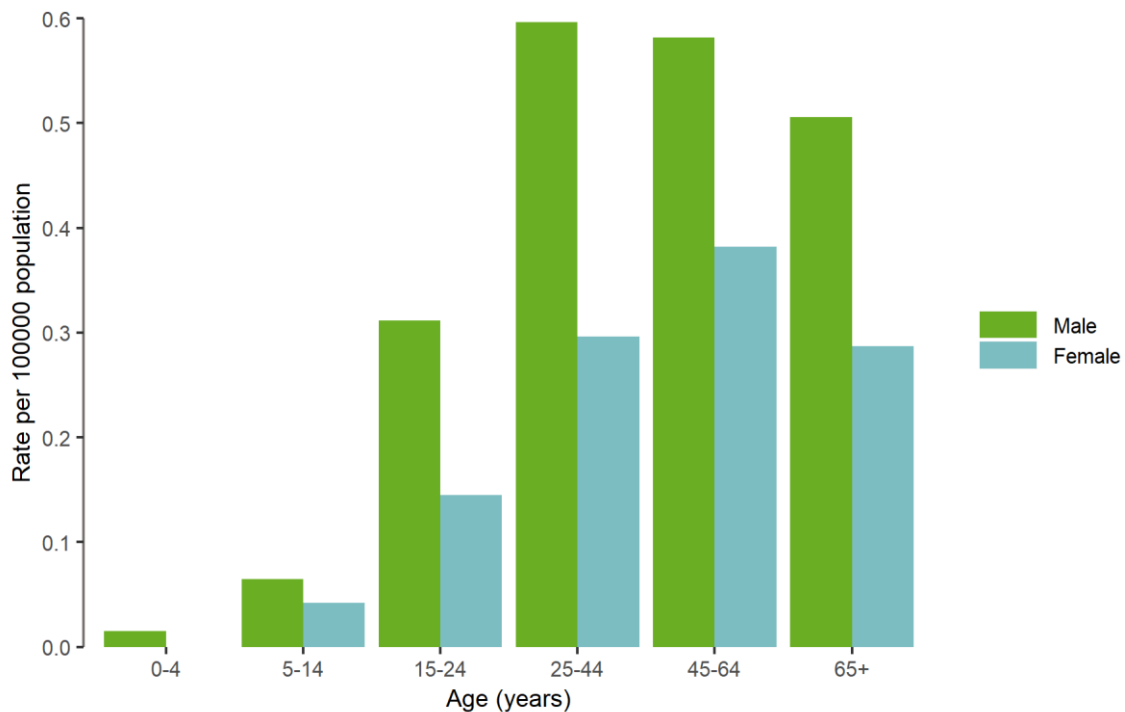
Figure 2. Distribution of Hantavirus infection cases by month, EU/EEA, 2018 and 2014–2017



Source: Country reports from Austria, Cyprus, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Malta, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

In 2018, people aged 25 years and older accounted for 1 667 (91%) of 1 826 cases with known age (Figure 3). The notification rate peaked in those aged 45–64 years at 0.6 cases per 100 000 population. In all age groups, hantavirus infection was more common in males, with an overall crude male-to-female ratio of 1.6:1. Two of the 428 cases reported with known outcome died, one probable case in Poland and one confirmed case, but with unknown causative pathogen, in Latvia.

Figure 3. Distribution of Hantavirus infection cases per 100 000 population, by age and gender, EU/EEA, 2018



Discussion

Hantaviruses circulating in Europe can cause haemorrhagic fever with renal syndrome. The clinical presentation varies from subclinical, mild, and moderate to severe, depending in part on the causative agent of the disease [4]. In most cases, humans are infected through direct contact with infected rodents or their excreta. In 2018, the number of hantavirus infections in the EU/EEA was lower than in the previous four years. However, there was no evident trend in the 2014–2018 period. Changing landscape attributes and climatic parameters determining food availability for rodents could explain fluctuations in virus circulation levels.

Finland and Sweden shaped the patterns observed from 2014 to 2018, accounting for over 60% of annual cases, except for 2017, when an epidemic in western and central Europe dominated the overall pattern observed, resulting in a peak in May. A November/December peak is typical for northern Europe because humans come more into contact with infected rodents in the countryside during these months [7]. Similarly, the August peak corresponds to increased exposure of urban dwellers during their summer holidays. The main characteristics of the cases reported in 2018 were very similar to those reported during 2014–2017. Most cases were infected by PUUV, and the disease mostly affected adults over 25 years of age.

In 2018, the five most commonly reported serogroups were O157, O26, O103, O91 and O145.

Public health implications

Hantavirus infection is an important cause of potentially preventable morbidity in Europe. In the absence of a licensed vaccine in Europe, prevention mainly relies on rodent control, avoidance of contact with rodent excreta (urine, saliva or droppings), and properly cleaning and disinfecting areas contaminated by rodent excreta [4].

In 2014, ECDC published a report summarising preventive measures and communication strategies for hantavirus infection in Europe [8].

References

1. European Centre for Disease Prevention and Control. Introduction to the Annual Epidemiological Report [internet]. Stockholm: ECDC; 2017 [cited 11 December 2019]. Available from: <http://ecdc.europa.eu/annual-epidemiological-reports/methods>
2. European Centre for Disease Prevention and Control. Surveillance systems overview for 2017 [internet, downloadable spreadsheet]. Stockholm: ECDC; 2019 [cited 11 December 2019]. Available from: <http://ecdc.europa.eu/publications-data/surveillance-systems-overview-2018>
3. European Centre for Disease Prevention and Control. Surveillance atlas of infectious diseases [internet]. Stockholm: ECDC; 2019 [cited 12 December 2019]. Available from: <http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&HealthTopic=24>.
4. Avšič-Županc T, Saksida A, Korva M. Hantavirus infections. *Clin Microbiol Infect*. 2019 Apr;21S:e6-e16.
5. Reusken C, Heyman P. Factors driving hantavirus emergence in Europe. *Curr Opin Virol*. 2013 Feb;3(1):92-9.
7. Jonsson CB, Figueiredo LT, Vapalahti O. A global perspective on hantavirus ecology, epidemiology, and disease. *Clin Microbiol Rev*. 2010 Apr;23(2):412-41.
8. European Centre for Disease Prevention and Control. Prevention measures and communication strategies for hantavirus infection in Europe. ECDC: Stockholm; 2014.