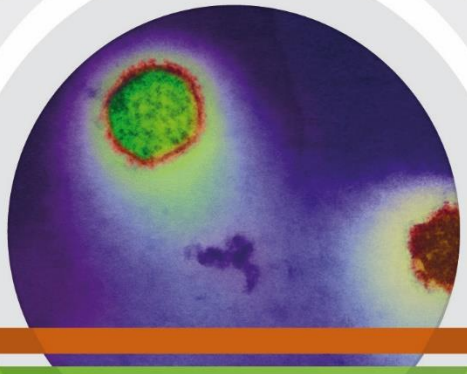

SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Hantavirus infection

Key facts

- In 2016, 18 countries reported 2 190 cases of hantavirus infection (0.4 cases per 100 000 population), mainly caused by Puumala virus (>99%).
- The overall notification rate fluctuated between 0.4 and 1.1 cases per 100 000 population over the 2012 to 2016 period, with no obvious long-term trend.
- In 2016, two countries, Finland and Germany, accounted for 88.8% of all reported cases, with Finland alone accounting for 75.9% of all cases.
- In the absence of a licensed vaccine, rodent control and avoidance of contact with contaminated areas are the most effective preventive measures.

Methods

This report is based on data for 2016 retrieved from The European Surveillance System (TESSy) on 4 April 2018. 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, please 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 2016, 24 EU/EEA countries reported case-based data and three reported aggregate data, while Denmark, Iceland, Liechtenstein and Malta did not report. Seventeen countries used the EU case definition, five countries used an alternative case definition and five countries did not specify which definition they used. Surveillance is comprehensive in all countries except Belgium, which has a sentinel system and is mostly passive. Belgium, the Czech Republic, Portugal, Slovakia and the United Kingdom conduct active disease surveillance.

Epidemiology

In 2016, 18 countries reported 2 190 cases, 2 183 (99.7%) of which were classified as confirmed. The remaining seven cases (0.3%) were reported as probable (Table 1). Nine countries reported no cases. The number of

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notifications per 100 000 inhabitants was 0.4 in 2016, similar to 2013, which was the lowest observed over the past five years.

Two countries, Finland and Germany, accounted for 88.8% of all reported cases, with Finland alone accounting for 75.9% of all cases. Notification rates were below one case per 100 000 population in all countries except Finland, where it reached 30.3 cases per 100 000 population.

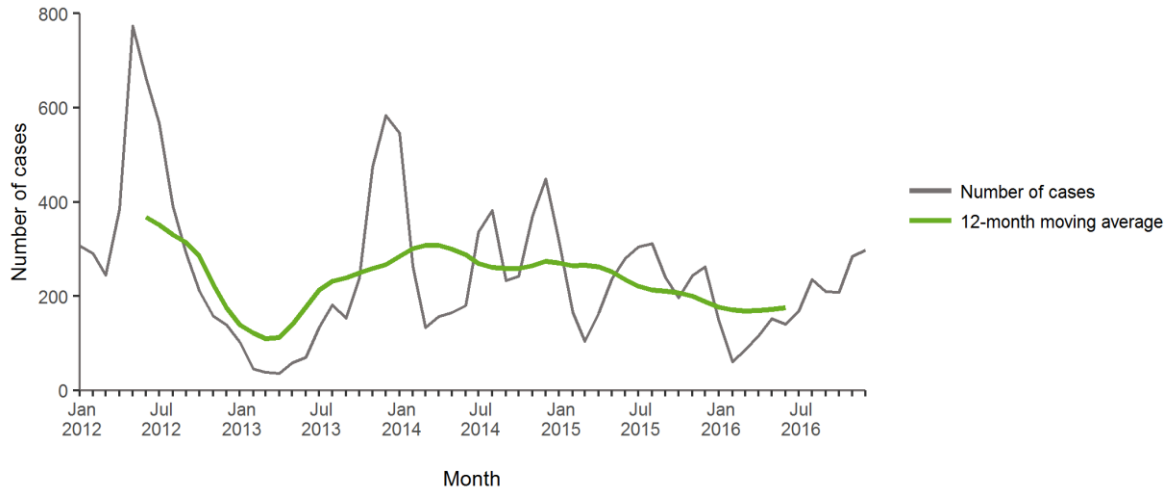
Puumala virus (PUUV) was the most commonly identified pathogen, accounting for 1 715 of 1 728 (99.2%) of laboratory-confirmed cases with available information. The causative pathogen was Dobrava virus (DOBV) for six cases (one in Austria, three in Hungary and two in Poland), Hantaan virus (HTNV) for six cases (one in Estonia, two in Slovakia and three in Slovenia) and Saaremaa virus (SAAV) for one case reported by Austria.

Table 1. Distribution of hantavirus infection cases, EU/EEA, 2012 to 2016

	2012		2013		2014		2015		2016		
Country	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Confirmed cases
Austria	219	2.6	35	0.4	74	0.9	22	0.3	30	0.3	28
Belgium	151	1.4	24	0.2	76	0.7	47	0.4	41	0.4	41
Bulgaria	3	0.0	15	0.2	9	0.1	1	0.0	10	0.1	9
Croatia	154	3.6	6	0.1	209	4.9	10	0.2	31	0.7	31
Cyprus	.	.	0	0.0	0	0.0	0	0.0	0	0.0	0
Czech Republic	9	0.1	12	0.1	3	0.0	7	0.1	10	0.1	10
Denmark	.	.	.	.	.	.	.	.	.	.	.
Estonia	19	1.4	19	1.4	26	2.0	14	1.1	11	0.8	11
Finland	841	15.6	1685	31.1	2089	38.3	1 463	26.7	1 663	30.3	1 663
France	164	0.3	15	0.0	105	0.2	142	0.2	58	0.1	58
Germany	2 825	3.5	161	0.2	573	0.7	829	1.0	281	0.3	281
Greece	1	0.0	2	0.0	2	0.0	1	0.0	1	0.0	1
Hungary	8	0.1	2	0.0	6	0.1	9	0.1	7	0.1	5
Iceland	.	.	.	.	.	.	.	.	.	.	.
Ireland	1	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0
Italy	.	.	0	0.0	0	0.0	.	.	0	0.0	0
Latvia	12	0.6	8	0.4	6	0.3	0	0.0	8	0.4	8
Lithuania	0	0.0		0.0	0	0.0	0	0.0	0	0.0	0
Luxembourg	23	4.4	0	0.0	3	0.5	13	2.3	1	0.2	1
Malta	0	0.0	0	0.0	0	0.0	.	.	.	.	.
Netherlands	0	0.0	1	0.0	1	0.0	1	0.0	2	0.0	0
Norway	13	0.3	19	0.4	42	0.8	11	0.2	10	0.2	10
Poland	3	0.0	8	0.0	54	0.1	6	0.0	8	0.0	8
Portugal	.	.	.	.	.	.	0	0.0	0	0.0	0
Romania	3	0.0	4	0.0	14	0.1	6	0.0	0	0.0	0
Slovakia	6	0.1	14	0.3	14	0.3	21	0.4	6	0.1	6
Slovenia	182	8.9	6	0.3	25	1.2	8	0.4	12	0.6	12
Spain	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Sweden	48	0.5	119	1.2	418	4.3	285	2.9	0	0.0	0
United Kingdom	1	0.0	4	0.0	5	0.0	4	0.0	0	0.0	0
EU/EEA	**4 686**	**1.1**	**2 160**	**0.4**	**3 754**	**0.8**	**2 900**	**0.6**	**2 190**	**0.4**	**2 183**

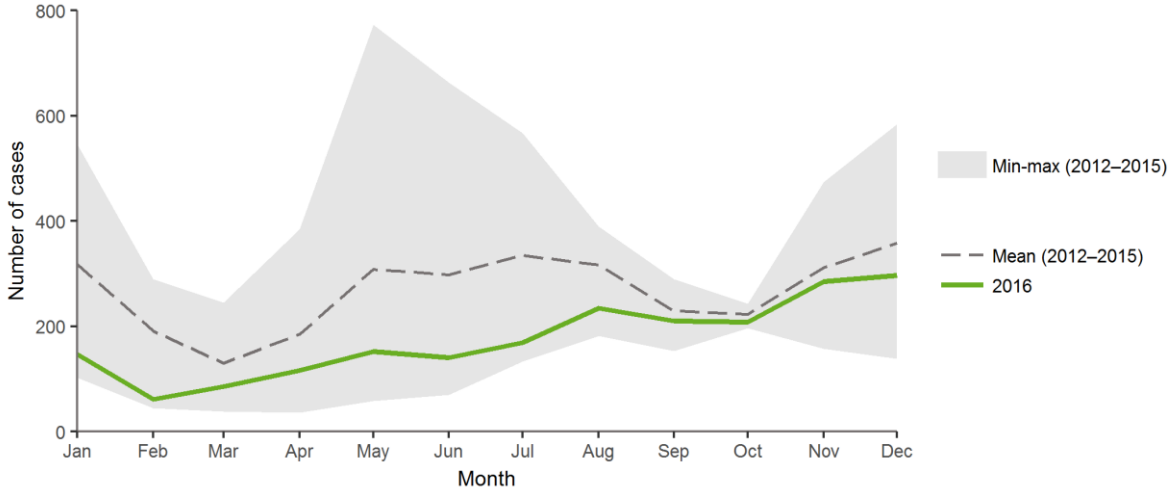
Source: Country reports.
.: No data reported.

Figure 1. Distribution of hantavirus infection cases by month, EU/EEA, 2012 to 2016



Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.

Figure 2. Distribution of Hantavirus infection cases by month, EU/EEA, 2016 and 2012 to 2015



Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.

Over the 2012 to 2016 period, the number of reported cases ranged from 2 160 in 2013 to 4 686 in 2012, with no obvious trend. The highest peak was observed in May 2012, when countries reported 773 cases, of which 621 (80.3%) were reported by Germany. The second highest peak was in January 2014 when countries reported 546 cases, of which 468 (85.7%) were reported by Finland.

In 2016, countries reported hantavirus cases all year round, but most cases (66.7%) had a date of reporting between July and December. A first peak was observed in August and a second in November to December.

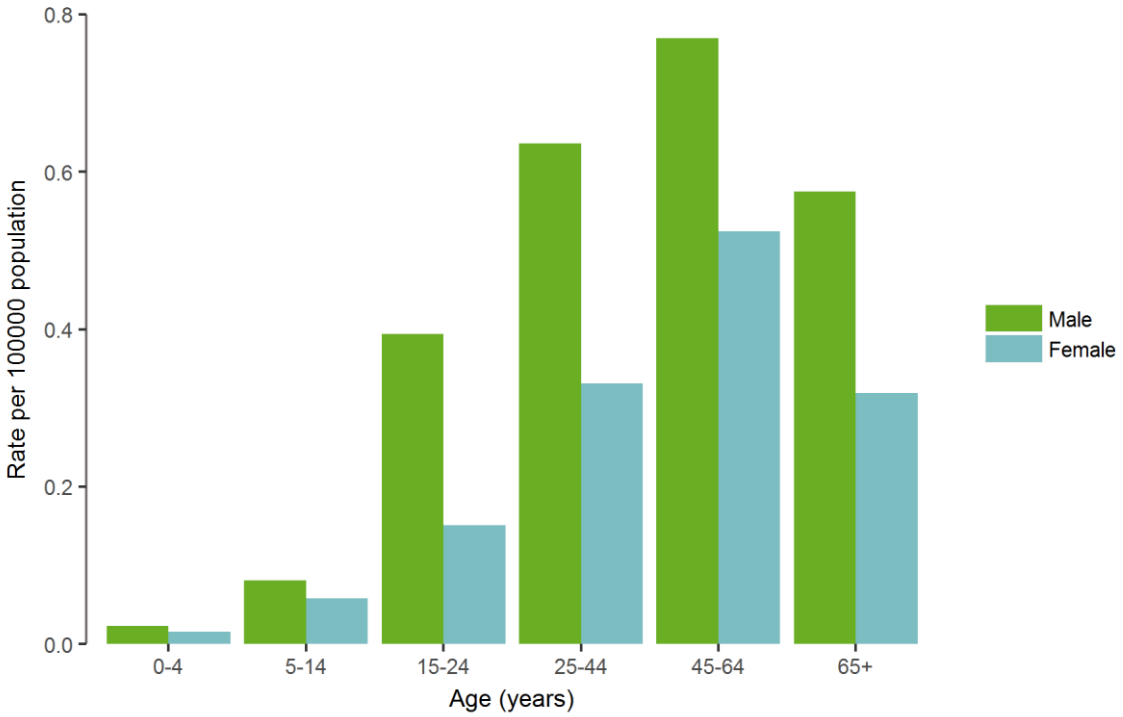
Of the 379 cases with available information on importation status, 16 (4.2%) were travel-associated. None of the cases reported by Finland had information on importation status. Of the 16 travel-associated cases, 13 (81.3%) were reported by Germany. Of the 15 travel-associated cases with known probable country of infection, 12 (80%) were infected in the EU/EEA, one in Bosnia and Herzegovina, one in Syria and one in Turkey.

Figure 3. Distribution of hantavirus infection cases by country, EU/EEA, 2016

Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.

In 2016, people aged 25 years and older accounted for 1 963 (90.9%) of 2 159 cases with known age. The notification rate peaked in those aged 45–64 years at 0.64 cases per 100 00 population. Hantavirus infection was more common in males in all age groups, with an overall crude male-to-female rate ratio of 1.6:1. None of the 357 cases reported with known outcome died, including all cases infected by DOBV.

Figure 4. Distribution of hantavirus infection cases per 100 000 population, by age and gender, EU/EEA, 2016



Discussion

Hantaviruses circulating in Europe (mostly PUUV, but also DOBV in the Balkans and SAAV in Central and Eastern Europe) cause haemorrhagic fever with renal syndrome (HFRS) [4]. In most cases, humans are infected after direct contact with infected rodents or their excreta.

In 2016, both the number and notification rate of hantavirus infection in the EU/EEA were lower than in previous years, especially in 2012 and 2014, when countries reported large numbers of cases. However, there was no obvious trend over the 2012 to 2016 period. Changing landscape attributes and climatic parameters associated with food availability for rodents and virus survival could partly explain fluctuations in hantavirus infection epidemiology [5]. Except for 2012, when a large outbreak occurred in Germany [6], Finland's data shaped the patterns observed over the 2012 to 2016 period. Thus, the November to December peak is typical of Northern European epidemics because infected rodents come into more contact with humans 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 2016 were very similar to those reported in previous years. Most cases were infected by PUUV and the disease mostly affected adults aged over 25 years. None of the cases with known outcome died. While both PUUV and SAAV cause mild forms of the disease with mortality rates <1%, DOBV causes more severe forms, with mortality rates of 5% to 15% [4].

Public health implications

Hantavirus infection is an important cause of potentially preventable morbidity in Europe, with between 2 000 and 5 000 cases reported annually, mostly in Finland and Germany.

In the absence of a licensed vaccine in Europe, prevention mainly relies on rodent control and avoidance of contact with contaminated areas [4]. ECDC has published a report summarising preventive measures and communication strategies for hantavirus infection in Europe [8].

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