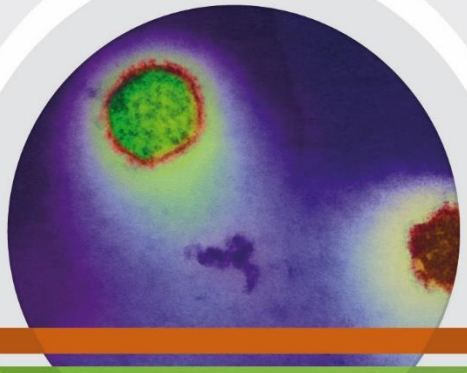


SURVEILLANCE REPORT

Annual Epidemiological Report for 2015

Hantavirus infection

Key facts

- 2 889 confirmed cases were reported to TESSy in 2015.
- The notification rate was 0.6 cases per 100 000 population.
- Hantavirus infections are widely distributed across Europe, with the exception of some Mediterranean countries that report very low numbers of cases.

Methods

This report is based on data for 2015 retrieved from The European Surveillance System (TESSy) on 30 June 2017. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases. EU Member States and EEA countries contribute to the system by uploading their infectious disease surveillance data at regular intervals [1].

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

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

Twenty-six EU/EEA countries reported cases, while six countries (Cyprus, Ireland, Latvia, Lithuania, Portugal and Spain) reported zero cases. Data were not available from Denmark, Iceland, Italy, Liechtenstein and Malta.

Seventeen countries used the EU case definition. An alternative case definition was used by the Czech Republic, France, Germany, Poland and the United Kingdom. Belgium, Cyprus, Finland and Ireland did not specify their definition or it was unknown.

Reporting is voluntary in four countries and compulsory in 21 and not specified in Cyprus. The surveillance systems are mostly passive, except in Belgium, the Czech Republic, Portugal, Slovakia and the United Kingdom where active systems are in place. Systems are mostly case-based, except in Belgium, Croatia and Bulgaria [2].

Suggested citation: European Centre for Disease Prevention and Control. Hantavirus infection. In: ECDC. Annual epidemiological report for 2015. Stockholm: ECDC; 2017.

Stockholm, December 2017

Epidemiology

In 2015, 2 891 cases were reported, 2 889 (99.9%) of which were confirmed. This was a 23% decrease from 2014 when 3 754 cases were recorded. Most of the cases (93.7%) were reported from four countries (Finland, France, Germany and Sweden), with Finland reporting 50.6% of all cases (Figure 1). In 2014, most of the cases (90.4%) were reported from five countries (Croatia, Finland, France, Germany and Sweden), with Finland reporting 55.6% of the cases. Over the last years, large variations were noted in the number of reported cases, and since 2008 a peak has been observed every other year.

The case notification rate was 0.6 cases per 100 000 population, lower than the rate reported in 2014 (0.8 cases per 100 000 population, but higher than in 2013 (0.4 cases per 100 000 population).

The notification rate in Finland was high throughout the period 2010–2015, with the highest rate in 2014 (38.3 cases per 100 000 population). In 2015, the notification rate dropped to 26.7, which is lower than in 2014 and 2013. Germany had a higher notification rate in 2015 (1.0 cases per 100 000 population) than in 2014 (0.7 cases) and 2013 (0.2 cases), but much lower than in 2012 (3.5 cases) when a large outbreak occurred. The notification rate for Sweden decreased from 4.3 cases per 100 000 population in 2014 to 2.9 cases in 2015 (Table 1).

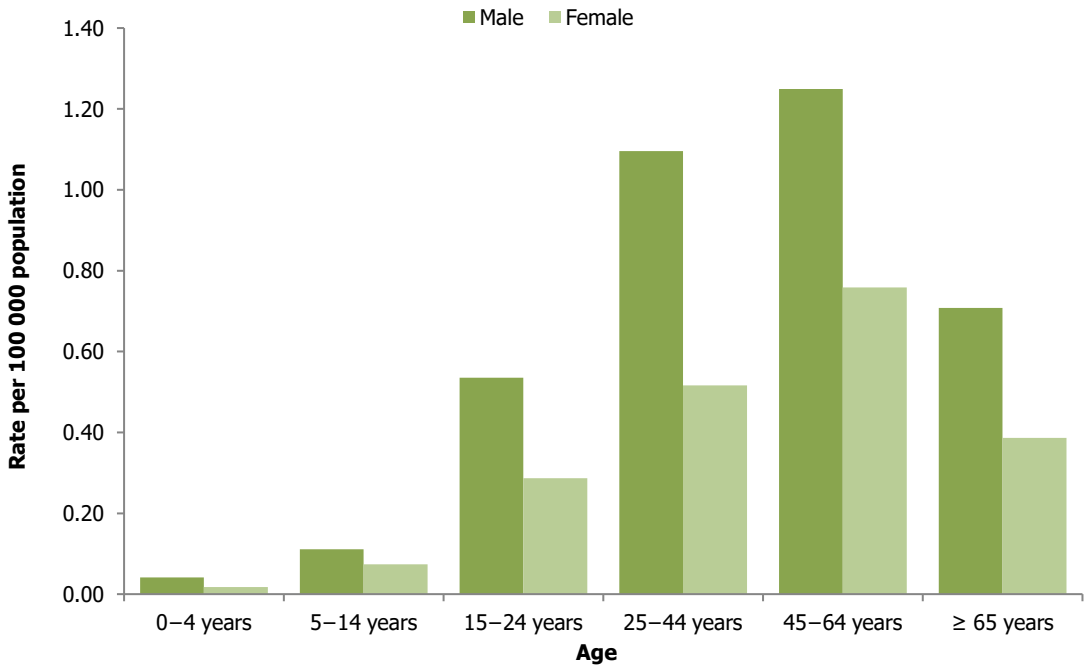
Table 1. Distribution of number and rate per 100 000 of reported hantavirus infection cases by country and year, EU/EEA, 2011–2015

Country	2011		2012		2013		2014		2015				
	Reported cases		Reported cases		Reported cases		Reported cases		National coverage	Reported cases			Confirmed cases
	Number	Rate	Number	Rate	Number	Rate	Number	Rate		Number	Rate	ASR	
Austria	36	0.4	219	2.6	35	0.4	74	0.9	Y	22	0.3	0.3	22
Belgium	132	1.2	151	1.4	24	0.2	76	0.7	Y	47	0.4	0.4	47
Bulgaria	3	0.0	3	0.0	15	0.2	9	0.1	Y	1	0.0	0.0	1
Croatia	.	.	154	3.6	6	0.1	209	4.9	Y	10	0.2	0.2	10
Cyprus	.	.	.	.	0	0.0	0	0.0	Y	0	0.0	0.0	0
Czech Republic	9	0.1	9	0.1	12	0.1	3	0.0	Y	7	0.1	0.1	7
Denmark	.	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	12	0.9	19	1.4	19	1.4	26	2.0	Y	14	1.1	1.1	14
Finland	1834	34.1	841	15.6	1685	31.1	2089	38.3	Y	1463	26.7	26.9	1463
France	101	0.2	164	0.3	15	0.0	105	0.2	Y	133	0.2	0.2	133
Germany	305	0.4	2825	3.5	161	0.2	573	0.7	Y	829	1.0	1.0	829
Greece	3	0.0	1	0.0	2	0.0	2	0.0	Y	1	0.0	0.0	1
Hungary	7	0.1	8	0.1	2	0.0	6	0.1	Y	9	0.1	0.1	8
Ireland	0	0.0	1	0.0	1	0.0	0	0.0	Y	0	0.0	0.0	0
Italy	.	.	.	.	0	0.0	0	0.0	.	.	.	.	.
Latvia	4	0.2	12	0.6	8	0.4	6	0.3	Y	0	0.0	0.0	0
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0.0	0.0	0
Luxembourg	0	0.0	23	4.4	0	0.0	3	0.5	Y	13	2.3	2.4	13
Malta	0	0.0	0	0.0	0	0.0	0	0.0	.	.	.	.	.
Netherlands	0	0.0	0	0.0	1	0.0	1	0.0	Y	1	0.0	0.0	1
Poland	8	0.0	3	0.0	8	0.0	54	0.1	Y	6	0.0	0.0	6
Portugal	.	.	.	.	.	.	.	.	Y	0	0.0	0.0	0
Romania	4	0.0	3	0.0	4	0.0	14	0.1	Y	6	0.0	0.0	6
Slovakia	3	0.1	6	0.1	14	0.3	14	0.3	Y	21	0.4	0.4	21
Slovenia	17	0.8	182	8.9	6	0.3	25	1.2	Y	8	0.4	0.4	7
Spain	0	0.0	0	0.0	0	0.0	0	0.0	Y	0	0.0	0.0	0
Sweden	351	3.7	48	0.5	119	1.2	418	4.3	Y	285	2.9	2.9	285
United Kingdom	0	0.0	1	0.0	4	0.0	5	0.0	Y	4	0.0	0.0	4
EU	2829	0.7	4673	1.1	2141	0.4	3712	0.8	.	2880	0.7	0.7	2878
Iceland	.	.	.	.	.	.	.	.	.	.	.	.	.
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.
Norway	39	0.8	13	0.3	19	0.4	42	0.8	Y	11	0.2	0.2	11
EU/EEA	2868	0.7	4686	1.1	2160	0.4	3754	0.8	.	2891	0.6	0.6	2889

Source: Country reports. Legend: Y = yes, N = no, C = case based, - = no report, ASR: age-standardised rate

Figure 1. Distribution of reported hantavirus infection cases by Member States, EU/EEA, 2015

Figure 2. Distribution of reported hantavirus infection cases per 100 000 population, by age and gender, EU/EEA, 2015



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

Age and gender distribution

The incidence of hantavirus infection was higher among males (0.8 cases per 100 000 population) than among females (0.5 cases per 100 000 population). The male-to-female ratio was 1.7:1, similar to 2014. Hantavirus infections were predominantly reported in adults, with 78.7% of cases in the age groups 25–44 and 45–64 years.

A few cases were reported in children (n=51, 1.7% of the cases), with a rate of 0.03 cases per 100 000 population in the 0–4-year age group, and 0.1 cases per 100 000 population for the 5–14-year-olds.

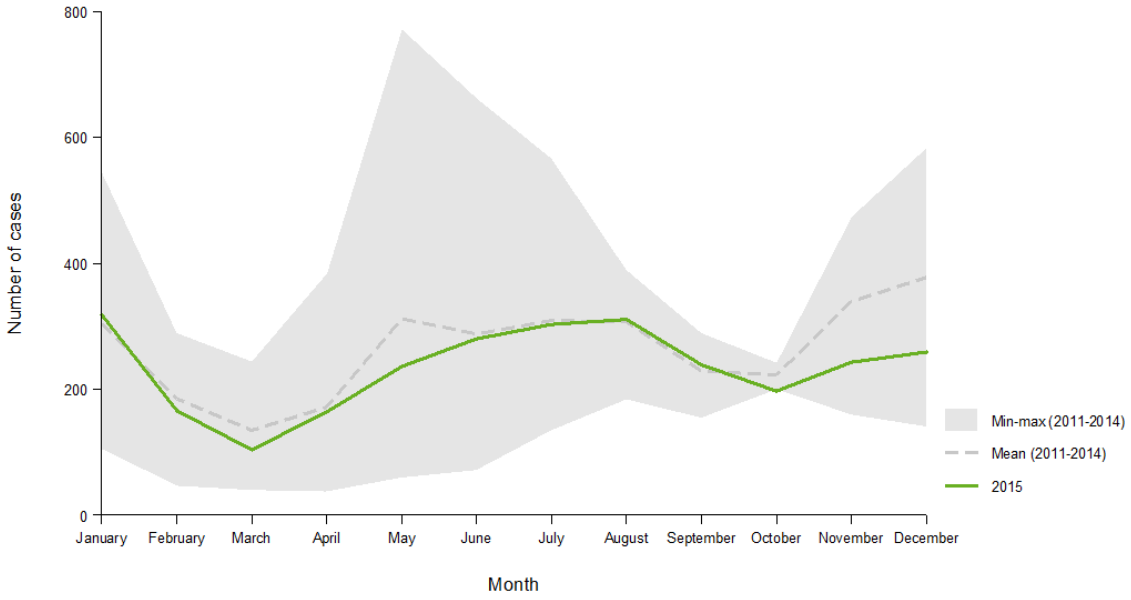
Seasonality

In 2015, hantavirus cases were reported all year round, with a peak in January (n=318 cases), which represents 11% of all cases with information about calendar month, and an increase in July and August (n=614 cases; 21.2% of all cases in 2015 with information about month). The lowest number of cases was reported between February and April.

This trend is similar to the one observed in 2014 and previous years (Figure 3).

The highest number of cases in Finland in 2015 was reported in December (14%) and in August (12.8%).

Figure 3. Seasonal distribution of reported hantavirus infection cases, EU/EEA, 2015 compared with 2011−2015 (minimum–maximum)



Source: Country reports from the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Enhanced surveillance in 2015

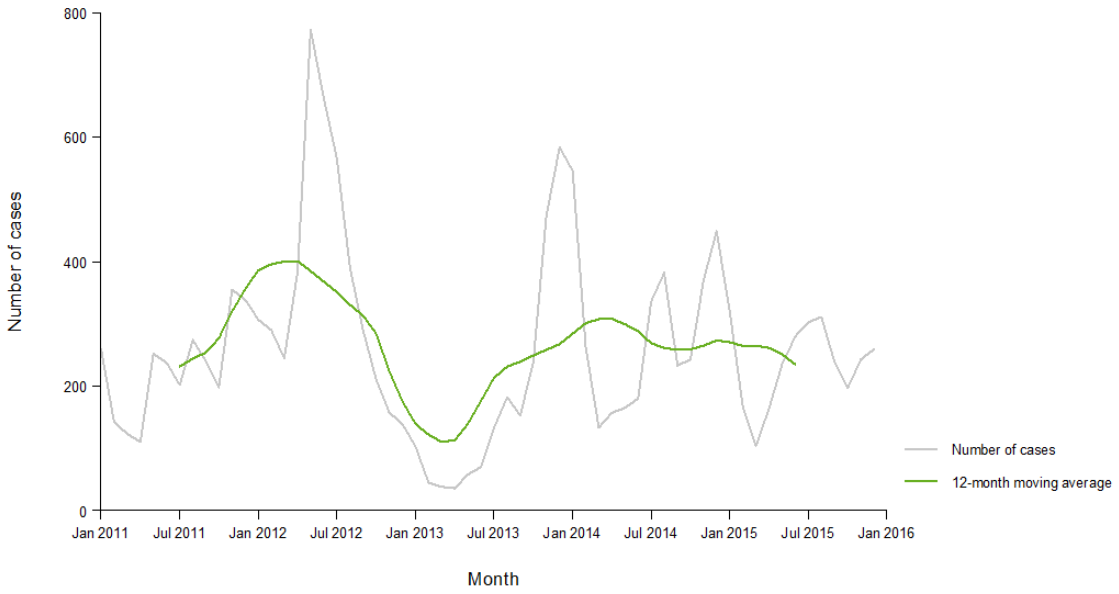
In 2015, 28 cases of hantavirus infection were identified as travel-related: 22 were reported in Germany; three in Austria; and one each in France, Hungary and the Netherlands. Out of the 28 travel-related cases, 13 were imported from another EU country. For most of the cases (n=1 885, 65.3%) importation status was unknown.

Among 906 documented cases, four fatalities were notified in EU countries in 2015: one case in Romania, one case in Austria and two cases in Germany (one imported case from Georgia). In 2014, three deaths among 804 documented cases were recorded: two cases in Poland and one case in Germany.

Trend

No obvious trend can be detected in Figure 4. Every other year (2012 and 2014), a peak can be noticed. The peak in mid-2012 is mainly attributable to an outbreak in Germany [4] while the peak at the end of 2013 and at the beginning of 2014 can be attributed to the outbreak in Finland.

Figure 4. Distribution of reported hantavirus infection cases by month, EU/EEA, 2011–2015



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

Discussion

Two main hantaviruses cause clinical infections in Europe: Puumala virus, which is widely distributed in Europe and transmitted by bank voles, and Dobrava virus, which is present in the Balkans and central and eastern Europe and transmitted by striped field mice and yellow-necked mice [5].

Fluctuations in hantavirus epidemiology appear to be driven by changing landscape attributes and climatic parameters which lead to increased food availability for rodents and prolonged virus survival [4,6]. There is no apparent long-term trend in the surveillance data for hantavirus cases in Europe. Temporal changes in seasonality noticed in different regions in Europe are not reflected in the overall seasonality due to the predominance of cases reported by Finland.

If known determinants of the epidemiology of hantavirus, such as temperature and forest cover, remain at their current levels, models predict that the incidence of haemorrhagic fever with renal syndrome (e.g. caused by hantaviruses such as Puumala and Dobrava) may increase in places where the disease is already present, but will not spread further [4]. However, some extension of the geographic distribution of cases was reported in France in 2014 [6]. As predicted, environmental conditions in Germany were suitable for an increase of risk of Puumala virus infection in 2015 compared with 2014 [7].

Another aetiological agent responsible for haemorrhagic fever with renal syndrome is Seoul hantavirus, which is carried by brown rats (*Rattus norvegicus*). Only a few human cases of Seoul hantavirus infection have been reported, mostly in Asia and more recently in France and the UK [8,9]. Pet rats can also be a source of human infection [8]. A hantavirus case caused by Tula virus which is carried by the common vole (*Microtus arvalis*) was identified in France in 2015 [10].

Public health implications

Avoidance of virus-contaminated dust during work or leisure time is essential. Airborne dust should be avoided when areas containing rodent droppings are cleaned, and moist cleaning with disinfectants is recommended. For people with underlying disease, face masks should be used.

Wild rodents taken into homes as pets or to laboratories for research purposes have caused infections.

Since Puumala virus remains infective outside the host for an unusually long period (up to two weeks at room temperature), the risk of infection can persist even after the rodents have been removed.

A report published by ECDC on hantavirus prevention measures and communication strategies regarding prevention and control of hantavirus infections includes the following options for strengthening disease prevention [11]:

- A common case definition at the European level
- Sharing information on prevention and communication strategies among countries
- Assessing the impact of prevention to support evidence-based preventive measures
- A better understanding of the risk factors, risk groups, and the effectiveness of preventive measures through multidisciplinary collaboration among experts
- Assessing the impact of communication strategies on relevant target groups with regard to disease awareness, knowledge, and preventive measures to improve communication.

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