

West Nile virus infection

Annual Epidemiological Report for 2018

Key facts

- For 2018, eleven EU/EEA Member States reported 1 605 West Nile virus (WNV) infections, of which 1 548 (96%) were locally acquired.
- The majority of locally acquired cases were reported by Italy, Greece and Romania, representing 39%, 20% and 18% of EU cases respectively.
- The EU notification rate for locally acquired cases was 0.4 cases per 100 000 population, eight times higher than the rate in 2017.
- For 2018, 166 deaths among locally acquired West Nile virus infections were reported, with Greece (n=51), Italy (n=49) and Romania (n=43) accounting for 86% (n=143) of them.
- In 2018, the first case was reported at the end of May and the last case was reported in December.

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].

This report is based on data collected through two complementary processes:

- real-time reporting during the period of high mosquito activity (June–December); and
- the annual data collection. Countries that did not detect any cases during the year are asked to report 'zero cases'. All other countries are encouraged to report complementary data on detected cases, if considered relevant.

For 2018, 28 EU/EEA countries reported data (Denmark, Germany and Liechtenstein did not report). All data were case-based. Twenty-five countries used the EU case definition, while France and the United Kingdom used an alternative case definition and Finland did not specify the case definition it used. Reporting was compulsory in 26 countries and voluntary in France and the United Kingdom. Surveillance was comprehensive in all reporting countries and mostly passive.

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Epidemiology

For 2018, eleven EU/EEA Member States reported 1 605 WNV infections, 1 548 (96%) of which were locally acquired (Table 1). Eighty-five per cent (n=1 311) of the locally acquired cases were confirmed.

Most locally acquired cases were reported by Italy, Greece and Romania, representing 39%, 20% and 18% of EU cases, respectively (Table 1, Figure 1). Compared with 2017, a 12-fold increase in cases was reported in Italy, a 7-fold increase in Greece and a 4-fold increase in Romania. All countries with WNV infections in 2018 reported their highest number of cases since 2014. The Czech Republic and Slovakia reported locally acquired cases for the first time since 2013. The EU notification rate for locally acquired cases was 0.4 cases per 100 000 population, eight times higher than in 2017 (0.05).

For 2018, 166 deaths among locally acquired WNV infections were reported by Greece (n=51), Italy (n=49), Romania (n=43), Hungary (n=15), Croatia (n=4), Bulgaria (n=3) and the Czech Republic (n=1). The case fatality among infections with known outcome was 11%. All affected Member States except for Italy provided data on hospitalisation status. Of the 929 WNV infections with reported hospitalisation status, 89% (n=826) were hospitalised. For 2018, 992 neuroinvasive cases, 468 non-neuroinvasive cases and 83 infections among blood donors were reported, with a proportion of neuroinvasive infections among symptomatic WNV infections of 68%. Infections among blood donors were reported by Italy (n=68), Greece (n=6), Austria (n=5), Croatia (n=2) and France (n=2).

For 2018, 57 travel-related cases were reported. Nineteen cases were associated with travel within the EU, while 24 cases were reported to have travelled outside the EU. For 14 cases, the place of infection was reported as unknown.

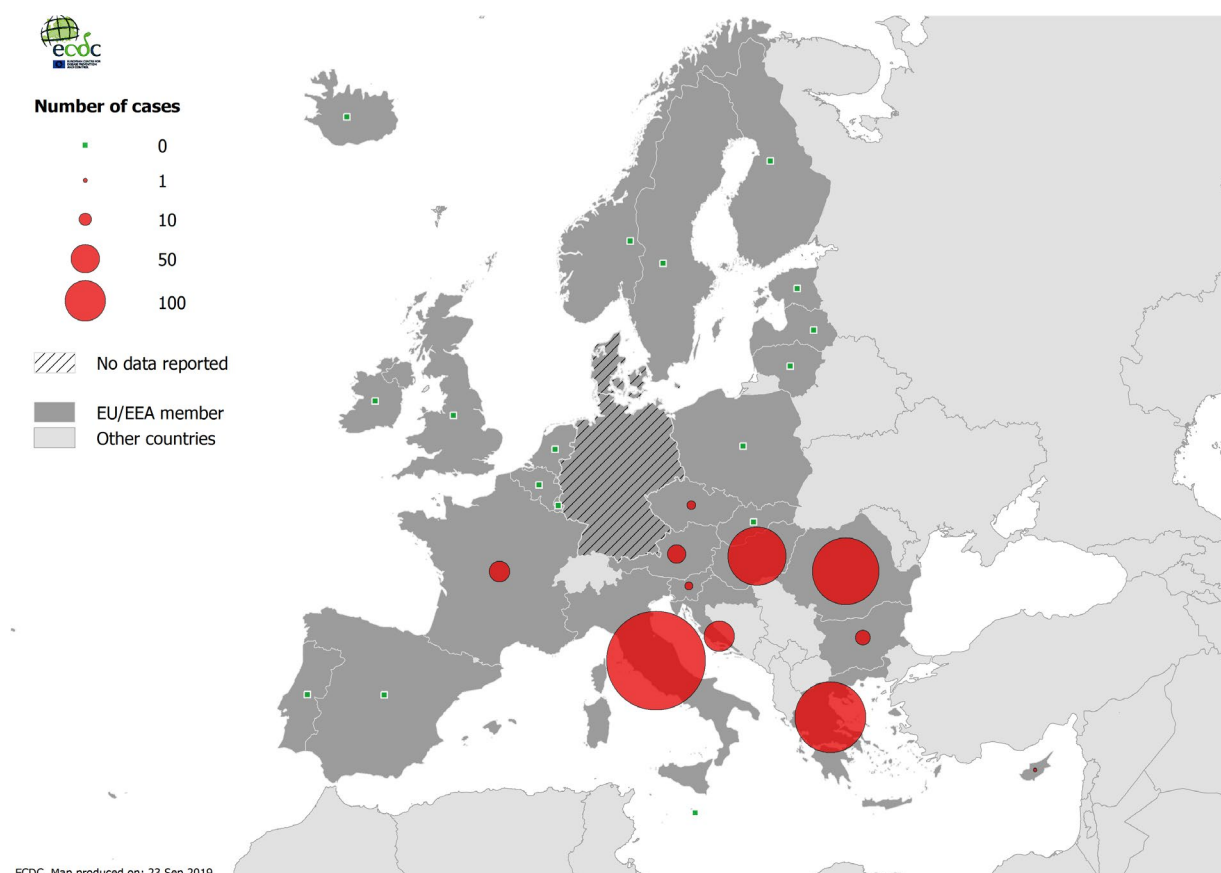
Table 1. Distribution of locally acquired West Nile virus infection cases and rates per 100 000 population by country and year, EU/EEA, 2014–2018

Country	2014		2015		2016		2017		2018			
	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	ASR	Confirmed cases
Austria	2	0.0	6	0.1	5	0.1	6	0.1	21	0.3	0.3	20
Belgium	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Bulgaria	0	0.0	2	0.0	2	0.0	1	0.0	15	0.2	0.2	7
Croatia	1	0.0	1	0.0	2	0.0	5	0.1	58	1.5	1.4	58
Cyprus	0	0.0	0	0.0	1	0.1	0	0.0	1	0.1	0.1	1
Czech Republic	0	0.0	0	0.0	0	0.0	0	0.0	5	0.1	0.1	5
Denmark	.	.	.	.	.	.	.	.	.	.	.	.
Estonia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Finland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
France	0	0.0	1	0.0	0	0.0	2	0.0	27	0.0	0.0	12
Germany	.	.	.	.	.	.	.	.	.	.	.	.
Greece	15	0.1	0	0.0	0	0.0	48	0.4	315	2.9	2.5	195
Hungary	10	0.1	18	0.2	44	0.5	20	0.2	215	2.3	2.2	132
Iceland	.	.	.	.	.	.	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	0.0	0
Italy	24	0.0	61	0.1	76	0.1	53	0.1	610	1.0	0.9	610
Latvia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Malta	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Netherlands	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Norway	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Poland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Portugal	.	.	1	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Romania	23	0.1	32	0.2	93	0.5	66	0.3	277	1.4	1.3	267

Country	2014		2015		2016		2017		2018			
	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	ASR	Confirmed cases
Slovakia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Slovenia	0	0.0	0	0.0	0	0.0	0	0.0	4	0.2	0.2	4
Spain	0	0.0	0	0.0	3	0.0	0	0.0	0	0.0	0.0	0
Sweden	0	0.0	0	0.0	0	0.0	0	0.0	0	0.1	0.1	0
United Kingdom	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
EU/EEA	75	0.0	122	0.0	226	0.1	201	0.0	1548	0.4	0.3	1311

∴ no data reported. ASR: age-standardised rate

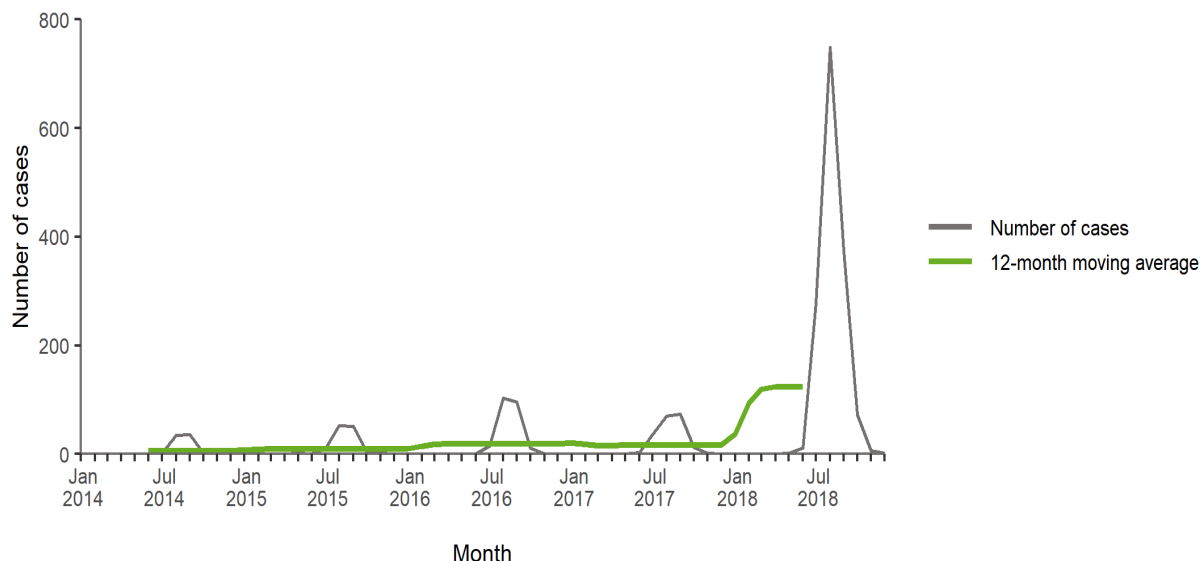
Figure 1. Distribution of West Nile virus infection cases by country, EU/EEA, 2018



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

During 2014–2018, a significant increasing trend ($p < 0.05$) in the number of locally acquired WNV infections was observed, probably affected by the high increase of WNV infections in 2018 (Figure 2). At country level, Austria, the Czech Republic, Greece, France, Hungary, Italy and Romania reported significantly ($p < 0.05$) increasing trends in the past five years (2014–2018).

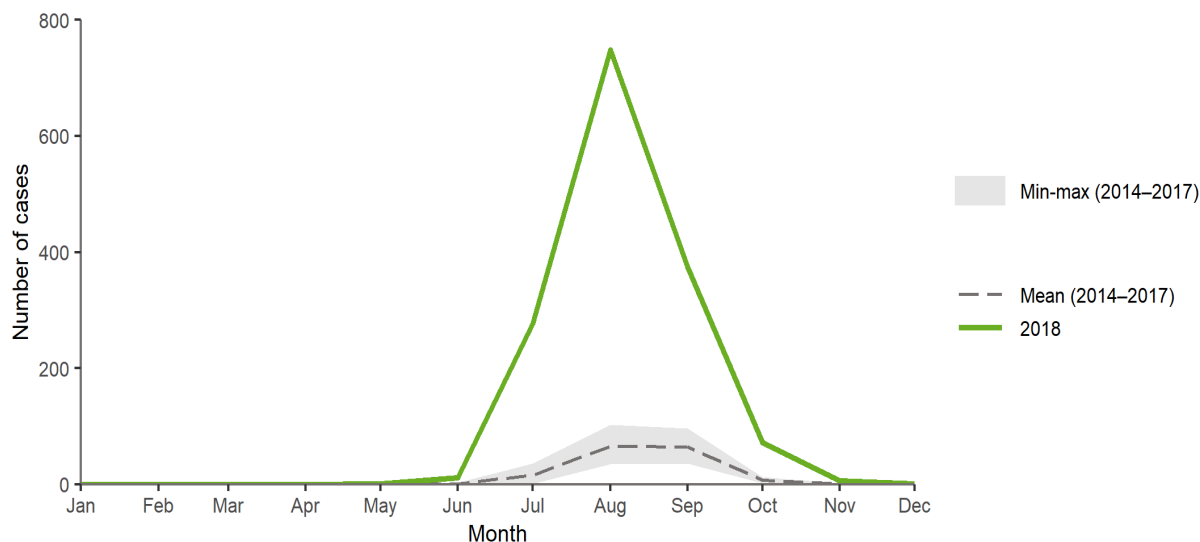
Figure 2. Distribution of West Nile virus infection cases by month, EU/EEA, 2014–2018



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

WNV infections show a strong seasonal pattern, with the first cases usually reported in June and most cases occurring from July–October. However, in 2018 the first case was reported at the end of May and the last case was reported from December. A steeper increase in locally acquired cases was observed in 2018 compared to previous years. The peak of infections in 2018 was recorded in August, which is consistent with previous years, but far above the mean observed during the 2014–2017 period (Figure 3).

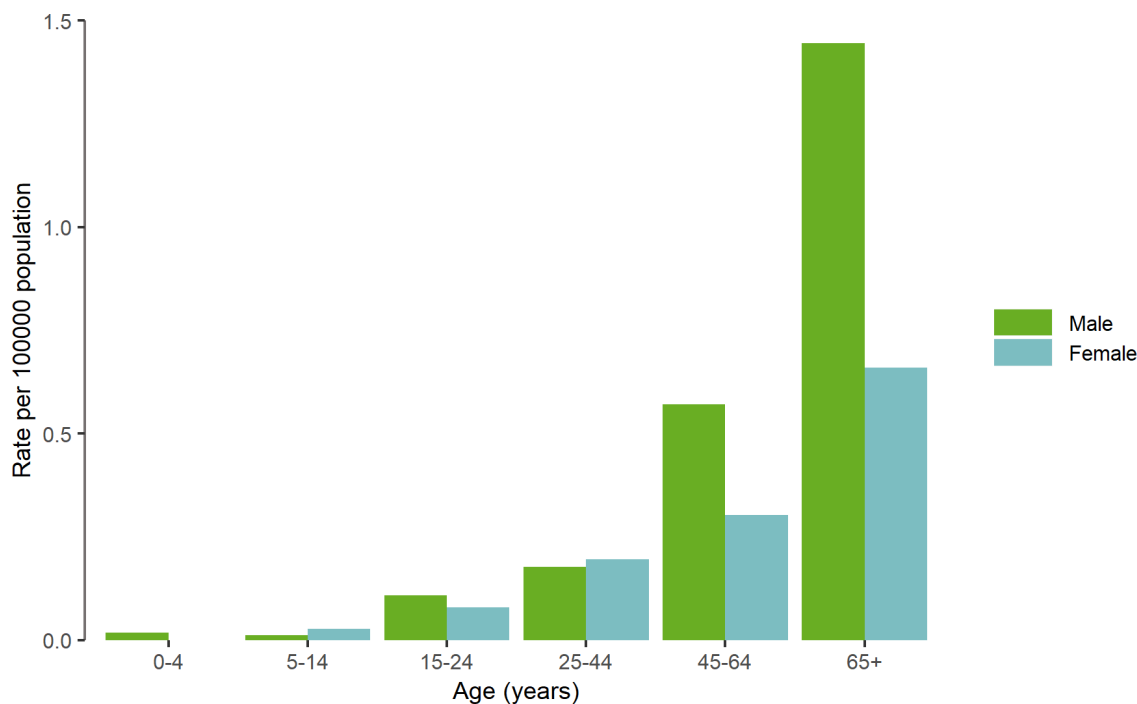
Figure 3. Distribution of West Nile virus infection cases by month, EU/EEA, 2018 and 2014–2017



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

In 2018, the overall rate of WNV infections was higher among men than women (0.05 cases and 0.03 cases per 100 000 population, respectively) and the overall male-to-female ratio was 1.6:1 (Figure 4). Notification rates in men and women increased with age, except for males in the age group 5–14 years. Notification rates in both men and women were highest in the group aged over 64 years (1.4 and 0.06 cases per 100 000 population, respectively).

Figure 4. Distribution of West Nile virus infection cases per 100 000 population, by age and gender, EU/EEA, 2018



Discussion

In 2018, a large number of human WNV infections were reported in the EU/EEA, far exceeding the annual totals for the previous four years. The notification rate for locally acquired WNV infections in the EU/EEA was almost eight times higher in 2018 compared with 2017. Almost all countries in 2018 reported their highest number of cases ever [4-7].

The peak of WNV infections, generally between July and October, coincides with the period when mosquito vectors are most active and the ambient temperature is sufficiently high for virus multiplication in the vectors in the EU/EEA. However, in 2018, the transmission season lasted longer than other years, and an early disease onset [8] as well as an unusually late date of onset was observed.

In 2018, the proportion of neuroinvasive infections among symptomatic WNV infections was 68%, which was lower than in 2017 (79%). The case fatality in 2018 was also slightly lower (11% compared to 12%).

Although all mosquito-borne autochthonous human cases during the 2018 transmission season were reported from previously affected countries, the virus spread to areas where no human autochthonous cases had previously been reported [7,9]. In 2018, for the first time, WNV infections were detected in resident wild and captive birds in Germany [10], demonstrating the spread of the virus across the EU.

Public health implications

No vaccine against WNV infection in humans is available. Personal protection from mosquito bites is advisable for individuals residing in or visiting affected areas, especially the elderly and immunocompromised who are at higher risk of developing severe symptoms. Personal protective measures to reduce the risk of mosquito bites include the use of mosquito repellent in accordance with instructions indicated on the product label and wearing long-sleeved shirts and trousers. In addition, screen windows and screen doors can keep mosquitoes out [11].

To prevent transfusion-transmitted WNV infections during the active virus transmission period, EU/EEA countries should implement 28-day blood donor deferral or nucleic acid testing of prospective donors who have visited or live in an affected area. Donors of organs, tissues and cells living in or returning from an affected area should be tested for WNV infection [11].

Mosquito vectors (predominantly *Culex spp.*) may be controlled through larval source reduction and measures against adult mosquitoes. Vector breeding sites include stagnant and often dirty water in dishes, buckets, barrels and cans, flowerpots, rain gutters, discarded tyres and other containers that can collect water. In urban

environments, infrastructure such as underground heating, sewage pipes and basements liable to flooding can act as breeding and resting sites for vectors. Specific methods for vector control to prevent transmission of WNV have seldom been evaluated for their impact on reducing human cases [12].

In addition to surveillance of human infections, WNV surveillance in other vertebrate hosts, such as equids and birds, and in vectors may support the early detection of virus circulation [13,14].

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