



## SURVEILLANCE REPORT

# Annual Epidemiological Report for 2016 West Nile virus infection

### Key facts

- For 2016, seven EU/EEA Member States reported 238 West Nile virus (WNV) infections, of which 224 (94%) were locally acquired and 14 were travel-related.
- Most locally acquired cases were reported by Romania and Italy, representing 42% and 34% of EU cases respectively.
- The EU notification rate for locally acquired cases was 0.1 cases per 100 000 population, which is comparable with the rates in 2012 and 2013, before the sharp decrease in 2014.
- For 2016, 27 deaths linked to locally acquired West Nile virus infections were reported by Romania, Hungary and Italy.
- The first human WNV infection ever detected in Cyprus was notified in August 2016.

### Methods

This report is based on data for 2016 retrieved from The European Surveillance System (TESSy) on 10 December 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, 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–November); and
- 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 2016, 27 EU/EEA countries reported data (Denmark, Germany, Iceland and Liechtenstein did not report). All data were case-based except for data from Croatia. Twenty-three countries used the EU case definition, two countries used an alternative case definition (France and the United Kingdom) and two countries did not specify the case definition they used (Belgium and Finland). Reporting was compulsory in 25 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 2016, seven EU/EEA Member States reported 238 WNV infections, 224 (94%) of which were locally acquired (Table 1). Eighty-six per cent (n=192) of locally acquired cases were confirmed.

Most locally acquired cases were reported by Romania (n=93) and Italy (n=76), representing 42% and 34% of EU cases respectively (Table 1, Figure 1). Hungary, Italy and Romania reported an increase in the number of cases compared with 2015. The first human WNV infection ever detected in Cyprus was notified in August 2016.

The EU notification rate for locally acquired cases was 0.1 cases per 100 000 population, which is comparable with the rates in 2012 and 2013, before the sharp decrease in 2014.

For 2016, 27 deaths linked to locally acquired West Nile virus infections were reported by Romania (n=19), Hungary (n=6) and Italy (n=2). The case fatality among infections with known outcome was 12%. All affected Member States except for Italy provided data on the hospitalisation status. Of the 148 WNV infections with reported hospitalisation status, 94% (n=139) were hospitalised. For 2016, 170 neuroinvasive cases, 29 non-neuroinvasive cases and 23 infections among blood donors were reported, with a proportion of neuroinvasive infections among symptomatic WNV infections of 85%. Infections among blood donors were reported by Italy (n=22) and Austria (n=1).

For 2016, 14 travel-related cases, one of which was fatal, were reported. One case each had travelled to Canada, Egypt, Romania, Spain and Tunisia and nine cases were reported with unknown place of infection.

**Table 1. Distribution of locally acquired West Nile virus infections by country and year, EU/EEA, 2012–2016**

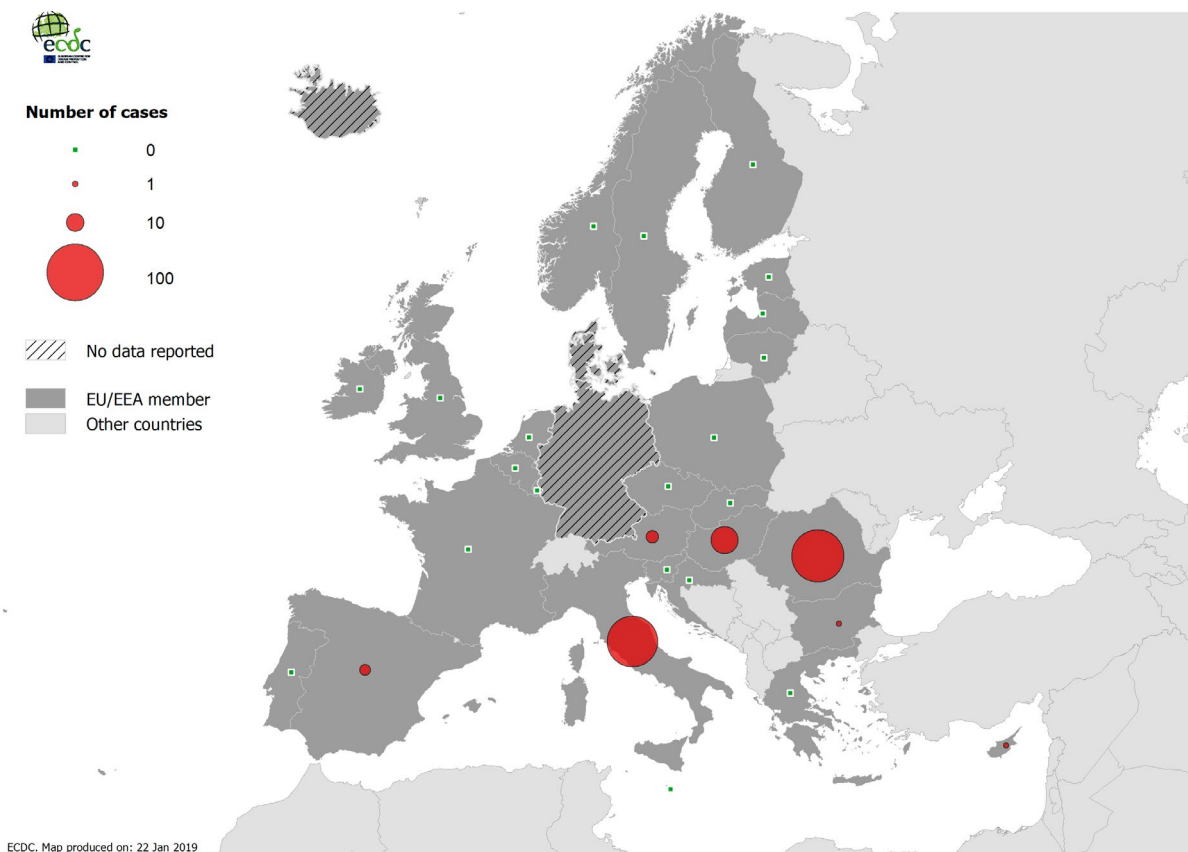
Country	2012		2013		2014		2015		2016			
	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	Reported cases	Rate	ASR	Confirmed cases
Austria	0	0.0	0	0.0	2	0.0	6	0.1	5	0.1	0.1	5
Belgium	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Bulgaria	2	0.0	0	0.0	0	0.0	2	0.0	2	0.0	0.0	1
Croatia	0	0.0	0	0.0	-	-	0	0.0	0	0.0	0.0	0
Cyprus	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	0.1	1
Czech Republic	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0.0	0
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	0	0.0	0	0.0	1	0.0	0	0.0	0.0	0
Germany	.	.	.	.	.	.	.	.	.	.	.	.
Greece	160	1.4	86	0.8	15	0.1	0	0.0	0	0.0	0.0	0
Hungary	17	0.2	35	0.4	10	0.1	18	0.2	44	0.4	0.4	21
Iceland	.	.	.	.	.	.	.	.	.	.	.	.
Ireland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Italy	73	0.1	126	0.2	24	0.0	61	0.1	76	0.1	0.1	76
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
Romania	15	0.1	24	0.1	23	0.1	32	0.2	93	0.5	0.5	85
Slovakia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Slovenia	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Spain	0	0.0	0	0.0	0	0.0	0	0.0	3	0.0	0.0	3
Sweden	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
United Kingdom	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
EU/EEA	267	0.1	273	0.1	74	0.0	121	0.0	224	0.1	0.0	192

ASR: age-standardised rate

:: no data reported

-.: no rate calculated.

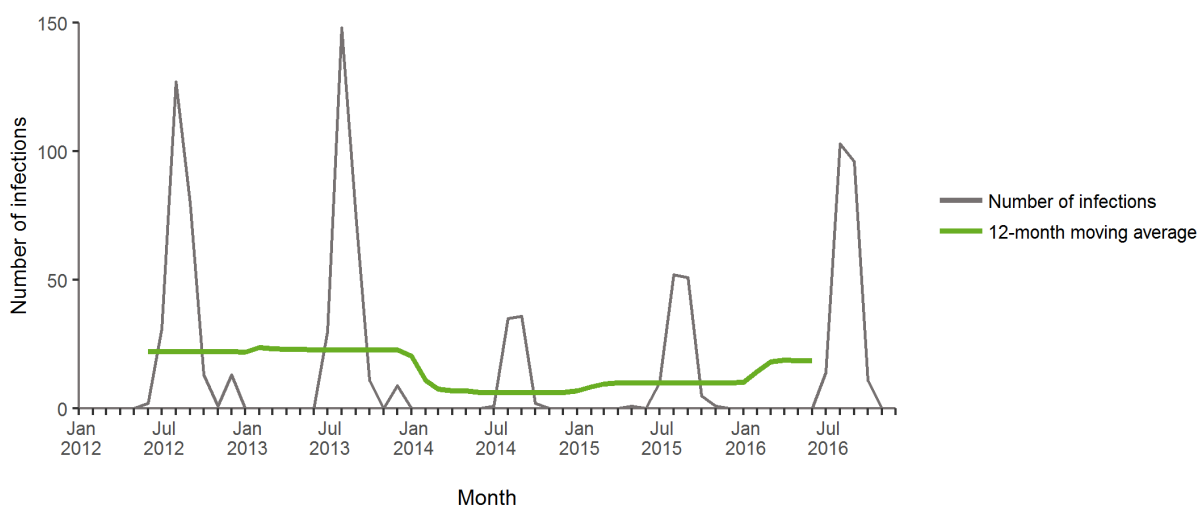
**Figure 1. Distribution of locally acquired West Nile virus infections by country, EU/EEA, 2016**



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

From 2012–2016, no significant trend in the number of reported locally acquired WNV infections was observed. However, three peaks occurred in 2012, 2013 and 2016.

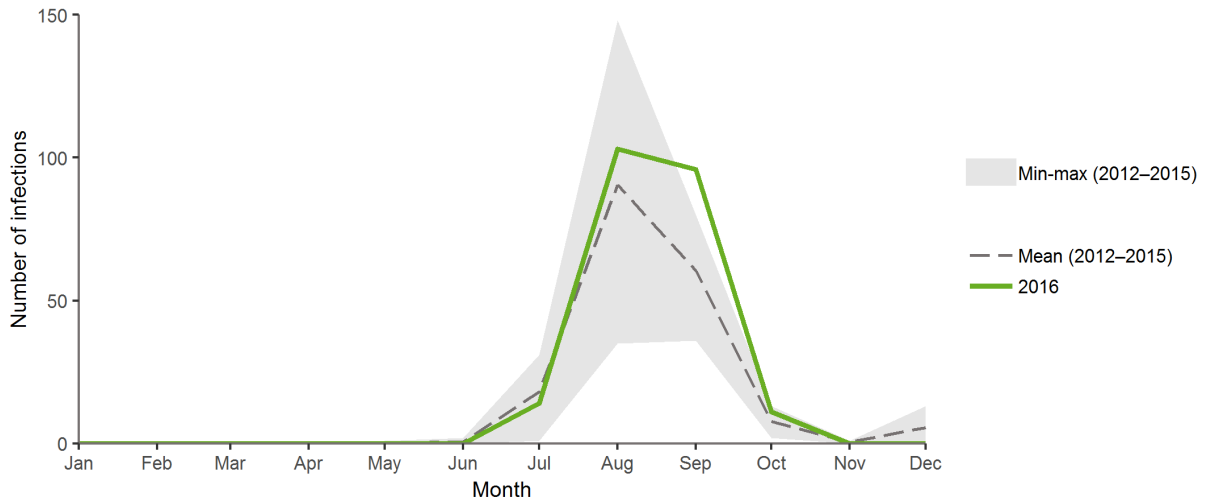
**Figure 2. Distribution of locally acquired West Nile virus infections by month, EU/EEA, 2012–2016**



Source: Country reports from Austria, 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.

West Nile virus infections show a strong seasonal pattern, with the first cases usually reported in June and most cases occurring from July–October. This peak season coincides with the period when mosquito vectors are most active in the EU/EEA. The 2016 peak of infections was recorded in August, which is consistent with previous years, although above the mean observed during the 2012–2015 period (Figure 3).

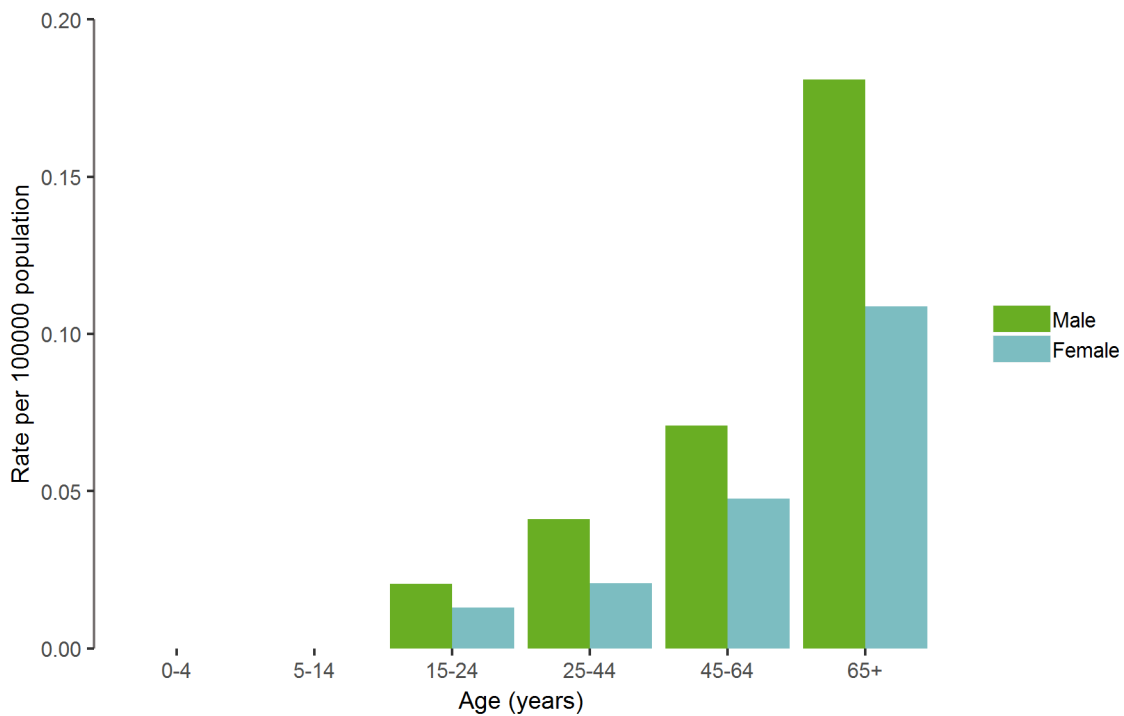
**Figure 3. Distribution of locally acquired West Nile virus infections by month, EU/EEA, 2012–2015 and 2016**



Source: Country reports from Austria, 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 2016, the overall rate of WNV infections was higher among men than women in all age groups (0.06 and 0.04 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 and were highest in the age group over 64 years (0.18 and 0.11 cases per 100 000 population respectively).

**Figure 4. Distribution of locally acquired West Nile virus infections by age, EU/EEA, 2016**



## Discussion

The notification rate of WNV infections in the EU/EEA increased compared with 2015 and was similar to 2012 and 2013. Notification rates from Romania and Hungary increased considerably compared with the previous year.

France and Portugal did not report any locally acquired WNV infections for 2016 after having reported one infection each for 2015. After a large outbreak in 2010 followed by a decrease in 2013 and 2014, Greece did not report any human infections in 2015 and 2016. However, continued virus circulation was detected in mosquitoes and birds [4,5]. Cyprus reported its first human WNV infection in 2016. However, it is uncertain whether this infection was locally acquired since the patient had a history of travel to Greece within 16 days of symptom onset [6]. The incubation period is usually two to six days, but incubation periods of up to 21 days have been reported in immunocompromised persons [7]. As no human WNV infections were identified in Greece in 2016, the status of this case remains unclear. For 2016, Spain reported the first WNV infections since 2010, when two cases were reported. The index case in 2016 was a French tourist visiting Andalusia and the other two cases were diagnosed in Andalusia [8].

In 2016, the proportion of neuroinvasive infections among symptomatic WNV infections was 85% and therefore comparable to the proportion in 2015 (83%).

In 2016, the case fatality (12%) was higher than in the previous four years (range: 1.79.5%), mainly due to the high case fatality in Romania (20%) [9] and Hungary (14%).

## Public health implications

No vaccine against WNV infection in humans is available. Personal protection from mosquito bites is advisable for any person residing in or visiting affected areas, especially the elderly and immunocompromised people 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 long trousers. In addition, window and door screens can keep mosquitoes out.

To prevent transfusion-transmitted WNV infections, 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.

Mosquito vectors may be controlled through larval source reduction and measures against adult mosquitoes. Vector breeding sites include stagnant and often dirty water collections in dishes, buckets, barrels and cans, flowerpots, rain gutters, discarded tires 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 [10].

In addition to surveillance of human infections, WNV surveillance in animals such as equids and birds and vectors may support the early detection of virus circulation [11].

## References

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