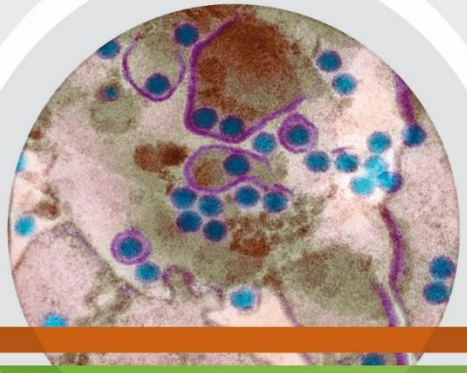


SURVEILLANCE REPORT

Annual Epidemiological Report for 2016

Dengue

Key facts

- In 2016, 25 countries reported 2 821 travel-associated cases of dengue fever, of which 2 418 (85.7%) were confirmed.
- The EU/EEA notification rate in 2016 was 0.6 cases per 100 000 population.
- The number of cases was the highest observed during the 2012 to 2016 period.
- The highest rates were in men and women 25–44 years of age.
- The number of cases increased during the winter, Easter and summer holidays, reflecting travel patterns of EU/EEA populations.
- A total of 20.5% of the cases were imported from Thailand.

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].

Twenty-seven EU/EEA countries reported data on dengue fever. Two of these countries reported no cases (Czech Republic and Iceland). No data were reported by Bulgaria, Cyprus, Denmark and Liechtenstein.

Reported data for dengue were heterogeneous as no specific case definition was available in 2016. Eighteen countries referred to the EU's generic case definition for viral haemorrhagic fevers, three countries did not specify which case definition was used (Belgium, Finland and France) and six countries used other case definitions (the Czech Republic, Germany, the Netherlands, Poland, Portugal and the United Kingdom).

All reporting countries except the Netherlands have a comprehensive surveillance system. Reporting is compulsory in all countries except the United Kingdom, where it is voluntary.

Suggested citation: European Centre for Disease Prevention and Control. Dengue. In: ECDC. Annual epidemiological report for 2016. Stockholm: ECDC; 2018.

Stockholm, September 2018

Epidemiology

In 2016, 25 countries reported 2 821 cases of dengue fever, of which 2 418 (85.7%) were confirmed (Table 1). The number of cases has been fluctuating over the years, with the highest number of cases reported in 2016.

The EU/EEA notification rate in 2016 was 0.6 cases per 100 000 population, higher than in 2014 and 2015, when it was at 0.4 and 0.5 cases per 100 000 population respectively.

Germany reported the highest number of cases (n=956; 33.9%), followed by the United Kingdom (468; 16.6%), France (297; 10.5%), Spain (261; 9.3%) and Sweden (225; 8%) (Table 1, Figure 1).

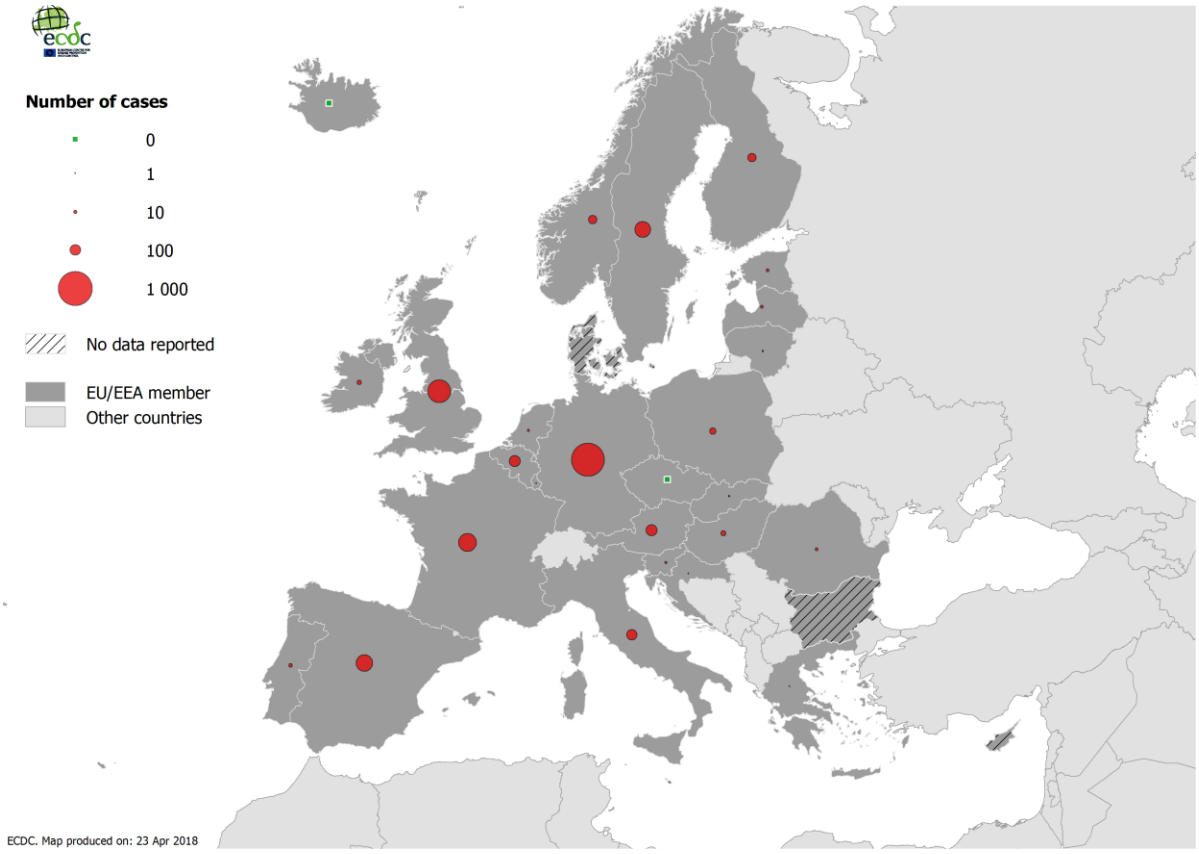
All cases were travel-related.

Table 1. Distribution of dengue 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	ASR	Confirmed cases
Austria	2	0.0	89	1.1	91	1.1	103	1.2	116	1.3	1.4	116
Belgium	73	0.7	139	1.2	110	1.0	108	1.0	114	1.0	1.1	114
Bulgaria	.	.	.	.	.	.	.	.	.	.	.	.
Croatia	1	0.0	3	0.1	2	0.0	.	.	2	0.0	-	2
Cyprus	.	.	.	.	.		.	.	.	.	.	.
Czech Republic	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Denmark	.	.	.	.		.	.	.	.	.	.	.
Estonia	0	0.0	0	0.0	9	0.7	12	0.9	9	0.7	0.7	9
Finland	90	1.7	80	1.5	38	0.7	54	1.0	66	1.2	1.3	66
France	110	0.2	271	0.4	212	0.3	167	0.3	297	0.4	0.5	159
Germany	616	0.8	877	1.1	626	0.8	722	0.9	956	1.2	1.3	956
Greece	0	0.0	1	0.0	4	0.0	2	0.0	2	0.0	0.0	2
Hungary	3	0.0	10	0.1	6	0.1	12	0.1	24	0.2	0.2	19
Iceland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0	0
Ireland	7	0.2	15	0.3	21	0.5	8	0.2	18	0.4	0.4	18
Italy	74	0.1	142	0.2	79	0.1	103	0.2	106	0.2	0.2	106
Latvia	7	0.3	7	0.3	1	0.0	4	0.2	9	0.5	0.5	9
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	0	0.0	1	0.0	3	0.1	9	0.3	4	0.1	0.1	0
Luxembourg	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	0.2	1
Malta	0	0.0	0	0.0	0	0.0	1	0.2	1	0.2	0.2	1
Netherlands	.	.	.	.	3	-	18	-	6	-	-	3
Norway	30	0.6	57	1.1	73	1.4	98	1.9	64	1.2	1.3	64
Poland	5	0.0	13	0.0	15	0.0	12	0.0	41	0.1	0.1	14
Portugal	.	.	.	.	.	.	14	0.1	13	0.1	0.1	9
Romania	3	0.0	6	0.0	6	0.0	7	0.0	8	0.0	0.0	7
Slovakia	3	0.1	4	0.1	0	0.0	2	0.0	4	0.1	0.1	4
Slovenia	10	0.5	8	0.4	2	0.1	3	0.1	6	0.3	0.3	6
Spain	0	0.0	0	0.0	0	0.0	168	0.4	261	0.6	0.5	199
Sweden	175	1.8	220	2.3	119	1.2	159	1.6	225	2.3	2.5	225
United Kingdom	0	0.0	571	0.9	376	0.6	423	0.7	468	0.7	0.8	309
EU/EEA	**1 209**	**0.3**	**2 514**	**0.5**	**1 796**	**0.4**	**2 209**	**0.5**	**2 821**	**0.6**	**0.6**	**2 418**

Source: Country reports.
.: No data reported
-: No rate calculated.

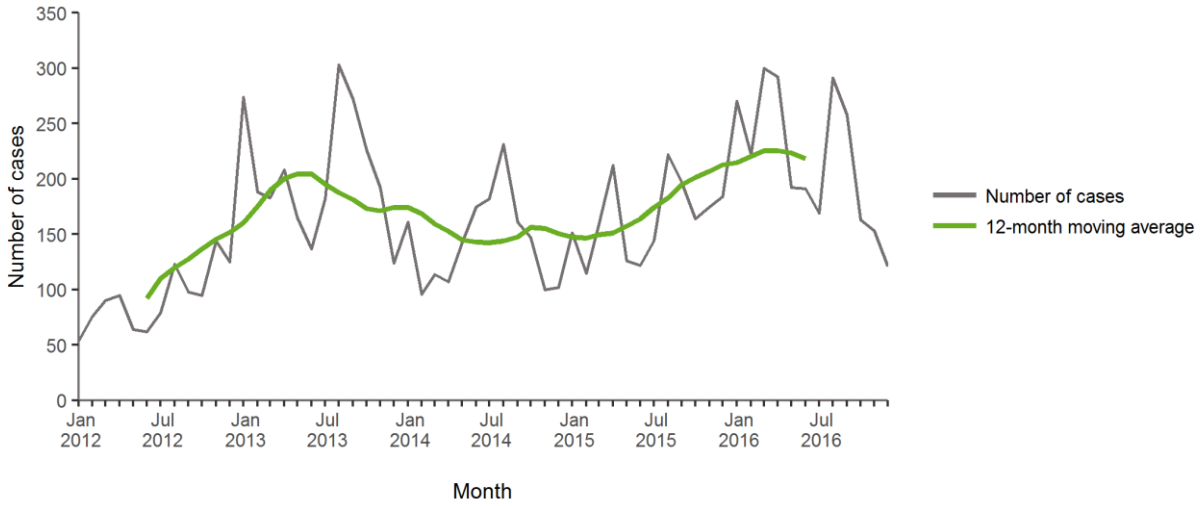
Figure 1. Distribution of dengue cases by country, EU/EEA, 2016



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

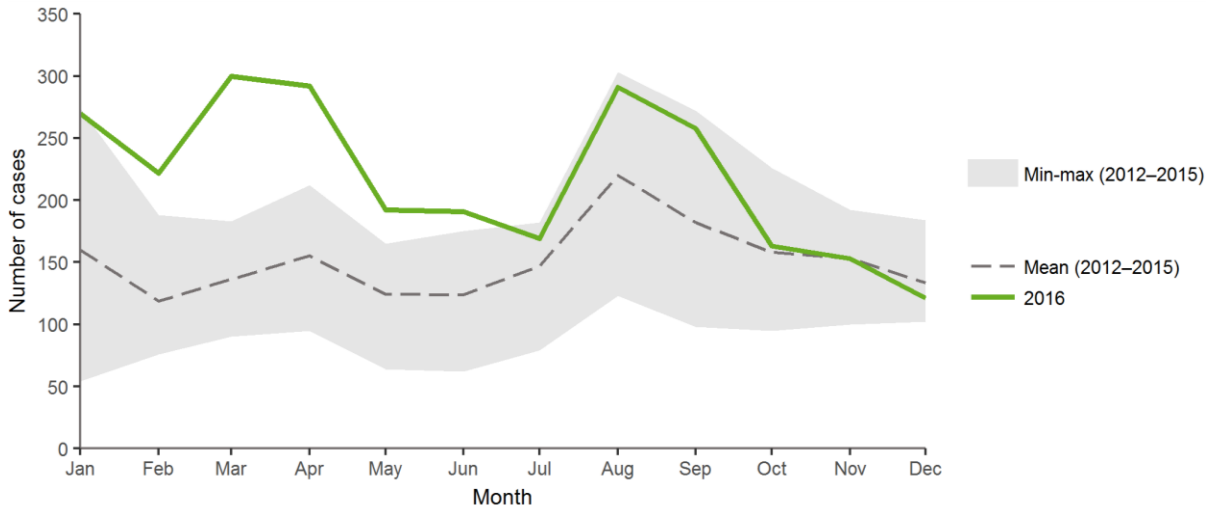
The numbers of dengue cases fluctuated during the year, with three peaks in January (289 reported cases), March to April (305 reported cases/month) and August to September (279 reported cases/month). These three peaks relate to the winter, Easter and summer holiday periods. The seasonal pattern of reported cases is very similar to what was observed in the years 2012 to 2015 (Figures 2 and 3).

Figure 2. Distribution of dengue cases by month, EU/EEA, 2012 to 2016



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

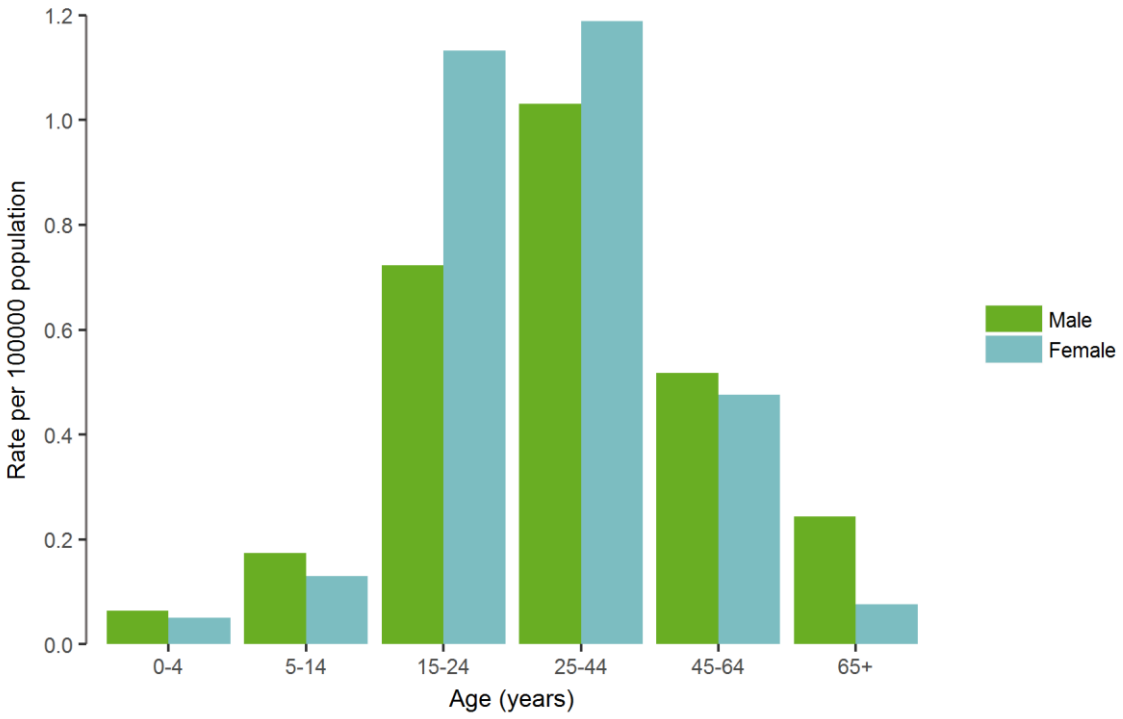
Figure 3. Distribution of dengue cases by month, EU/EEA, 2016 and 2012 to 2015



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

In 2016, the male-to-female ratio was 0.9:1. The majority of the cases were 25–44 years of age (n=1 434, 50.8%). The highest rates were observed in the age groups 15–24 and 25–44 years with 0.9 and 1.1 cases per 100 000 population respectively (Figure 4).

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



In 2016, most of the 1 504 cases for which the probable place of infection was known were infected in Thailand (n=309, 20.5%), Indonesia (n=274, 18.2%) and India (n=174, 11.6%).

Outbreaks and other threats

As in previous years, Asia and the Americas were the regions most affected by dengue around the world [4].

In Asia, the most affected countries were the Philippines, India, Malaysia and Vietnam with about 200 000 cases in the Philippines and between 100 000 and 110 000 cases in India, Malaysia and Vietnam [5]. The number of dengue cases in Thailand drastically decreased in 2016 compared with 2015, with less than half of the cases reported.

In the Americas, the number of cases decreased in 2016 compared with 2015, but was higher than in 2014. More than 2.1 million cases were reported in the Americas in 2016. Brazil reported the highest number of cases, with more than 1.5 million cases, followed by Mexico and Colombia, with 130 000 and 104 000 cases respectively [6].

There were no outbreaks of dengue in the continental EU/EEA in 2016.

Discussion

Travel-related cases of dengue fever in the EU/EEA reflect the evolution of the dengue situation in tropical regions where the disease is endemic. The number of travel-related cases reported in 2016 was higher than the yearly number of cases reported between 2012 and 2015, which probably relates to a higher transmission of the virus in countries visited by EU/EEA travellers.

The age and gender distribution of the dengue cases most likely reflects EU/EEA population travel patterns rather than other risk factors. Similarly, seasonality in case occurrence reflects holiday seasons.

For the first time since 2013, no autochthonous dengue transmission was reported in the continental EU/EEA. In 2013, 2014 and 2015, France reported autochthonous dengue cases following one or multiple introductions of the virus [7-9]. These recurrent events highlight the risk of local transmission of dengue virus in areas where competent mosquito vectors are established. In the continental EU/EEA, *Aedes albopictus* is established in the southern part of the EU (more information about vector distribution available from: https://ecdc.europa.eu/en/disease-vectors/surveillance-and-disease-data/mosquito-maps) and between mid-spring and mid-autumn, environmental conditions are generally considered favourable for vector activity and therefore autochthonous transmission of dengue virus [10]. *Aedes aegypti*, the primary vector for dengue virus transmission, is not present in the continental EU/EEA, but the species is established around the Black Sea and in several Outermost Regions of the EU such as Madeira and several islands in the Caribbean (e.g. Martinique and Guadeloupe).

Public health implications

Vigilance regarding imported cases of dengue and other diseases transmitted by *Aedes* mosquitoes remains essential. Public health authorities should raise awareness about the risk related to dengue among clinicians and travel clinic specialists in the EU/EEA, especially in areas where competent mosquito vectors are present and environmental conditions are suitable for transmission [10].

Preparedness plans to contain and/or mitigate the spread of dengue in the EU/EEA should address the following aspects:

- strengthening of surveillance systems, including the adoption of a specific case definition and the rapid detection and notification of cases at local, national and international levels
- regular reviews of contingency plans for mosquito-borne outbreaks
- education and engagement of the general public in the control of mosquito breeding sites
- strengthening vector surveillance systems and rapid implementation of vector control measures around each case; and
- considering the adoption of blood safety measures in affected areas. Measures should be aligned with those for West Nile virus infection.

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