

SURVEILLANCE REPORT

Dengue

Annual Epidemiological Report for 2019

Key facts

- For 2019, 27 countries reported 4 363 cases of dengue, of which 4 020 (92%) were confirmed.
- The number of cases in 2019 was almost double that for 2018, reflecting the intense circulation of the virus on a global scale.
- The EU/EEA notification rate in 2019 was 0.9 cases per 100 000 population.
- The highest rates in both men and women were among those aged 25–44 years.
- The number of cases peaked in August and November.
- Sixty-four percent of the cases with known probable country of infection were imported from Asia, mostly from Thailand and India.
- Twelve autochthonous dengue cases were reported from the EU/EEA¹: by France (n=9), Spain (n=2) and Germany (n=1).
- Most autochthonous dengue cases were the result of the virus being transmitted by a mosquito vector. One case in Spain resulted from sexual transmission and the case in Germany was the result of laboratory transmission.

Introduction

Dengue is a mosquito-borne disease caused by viruses of the *Flaviviridae* family. The disease is widespread in tropical and subtropical regions. While most of the clinical cases present a febrile illness, severe forms have been reported, including haemorrhagic fever, shock and fatalities.

Methods

This report is based on data for 2019 retrieved from The European Surveillance System (TESSy) on 9 October 2020. 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 on ECDC's website [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. All countries reported case-based data, except for Belgium. Czechia and the Netherlands reported zero cases. No data were reported by Bulgaria, Cyprus, Denmark and Liechtenstein.

¹ For the purposes of this document, the EU/EEA excludes the Outermost Regions and the Overseas Countries and Territories.

Three countries (Malta, Poland and Romania) referred to the 2018 dengue case definition, 17 countries referred to the EU generic case definition for viral haemorrhagic fevers, two countries did not specify which case definition was used (Belgium and France), and five countries used other case definitions (Czechia, Germany, the Netherlands, Portugal and the United Kingdom).

All reporting countries except for the Netherlands had a comprehensive surveillance system. Reporting was compulsory in all countries, except for Belgium and the United Kingdom where it was voluntary.

Epidemiology

For 2019, 27 countries reported 4 363 cases of dengue, of which 4 020 (92%) were confirmed (Table 1). This was almost double the number for 2018. Germany reported the highest proportion of cases (27%), followed by France (21%) and the United Kingdom (19%) (Table 1, Figure 1).

The EU/EEA notification rate in 2019 was 0.9 cases per 100 000 population, which was higher than in previous years. Country-specific rates were highest in Belgium, Norway and Sweden.

During the 2015–2019 period, the number of reported cases ranged from 2 028 in 2017 to 4 363 in 2019, with no obvious trend discernible (Figure 2).

Table 1. Distribution of dengue cases and rates per 100 000 population by country and year, EU/EEA, 2015–2019

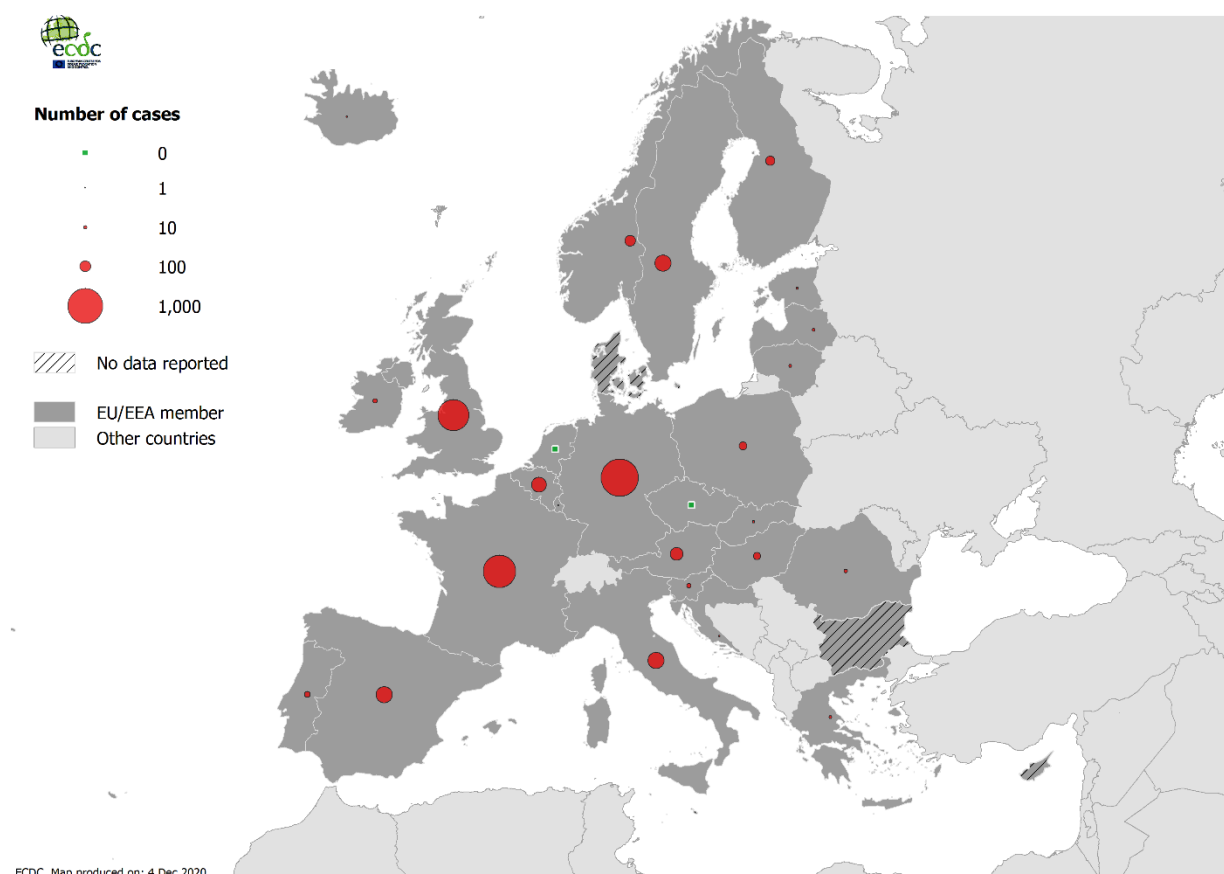
Country	2015		2016		2017		2018		2019		
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	ASR
Austria	103	1.2	116	1.3	85	1.0	85	1.0	142	1.6	1.7
Belgium	108	1.0	114	1.0	77	0.7	101	0.9	202	1.8	1.9
Bulgaria	.	.	.	.	.	.	.	.	.	.	.
Croatia	-	-	2	0.0	0	0.0	2	0.0	4	0.1	0.1
Cyprus	.	.	.	.	.	.	.	.	.	.	.
Czechia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Denmark	.	.	.	.	.	.	.	.	.	.	.
Estonia	12	0.9	9	0.7	8	0.6	6	0.5	6	0.5	0.5
Finland	54	1.0	66	1.2	25	0.5	56	1.0	81	1.5	1.6
France	285	0.4	373	0.6	266	0.4	331	0.5	904	1.3	1.4
Germany	722	0.9	958	1.2	635	0.8	614	0.7	1175	1.4	1.5
Greece	2	0.0	2	0.0	1	0.0	2	0.0	10	0.1	0.1
Hungary	12	0.1	24	0.2	17	0.2	14	0.1	44	0.5	0.5
Iceland	0	0.0	0	0.0	1	0.3	1	0.3	4	1.1	1.1
Ireland	8	0.2	18	0.4	10	0.2	17	0.4	18	0.4	0.4
Italy	103	0.2	106	0.2	95	0.2	108	0.2	231	0.4	0.4
Latvia	4	0.2	9	0.5	13	0.7	12	0.6	11	0.6	0.6
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.
Lithuania	9	0.3	4	0.1	4	0.1	8	0.3	9	0.3	0.4
Luxembourg	0	0.0	1	0.2	0	0.0	1	0.2	1	0.2	0.2
Malta	1	0.2	1	0.2	3	0.7	1	0.2	2	0.4	0.4
Netherlands	18	-	6	-	0	-	0	-	0	-	-
Norway	98	1.9	64	1.2	35	0.7	49	0.9	102	1.9	2.0
Poland	12	0.0	41	0.1	29	0.1	30	0.1	55	0.1	0.1
Portugal	14	0.1	13	0.1	11	0.1	14	0.1	30	0.3	0.3
Romania	7	0.0	8	0.0	7	0.0	4	0.0	15	0.1	0.1
Slovakia	2	0.0	4	0.1	2	0.0	7	0.1	6	0.1	0.1
Slovenia	3	0.1	6	0.3	5	0.2	8	0.4	21	1.0	1.1
Spain	168	0.4	261	0.6	128	0.3	205	0.4	228	0.5	0.5
Sweden	159	1.6	225	2.3	106	1.1	106	1.0	235	2.3	2.4
United Kingdom	423	0.7	468	0.7	465	0.7	432	0.7	827	1.2	1.3
EU-EEA	2327	0.5	2899	0.6	2028	0.4	2214	0.5	4363	0.9	0.9

Source: Country reports.

..: no data reported

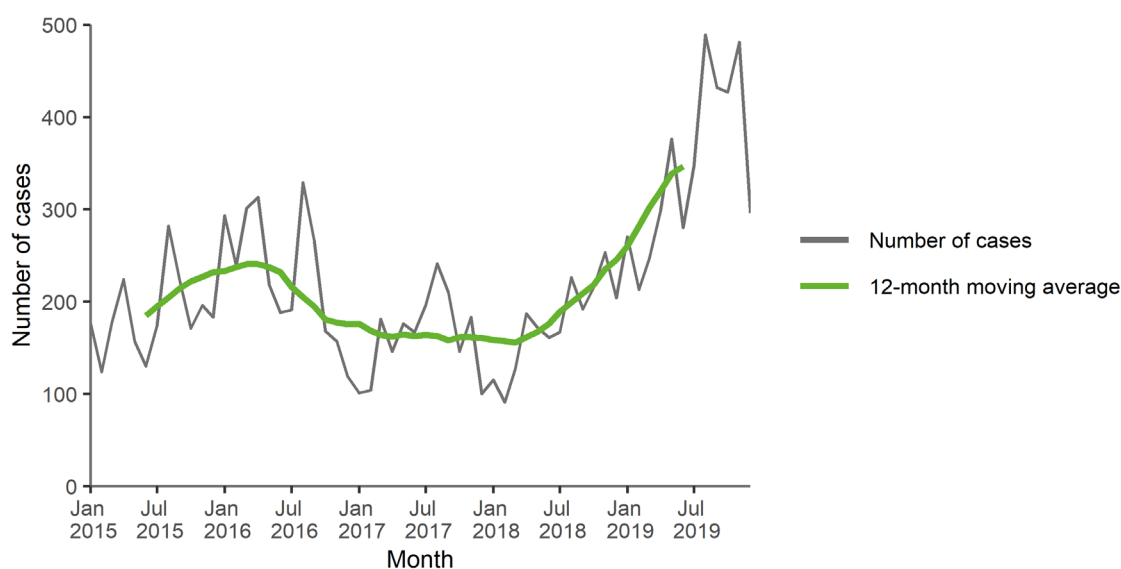
-.: no rate calculated.

ASR: age-standardised rate

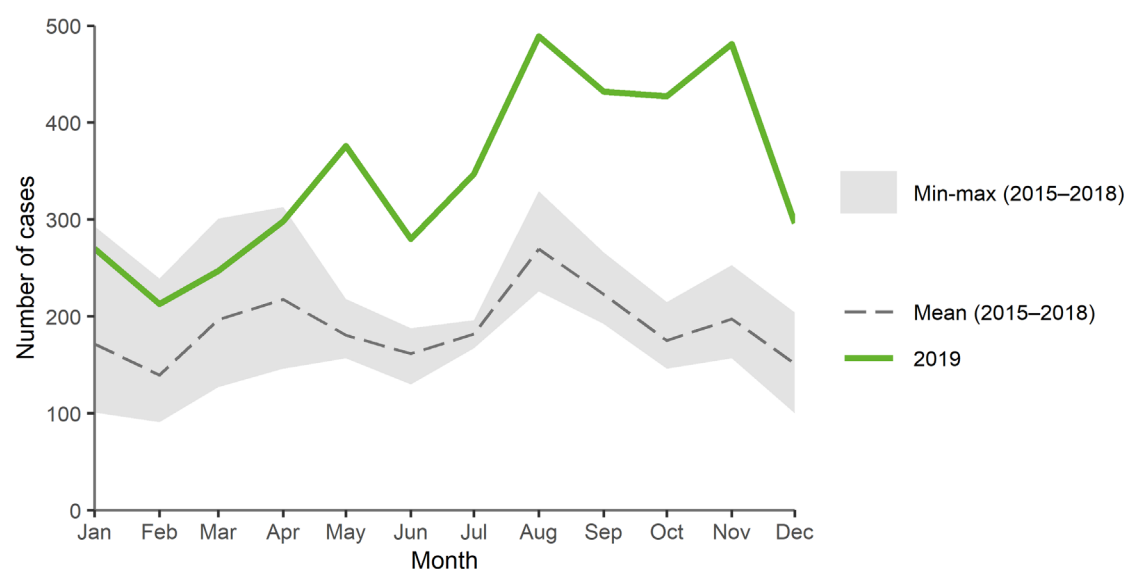
Figure 1. Distribution of dengue cases by country, EU/EEA, 2019

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

Information about the month of onset, diagnosis and/or reporting was available for 4 160 cases. A high number of these cases were observed between August and November ($n=1832$; 44%) with peaks in the number of cases in August ($n=489$) and November ($n=482$) (Figures 2, 3).

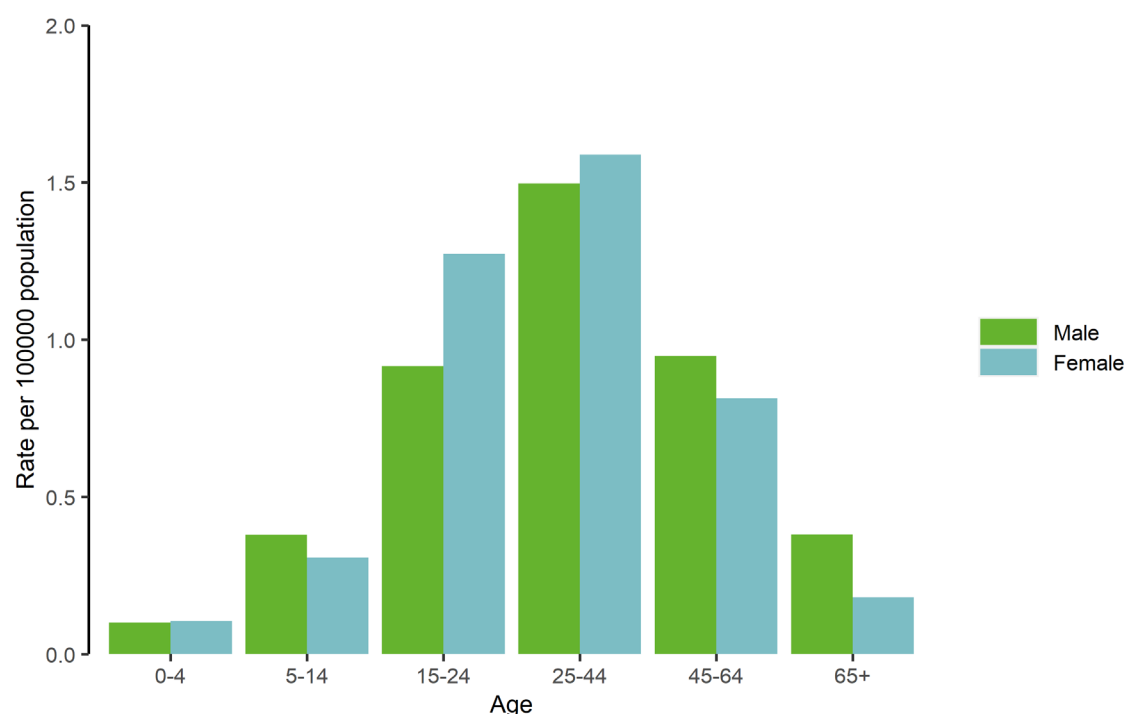
Figure 2. Distribution of dengue cases by month, EU/EEA, 2015–2019

Source: Country reports from Austria, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Figure 3. Distribution of dengue cases by month, EU/EEA, 2019 and 2015–2018

Source: Country reports from Austria, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Information on gender and age was available for 4 337 cases and 4 360 cases, respectively. The male-to-female ratio was 1:1. The majority of the cases ($n=2\,045$, 47%) were 25–44 years of age. The highest rates were observed in the age groups 25–44 years and 15–24 years, with 1.6 and 1.1 cases per 100 000 population, respectively (Figure 4). A relatively similar age distribution was observed for both men and women. The main difference was that the rate among the 15- to 24-year-old females was much higher than among the 45- to 64-year-old females, while the rate was similar for males in both age groups.

Figure 4. Distribution of dengue rate per 100 000 population, by age and gender, EU/EEA, 2019

In 2019, France ($n=9$), Spain ($n=2$) and Germany (1) reported autochthonous dengue cases. The other cases were travel-related. In 2019, information on the probable country of infection was available for 3 725 travel-related cases and the individuals involved had acquired their infection in a variety of probable countries (101 countries). The majority of these cases ($n=2\,370$; 64%) were infected in Asia, mainly in Thailand ($n=926$; 39%) and India ($n=364$; 15%).

Discussion

In 2019, there was a sharp increase in the number of travel-related cases compared to previous years. The increase was observed among cases probably infected in Africa, the Americas, Asia and Oceania, which indicates that there was an increase in virus transmission in 2019 on a global scale [4]. Asia remains the region where the majority of the cases were infected.

The age and gender distribution of the dengue cases reported in the EU/EEA most probably reflects the demographic characteristics of travellers rather than other risk factors.

The peak in the number of cases observed in the autumn mainly reflects an increased transmission of the virus in the probable countries of infection due to climatic conditions favourable to vector activity and viral replication during this period of the year. The variation in the number of returning travellers also contributes to the seasonality among travel-related cases, but to a lesser extent [5].

In 2019, within the EU/EEA five autochthonous transmission events of dengue virus were reported: three vector-borne transmission events, two in France and one in Spain, one sexual transmission event in Spain and one needle-related injury event in Germany [6-11]. Vector-borne transmission events of dengue virus within the EU/EEA are expected in areas where *Aedes albopictus* is established and when environmental conditions are suitable for vector activity and virus replication (roughly from early summer to mid-autumn) [12]. Similar vector-borne transmission events have occurred several times since 2010 [6]. However, sexual transmission of dengue virus had never been described in the EU/EEA or elsewhere before. The risk related to sexual transmission (both among men who have sex with men and heterosexuals) is considered to be extremely low [11]. Although rare, transmission of dengue virus via needle has been described previously [13-16]. Laboratory workers and healthcare workers potentially in contact with infectious material and/or viraemic patients should be aware of the risk and take appropriate precautionary measures.

Public health implications

Vigilance regarding travel-related cases of dengue and other *Aedes*-borne infections remains essential. Public health authorities in the EU/EEA should consider raising awareness among clinicians and travel clinic specialists of the risk related to such diseases – in particular when and where vector-borne secondary transmission may take place [12]. The detection of an autochthonous case in the EU/EEA should trigger epidemiological and entomological investigations to assess the size of the transmission area and the potential for onward transmission, and to guide vector control measures.

Aedes aegypti, the primary vector for dengue virus transmission globally, is not established in the EU/EEA, but the species is established around the Black Sea and in several EU Overseas Countries and Territories (e.g. Anguilla, Aruba, French Polynesia) and Outermost Regions (e.g. Madeira, Martinique, La Réunion). The introduction and subsequent establishment of *Aedes aegypti* in the EU/EEA would certainly increase the likelihood of autochthonous transmission events occurring within the region.

Transmission of dengue virus through transfusion of erythrocytes, platelets and plasma [17-22], as well as through kidney, liver and bone marrow transplantation, has been documented [23,24]. Therefore, measures should be implemented to prevent dengue virus transmission via substances of human origin for travellers returning from affected areas and in response to autochthonous transmission within the EU/EEA. These measures may include donor deferral, donor/donation screening, blood donation quarantine, post-donation information and pathogen inactivation of plasma and platelets [25].

While a licensed dengue vaccine targeting people with previous exposure to dengue virus has recently been put on the market [26], prevention mainly involves protection against mosquito bites. *Aedes* mosquitoes have diurnal biting activities in both indoor and outdoor environments. Personal protection measures should therefore be taken all day long and especially during the hours of highest mosquito activity (mid-morning and late afternoon to twilight) [27].

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