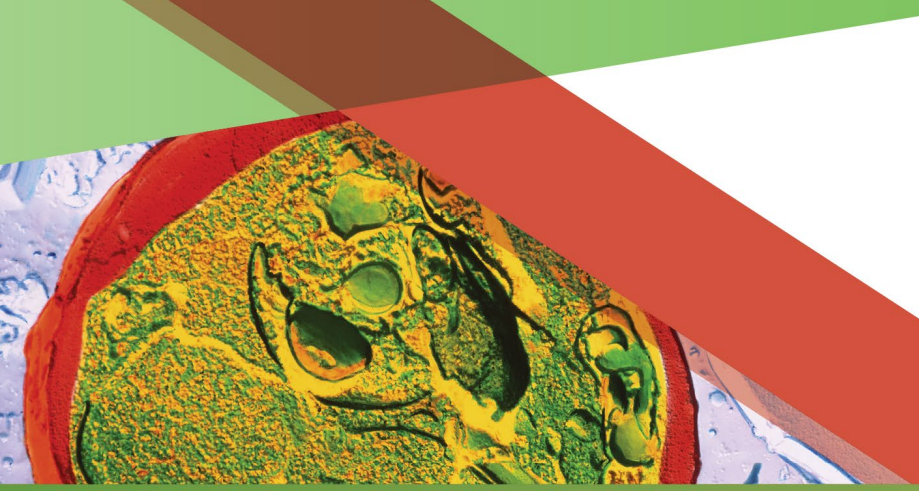


SURVEILLANCE REPORT

Malaria

Annual Epidemiological Report for 2017

Key facts

- For 2017, 8 401 cases were reported in the EU/EEA, 8 393 (99.9%) of which were confirmed.
- Among 8 023 cases with known importation status, 99.8% were travel-related. Twenty-one confirmed cases were reported as acquired in the EU (7 each by Greece and Italy, 3 by the UK, 2 by France and one each by Germany and Spain).
- A marked seasonal trend was observed across all countries, with cases increasing during and immediately after the summer holiday months (July–September).
- As in previous years, the overall rate of confirmed malaria cases was higher among men than women (1.7 cases and 0.8 cases per 100 000 population respectively; male-to-female ratio 1.9:1).

Methods

This report is based on data for 2017 retrieved from The European Surveillance System (TESSy) on 11 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].

For 2017, 30 EU/EEA countries reported data on malaria. Twenty-eight countries reported case-based data and two reported aggregated data (Belgium and Bulgaria). Twenty-five countries used the EU case definition, three (Denmark, France and Germany) used an alternative case definition and two (Belgium and Finland) did not specify the case definition they used. Reporting is compulsory in 28 countries, voluntary in France and 'other' in the United Kingdom. Surveillance is comprehensive and mostly passive.

Epidemiology

For 2017, 8 401 cases were reported in the EU/EEA, 8 393 (99.9%) of which were confirmed. France reported the highest number of cases, followed by the United Kingdom and Germany (Table 1, Figure 1).

Suggested citation: European Centre for Disease Prevention and Control. Malaria. In: ECDC. Annual epidemiological report for 2017. Stockholm: ECDC; 2019.

Stockholm, July 2019

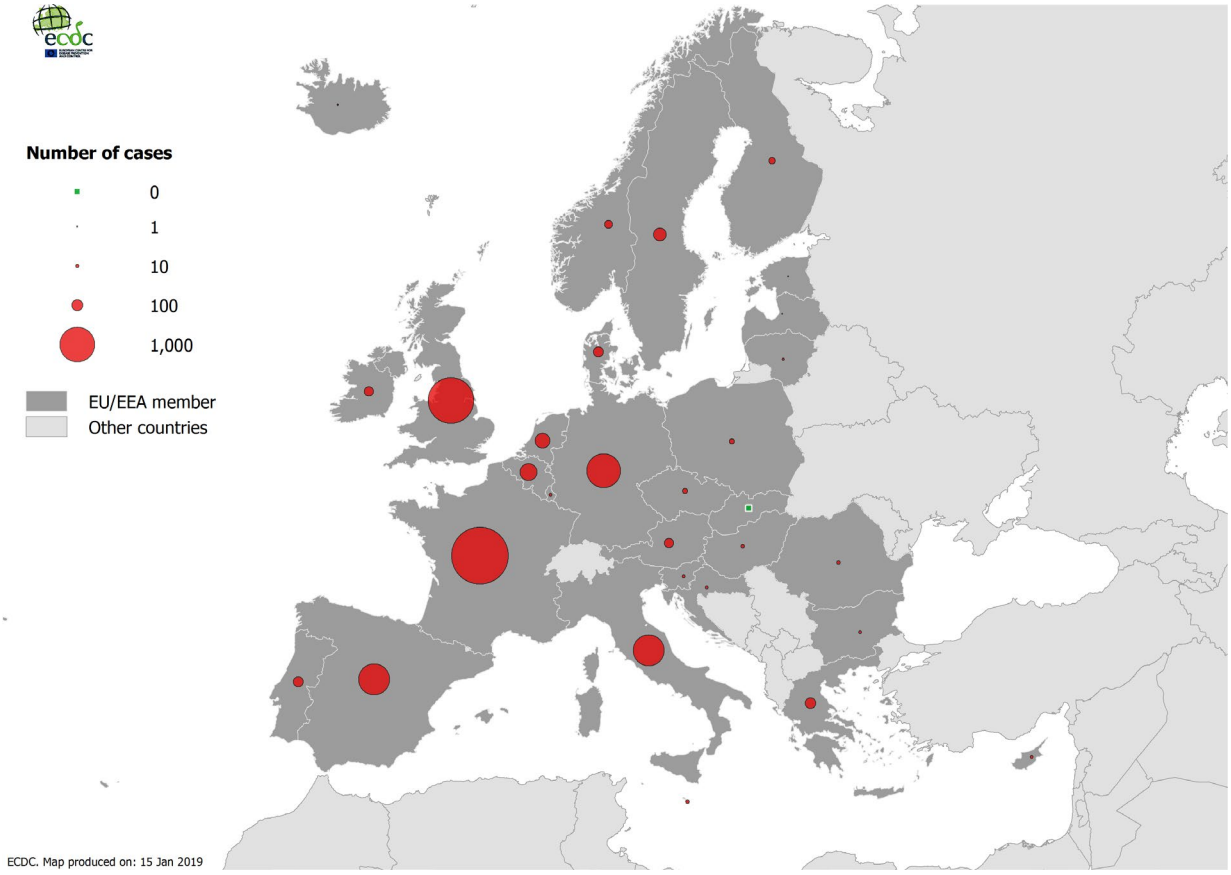
The overall notification rate was 1.2 cases per 100 000 population, the same as in 2016. The notification rate was highest in the United Kingdom (2.7 per 100 000 population). For France, no notification rate was calculated since reporting is voluntary. Age-standardised notification rates did not differ substantially from crude rates (Table 1).

Table 1. Distribution of confirmed malaria cases and rates per 100 000 population by country and year, EU/EEA, 2013–2017

Country	2013		2014		2015		2016		2017			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Confirmed cases	Rate	ASR	Reported cases
Austria	42	0.5	68	0.8	81	0.9	82	0.9	78	0.9	0.9	78
Belgium	253	-	235	-	276	-	311	-	249	-	-	249
Bulgaria	8	0.1	10	0.1	20	0.3	28	0.4	8	0.1	0.1	8
Croatia	0	0.0	6	0.1	7	0.2	4	0.1	10	0.2	0.2	10
Cyprus	3	0.3	8	0.9	3	0.4	1	0.1	8	0.9	0.9	8
Czech Republic	27	0.3	30	0.3	29	0.3	38	0.4	27	0.3	0.2	27
Denmark	63	1.1	102	1.8	101	1.8	102	1.8	94	1.6	1.7	94
Estonia	3	0.2	3	0.2	4	0.3	1	0.1	2	0.2	0.2	2
Finland	38	0.7	39	0.7	39	0.7	47	0.9	36	0.7	0.7	36
France	2 165	-	2 299	-	2 500	-	2 447	-	2 712	-	-	2 712
Germany	638	0.8	1 007	1.2	1 061	1.3	961	1.2	956	1.2	1.2	956
Greece	25	0.2	38	0.3	84	0.8	121	1.1	107	1.0	1.1	107
Hungary	5	0.1	15	0.2	12	0.1	17	0.2	12	0.1	0.1	12
Iceland	.	.	.	.	.	.	2	0.6	3	0.9	0.9	3
Ireland	71	1.5	79	1.7	82	1.8	88	1.9	78	1.6	1.6	78
Italy	677	1.1	705	1.2	706	1.2	888	1.5	830	1.4	1.5	830
Latvia	4	0.2	6	0.3	1	0.1	3	0.2	1	0.1	0.1	1
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.
Lithuania	8	0.3	5	0.2	8	0.3	3	0.1	6	0.2	0.2	6
Luxembourg	4	0.7	3	0.5	1	0.2	5	0.9	11	1.9	1.8	11
Malta	5	1.2	3	0.7	7	1.6	7	1.6	12	2.6	2.5	12
Netherlands	162	1.0	276	1.6	680	4.0	245	1.4	202	1.2	1.3	202
Norway	72	1.4	120	2.3	94	1.8	75	1.4	61	1.2	1.2	61
Poland	36	0.1	19	0.0	29	0.1	38	0.1	27	0.1	0.1	27
Portugal	117	1.1	144	1.4	194	1.9	197	1.9	92	0.9	0.9	93
Romania	43	0.2	47	0.2	30	0.2	21	0.1	15	0.1	0.1	15
Slovakia	4	0.1	5	0.1	0	0.0	4	0.1	0	0.0	0.0	1
Slovenia	3	0.1	7	0.3	5	0.2	6	0.3	11	0.5	0.5	11
Spain	518	1.1	688	1.5	706	1.5	755	1.6	818	1.8	1.8	824
Sweden	119	1.2	354	3.7	250	2.6	154	1.6	150	1.5	1.6	150
United Kingdom	1 501	2.3	1 510	2.3	1 397	2.2	1 574	2.4	1 777	2.7	2.8	1 777
EU/EEA	**6 614**	**1.0**	**7 831**	**1.2**	**8 407**	**1.3**	**8 225**	**1.2**	**8 393**	**1.2**	**1.3**	**8 401**

Source: country reports.
ASR: age-standardised rate
-: no rate calculated
.: no data reported.

Figure 1. Distribution of confirmed malaria cases by country, EU/EEA, 2017



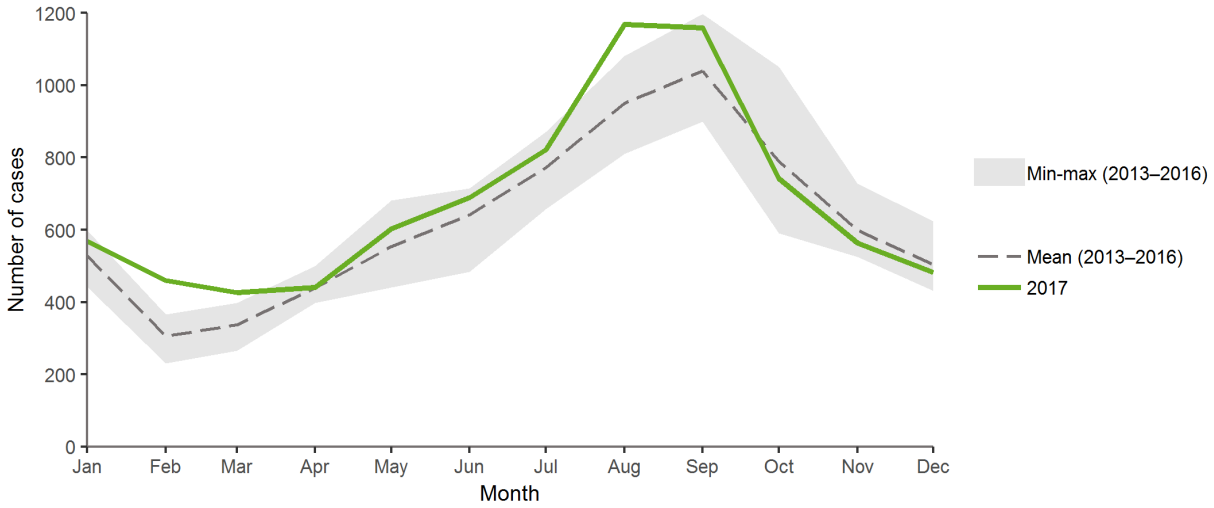
Among 4 874 confirmed cases for which the *Plasmodium* species was reported, 3 989 (81.8%) had *P. falciparum,* 492 (10.1%) *P. vivax,* 241 (4.9%) *P. ovale,* 130 (2.7%) *P. malariae,* 3 (0.1%) *P. knowlesi* and 19 cases (0.4%) were mixed infections with various *Plasmodium* species. The case fatality was 1.1% among all 2 944 malaria cases with known outcome and 1.5% among 1 220 cases with *P. falciparum* malaria and known outcome.

Among the 8 023 cases with known importation status, 99.8% were travel-related. Twenty-one confirmed cases were reported as acquired in the EU (six *Plasmodium vivax* and one *P. falciparum* by Greece, six *P. falciparum* and one *P. ovale* by Italy, three British *P. vivax* infected in Cyprus, two of unknown *Plasmodium* species by France and one *P. falciparum* each by Germany and Spain).

From 2013–2015, the notification rate increased. In 2016, it declined slightly and has been stable since (Table 1).

A marked seasonal trend was observed across all countries, with cases increasing during and immediately after the summer holiday months (July–September). Compared with the mean seasonal trend over 2013–2016, the peak was higher in 2017 (Figure 2).

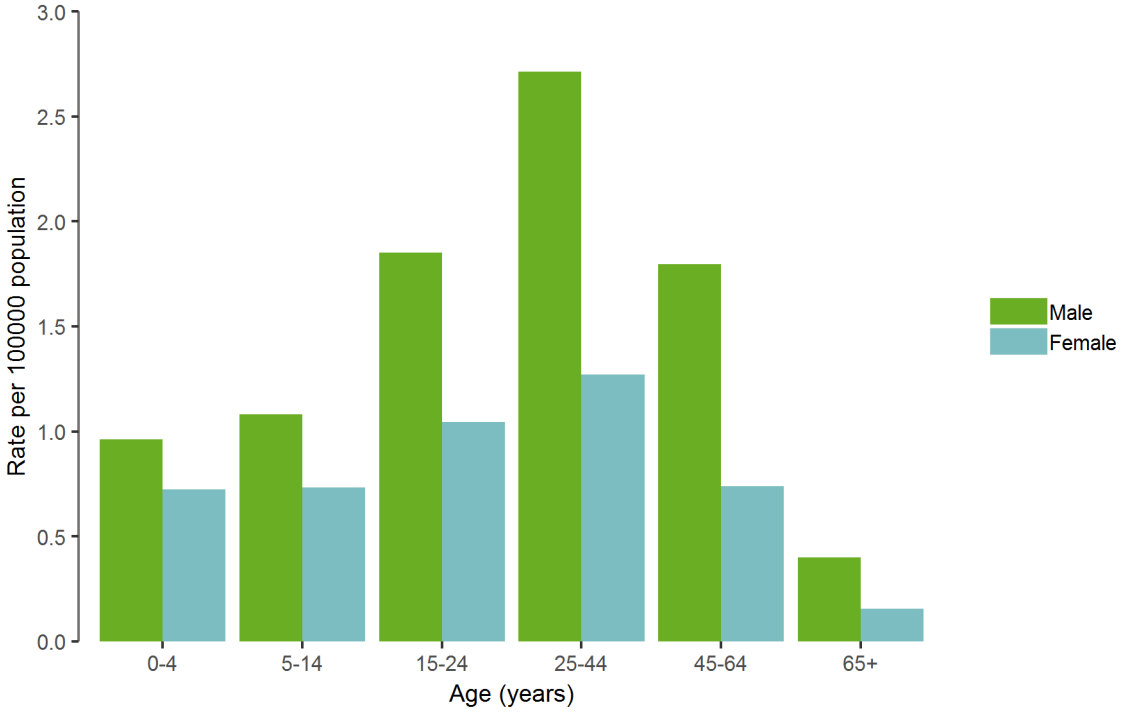
Figure 2. Distribution of confirmed malaria cases by month, EU/EEA, 2013–2016 and 2017



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

In 2017, the overall rate of confirmed malaria cases was higher among men than women (1.7 and 0.8 cases per 100 000 population respectively; male-to-female ratio: 1.9:1). In both men and women, the notification rate was highest in the age group 25–44 years (2.7 and 1.3 cases per 100 000 population respectively), followed by 15–24 years (Figure 3).

Figure 3. Distribution of confirmed malaria cases per 100 000 population by age and gender, EU/EEA, 2017



Discussion

According to WHO, in 2017, an estimated 219 million malaria cases and 435 000 related deaths occurred worldwide [4]. The incidence rate of malaria is estimated to have decreased by 18% globally between 2010 and 2017, but the declining trend seems to pause from 2015–2017. The WHO Region of the Americas reported an increase. Likewise, malaria mortality rates fell worldwide from 2010–2017, except in the WHO Region of the Americas, and the reduction has slowed down since 2015.

Plasmodium falciparum is the most prevalent malaria parasite in sub-Saharan Africa (100%), the Western Pacific (72%), Eastern Mediterranean (69%) and South East Asia (63%), while *Plasmodium vivax* is the dominant malaria species in the Americas (74%) [4].The reduction in global malaria incidence has so far not resulted in a significant decline of the notification rate observed in the EU/EEA.

Nearly all malaria cases reported by EU/EEA countries for 2017 were imported. The countries reporting the highest numbers of cases have historical, economic, linguistic and cultural links with endemic areas, particularly in Africa and the Americas. Most of the imported malaria cases in France and the United Kingdom are linked to travel routes from West Africa [5]. Seasonality and age distribution of cases in Europe most likely reflect travel patterns to malaria-endemic countries. Recent literature suggests that a substantial proportion of imported malaria cases in the EU/EEA occur among recent immigrants from malaria-endemic countries and more settled migrants and their families who have travelled to visit friends and relatives in malaria-endemic home countries [6]. Outside Europe, certain EU territories are endemic for malaria, including French Guiana and Mayotte. Data for these regions are not collected through TESSy.

A small number (21) of sporadic autochthonous malaria cases, either hospital-acquired or due to vector-borne transmission, were reported in the EU/EEA in 2017, but no sustained transmission has been reported [7–10].

Public health implications

Awareness about malaria among clinicians and travellers, particularly among people visiting friends and relatives in malaria-endemic countries, should remain high. In Europe, malaria chemoprophylaxis is only recommended for travellers to malaria-endemic countries, which are classified in several groups to determine the most effective drug regimen (see WHO requirements and recommendations for international travellers, including yellow fever and malaria, including a list of countries, territories and areas as of 2018 [11]). The choice of prophylactic drugs and prevention measures also depends mainly on local malaria epidemiology, duration of potential exposure to vectors, parasite resistance pattern, level and seasonality of transmission, prophylactic drugs tolerance, age and pregnancy. Because of the nocturnal feeding habits of most *Anopheles* mosquitoes, protection measures against mosquito bites include the use of (preferably long-lasting insecticidal) bed nets, clothes that cover most of the body and insect repellent on exposed skin.

Vigilance should remain with regard to malaria transmission through substances of human origin, e.g. blood products or organ transplants. Healthcare providers should be aware that hospital transmission of malaria is rare but possible, irrespective of the *Plasmodium* species involved. Therefore, clinicians should consider the possibility of hospital-acquired malaria in hospitalised or recently discharged patients who develop an unexplained fever or a malaria-like clinical syndrome, especially if their hospital admission coincided with that of another patient admitted with malaria [10].

Data also indicate that local transmission of *P. vivax* remains possible in the EU due to sporadic reports of introduced cases. This emphasises the need for continuous malaria surveillance, preparedness and prevention in the EU/EEA.

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