

Malaria

Annual Epidemiological Report for 2018

Key facts

- For 2018, 8 349 malaria cases were reported in the EU/EEA, 8 347 (> 99%) of which were confirmed.
- Among 7 338 cases with known importation status, 99.8% were travel related. Fourteen confirmed cases were reported as acquired in the EU (ten by Greece, two by Spain, and one each by France and Italy).
- 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 (1.6 cases and 0.7 cases per 100 000 population, respectively; male-to-female ratio 1.9:1).

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].

For 2018, 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. Surveillance is comprehensive and mostly passive. Reporting is compulsory in 28 countries, voluntary in France, and 'other' in the United Kingdom. Therefore, no notification rate was calculated for France.

Epidemiology

For 2018, 8 349 malaria cases were reported in the EU/EEA, 8 347 (> 99%) 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 2018. Stockholm: ECDC; 2020.

Stockholm, April 2020

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The overall notification rate was 1.2 cases per 100 000 population, the same as in 2016 and 2017. The notification rate was highest in the United Kingdom (2.5 per 100 000 population). 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, 2014–2018

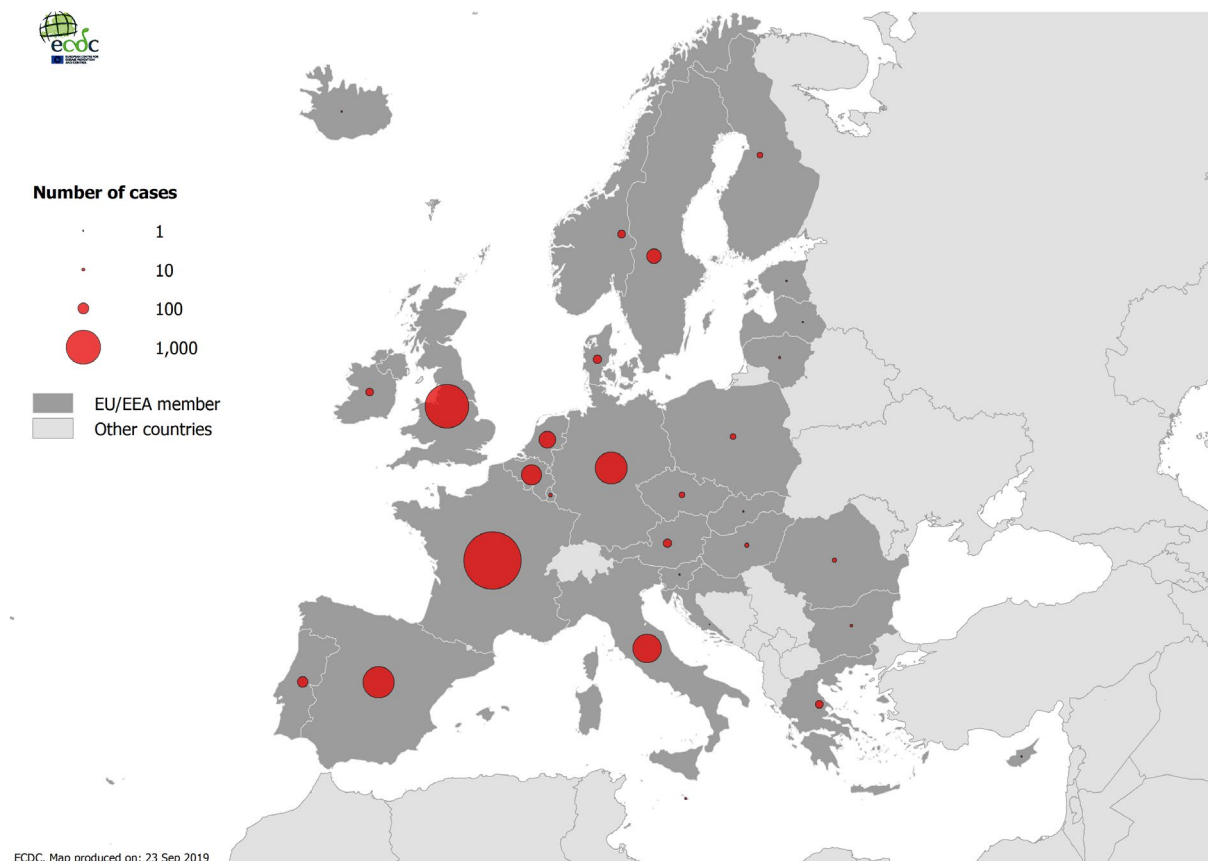
Country	2014		2015		2016		2017		2018			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Confirmed cases	Rate	ASR	Reported cases
Austria	68	0.8	81	0.9	82	0.9	78	0.9	62	0.7	0.7	62
Belgium	235	-	276	-	311	-	249	-	357	-	-	357
Bulgaria	10	0.1	20	0.3	28	0.4	8	0.1	8	0.1	0.1	8
Croatia	6	0.1	7	0.2	4	0.1	10	0.2	2	0.0	0.0	2
Cyprus	8	0.9	3	0.4	1	0.1	8	0.9	4	0.5	0.5	4
Czechia	30	0.3	29	0.3	38	0.4	27	0.3	34	0.3	0.3	36
Denmark	102	1.8	101	1.8	102	1.8	94	1.6	64	1.1	1.2	64
Estonia	3	0.2	4	0.3	1	0.1	2	0.2	3	0.2	0.2	3
Finland	39	0.7	39	0.7	47	0.9	36	0.7	34	0.6	0.7	34
France	2299	-	2500	-	2447	-	2712	-	2840	-	-	2840
Germany	1007	1.2	1061	1.3	962	1.2	957	1.2	896	1.1	1.2	896
Greece	38	0.3	84	0.8	121	1.1	107	1.0	55	0.5	0.6	55
Hungary	15	0.2	12	0.1	17	0.2	12	0.1	17	0.2	0.2	17
Iceland	.	.	.	.	2	0.6	3	0.9	3	0.9	0.9	3
Ireland	79	1.7	82	1.8	88	1.9	78	1.6	60	1.2	1.2	60
Italy	705	1.2	706	1.2	888	1.5	830	1.4	722	1.2	1.3	722
Latvia	6	0.3	1	0.1	3	0.2	1	0.1	4	0.2	0.2	4
Lithuania	5	0.2	8	0.3	3	0.1	6	0.2	6	0.2	0.2	6
Luxembourg	3	0.5	1	0.2	5	0.9	11	1.9	13	2.2	2.1	13
Malta	3	0.7	7	1.6	7	1.6	12	2.6	7	1.5	1.5	7
Netherlands	276	1.6	680	4.0	245	1.4	202	1.2	252	1.5	1.5	252
Norway	120	2.3	94	1.8	75	1.4	61	1.2	54	1.0	1.0	54
Poland	19	0.0	29	0.1	38	0.1	27	0.1	28	0.1	0.1	28
Portugal	144	1.4	194	1.9	197	1.9	92	0.9	102	1.0	1.0	102
Romania	47	0.2	30	0.2	21	0.1	15	0.1	18	0.1	0.1	18
Slovakia	5	0.1	0	0.0	4	0.1	0	0.0	3	0.1	0.1	3
Slovenia	7	0.3	5	0.2	6	0.3	11	0.5	3	0.1	0.2	3
Spain	688	1.5	706	1.5	755	1.6	818	1.8	851	1.8	1.9	851
Sweden	354	3.7	250	2.6	154	1.6	150	1.5	189	1.9	2.0	189
United Kingdom	1510	2.3	1397	2.2	1574	2.4	1810	2.7	1656	2.5	2.6	1656
EU/EEA	7831	1.2	8407	1.3	8226	1.2	8427	1.2	8347	1.2	1.2	8349

Source: country reports.

ASR: age-standardised rate

-.: no rate calculated

..: no data reported.

Figure 1. Distribution of confirmed malaria cases by country, EU/EEA, 2018

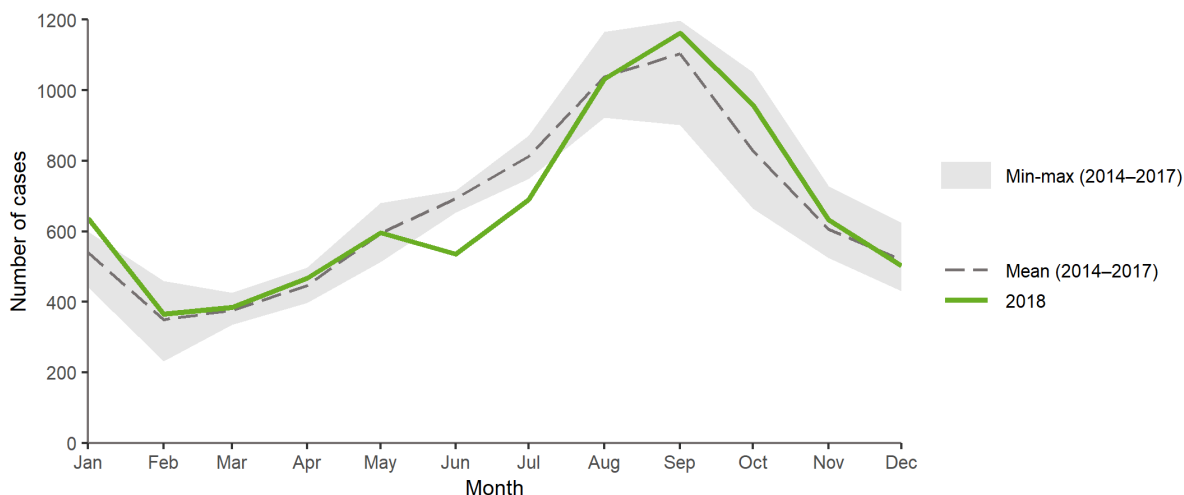
Of 4 516 confirmed cases for which the *Plasmodium* species was reported, 3 793 (84.0%) had *P. falciparum*, 339 (7.5%) had *P. vivax*, 236 (5.2%) had *P. ovale*, 135 (3.0%) had *P. malariae*, 3 (0.1%) had *P. knowlesi*, one case had *P. cynomolgi* [4] and nine cases (0.2%) were mixed infections with various *Plasmodium* species. The case fatality was 0.8% among all 3 424 malaria cases with known outcome and 1.0% among 1 616 cases of *P. falciparum* malaria with known outcome.

Among the 7 338 confirmed cases with known importation status, 99.8% were travel-related. Fourteen confirmed cases were reported as acquired in the EU (ten *P. vivax* by Greece, one of unknown *Plasmodium* species by France, one *P. falciparum*, one mixed *P. malariae* and *P. ovale* infection by Spain and one *P. falciparum* by Italy).

The notification rate has been stable since 2014 (Table 1).

A marked seasonal trend was observed across the 26 countries consistently reporting malaria from 2014 to 2018, with cases increasing during and immediately after the summer holiday months (July–September). Compared with the mean seasonal trend 2014–2017, the peak was higher in 2018 (Figure 2).

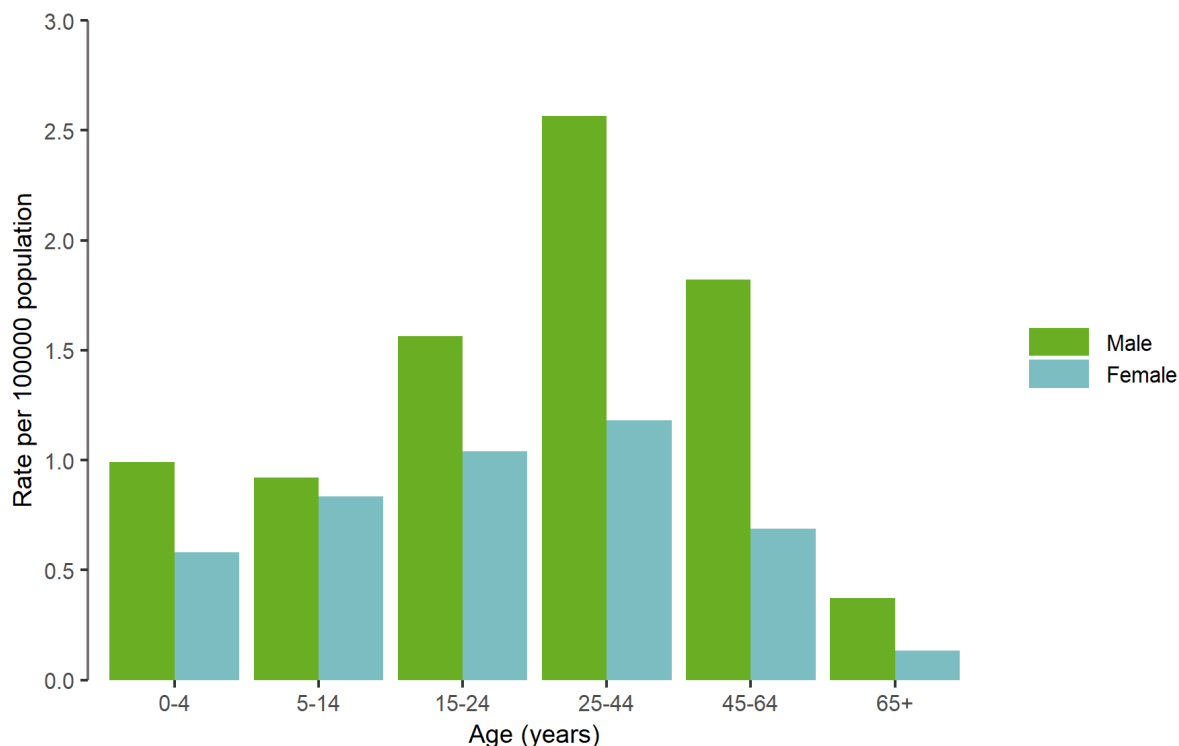
Figure 2. Distribution of confirmed malaria cases by month, EU/EEA, 2018 and 2014–2017



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

In 2018, the overall rate of confirmed malaria cases was higher among men than women (1.6 and 0.7 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 (2.6 and 1.2 cases per 100 000 population, respectively), followed by 45–64 years for men (1.8) and 15–24 years for women (1.0) (Figure 3).

Figure 3. Distribution of confirmed malaria cases per 100 000 population, by age and gender, EU/EEA, 2018



Discussion

According to WHO, in 2018, an estimated 228 million malaria cases and 405 000 related deaths occurred worldwide [5]. The incidence rate of malaria is estimated to have decreased by 20% globally between 2010 and 2018, but the declining trend has halted after 2014. In the WHO South-East Asia and African regions, case incidence declined, while the WHO Region of the Americas recorded a rise. All other WHO regions recorded either little progress or an increase in incidence rate.

Plasmodium falciparum is the most prevalent malaria parasite in sub-Saharan Africa (99.7%), the Eastern Mediterranean (71%), the Western Pacific (65%), and South-East Asia (50%), while *P. vivax* is the dominant malaria species in the Americas (75%) [5]. The reduction in global malaria incidence between 2010 and 2014 has 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 2018 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 [6]. Seasonality and age distribution of cases in Europe most likely reflect travel patterns to malaria-endemic countries. 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 [7]. 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 (16) of sporadic autochthonous malaria cases, either hospital acquired or due to vector-borne transmission, were reported in the EU/EEA in 2018, but no sustained transmission has been reported [8–11].

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 into several groups to determine the most effective drug regimen (see WHO requirements and recommendations for international travellers, including a list of affected countries, territories and areas as of 2018 [12]). The choice of prophylactic drugs and prevention measures depends mainly on local malaria epidemiology, duration of potential exposure to vectors, parasite resistance patterns, level and seasonality of transmission, prophylactic drug 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 high 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 malaria-like clinical syndrome, especially if their hospital admission coincided with that of another patient admitted with malaria [11].

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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