

# Congenital toxoplasmosis

## Annual Epidemiological Report for 2020

### Key facts

- In 2020, 133 confirmed cases of congenital toxoplasmosis were reported in the EU/EEA, with France accounting for 83% of all the confirmed cases due to its active screening of pregnant women.
- The overall notification rate in the EU/EEA was 5.08 cases per 100 000 live births.
- The number of reported cases and the notification rate of congenital toxoplasmosis in the EU/EEA has been decreasing from 2016 to 2020.

### Introduction

Toxoplasmosis is an infection caused by the parasite *Toxoplasma gondii*. Cats are the definitive hosts of the parasite and play an important role in the spread of the disease. Infected cats can shed toxoplasma oocysts in faeces and contaminate the environment. Humans and other animals can become infected either by ingesting the oocysts (by direct contact with cats, or through food and water contaminated by cat faeces). The infection results in the formation of infectious tissue cysts in various tissues of the body. Humans can get an infection by eating poorly cooked meat containing cysts. Toxoplasmosis is not passed from person-to-person, except in instances of mother-to-child (congenital) transmission. Pregnant women, even without symptoms, may transmit the infection to the foetus, which can result in abortion, stillbirth, perinatal death (due to disseminated toxoplasmosis), or congenital infection with severe health problems including brain damage (hydrocephalus or microcephaly), blindness, and deafness.

### Methods

This report is based on data for 2020 retrieved from The European Surveillance System (TESSy) on 9 October 2022. TESSy is a system for the collection, analysis, and dissemination of data on communicable diseases.

For a detailed description of the methods used to produce this report, please refer to the 'Methods' chapter in the 'Introduction to the Annual Epidemiological Report' [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].

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In 2020, data for congenital toxoplasmosis were reported by 20 EU/EEA countries. Denmark, Italy, the Netherlands, Norway, Portugal, and Sweden do not have surveillance systems for toxoplasmosis. No data for 2020 were reported by the United Kingdom (UK) due to their withdrawal from the EU on 31 January 2020.

Surveillance in Spain did not cover the entire country or provide an estimation of the population covered by surveillance. Therefore, no notification rate was calculated. All the reporting Member States used the EU case definition from 2008, 2012, or 2018 (the case definition remained the same), except two which used other (not specified) case definitions. All the countries reported case-based data, except Bulgaria which reported aggregated data.

Six countries (Austria, Belgium, France, Greece, Slovakia, and Slovenia) have an active surveillance of congenital cases with compulsory screening of pregnant women (Table 1). However, Austria, Belgium and Greece do not report their data to ECDC. Four countries (Bulgaria, Czechia, Germany, and Hungary) have voluntary screening. Nine countries have no screening policies and/or surveillance of congenital toxoplasmosis in pregnant women, but three of these countries report their data to ECDC (Tables 1 and 2).

France regularly reports the highest number of cases of congenital toxoplasmosis, most likely due to its sensitive surveillance system that includes the screening of pregnant women, follow-up of individuals testing negative in order to detect infection during pregnancy, and laboratory confirmation of any cases of congenital toxoplasmosis detected during the process, including asymptomatic cases.

**Table 1. Overview of screening policies for pregnant women to detect congenital toxoplasmosis (ECDC survey, 2016)**

Country	No screening	Compulsory screening	Voluntary screening	Report to TESSy	Comments
Austria		x		No	Since 1974, serological screening of pregnant women starting in the first trimester has been implemented. There is monthly follow-up of seronegative women during pregnancy.
Belgium		x		No	Serological screening of pregnant women starting in the first trimester is implemented. There is no consensus on the follow-up of seronegative women during pregnancy.
Bulgaria			x	Yes	
Czechia			x	Yes	Serological screening is only offered in certain regions and gynaecological outpatient wards. The screening is not covered by statutory health insurance.
Denmark	x			No	Surveillance and serological screening of pregnant women was active from 1999 to 2007.
Estonia	x			Yes	
France		x		Yes	Serological screening of pregnant women starting in the first trimester is implemented. There is follow-up of seronegative women during pregnancy.
Germany			x	Yes	The screening is not covered by statutory health insurance.
Greece		x		No	Congenital toxoplasmosis is under surveillance through the mandatory notification form (but not toxoplasmosis in general). Screening is performed during pregnancy through serological and ultrasound testing, and if there are such indications and compatible symptoms in the foetus.
Hungary			x	Yes	
Iceland	x			Yes	Suspected cases are tested on an individual basis.
Ireland	x			Yes	Testing for <i>Toxoplasma gondii</i> is requested if there are clinical indications (e.g. a woman is symptomatic) for investigation of late miscarriage, or if there are ultrasound findings consistent with congenital toxoplasmosis.
Malta	x			No	
Netherlands	x			No	
Norway	x			No	

Country	No screening	Compulsory screening	Voluntary screening	Report to TESSy	Comments
Slovakia		x		Yes	Serological screening of pregnant women starting in the first trimester is implemented. There is follow-up of seronegative women during pregnancy.
Slovenia		x		Yes	
Sweden	x			No	Suspected cases or women at high risk of infection are tested on an individual basis.
United Kingdom	x			Yes (until 2020)	

## Epidemiology

For 2020, 20 EU/EEA countries reported 133 cases of toxoplasmosis, all of which were classified as confirmed. France accounted for 83% of all the cases. The number of notifications per 100 000 live births was 5.08 cases in the EU/EEA, with the highest rate in France (14.95), followed by Poland and Germany (2.53 and 1.81 cases per 100 000 live births, respectively) (Table 2, Figure 1). The remaining 17 countries reported no cases. Out of 109 cases with known outcome, five were reported to have died, accounting for an EU/EEA case fatality rate of 3.8%.

**Table 2. Number of confirmed cases of congenital toxoplasmosis and rates per 100 000 live births by country and year, EU/EEA, 2016–2020**

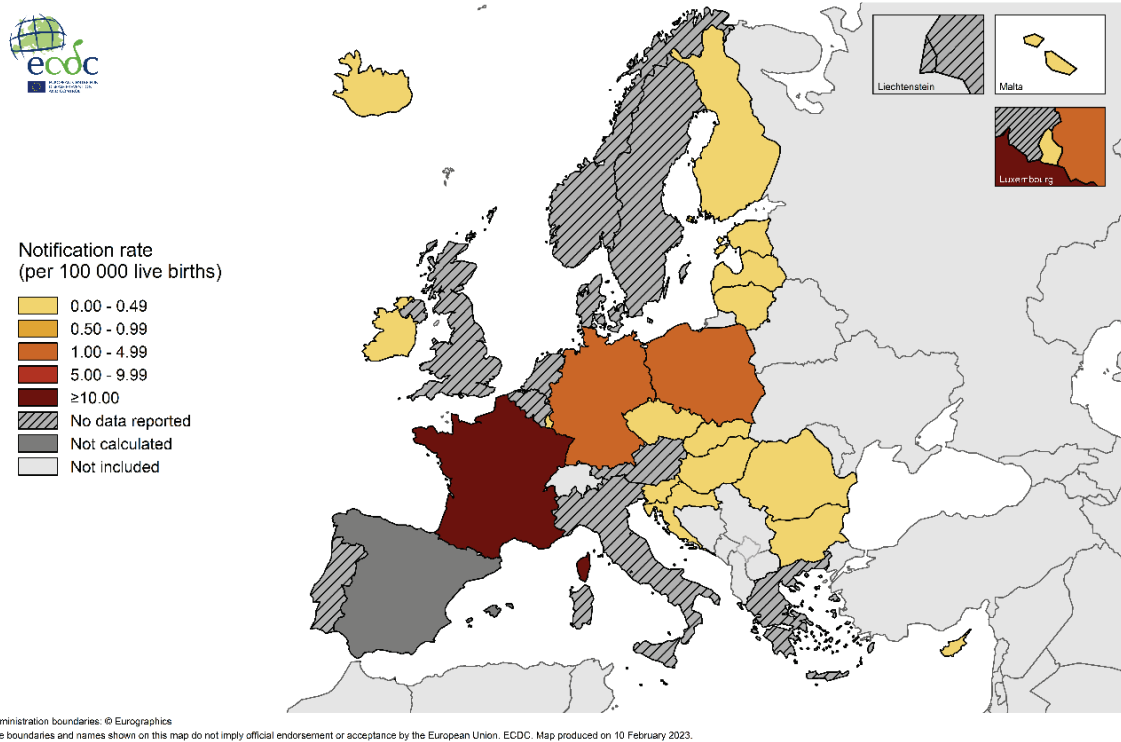
Country	2016		2017		2018		2019		2020	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Austria	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Belgium	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Bulgaria	0	0.00	2	3.13	0	0.00	0	0.00	0	0.00
Croatia	0	0.00	0	0.00	1	2.71	0	0.00	0	0.00
Cyprus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Czechia	0	0.00	2	1.75	0	0.00	1	0.89	0	0.00
Denmark	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Estonia	0	0.00	0	0.00	1	6.96	0	0.00	0	0.00
Finland	1	1.89	0	0.00	0	0.00	0	0.00	0	0.00
France	195	24.86	153	19.87	151	19.89	134	17.77	110	14.95
Germany	10	1.26	8	1.02	18	2.29	17	2.18	14	1.81
Greece	NRC	NRC	0	0.00	0	0.00	0	0.00	NDR	NDR
Hungary	0	0.00	0	0.00	0	0.00	1	1.07	0	0.00
Iceland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Ireland	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Italy	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Latvia	0	0.00	0	0.00	0	0.00	1	5.32	0	0.00
Liechtenstein	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Lithuania	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Luxembourg	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Malta	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Netherlands	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Norway	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Poland	20	5.23	18	4.48	25	6.44	14	3.73	9	2.53
Portugal	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
Romania	0	0.00	0	0.00	1	0.48	0	0.00	0	0.00
Slovakia	2	3.47	0	0.00	0	0.00	0	0.00	0	0.00
Slovenia	1	4.92	2	9.88	2	10.21	1	5.17	0	0.00
Spain	5	NRC	3	NRC	2	NRC	0	NRC	0	NRC
Sweden	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
United Kingdom	8	1.03	7	0.93	7	0.96	7	0.98	NDR	NDR
<b>EU/EEA</b>	<b>242</b>	<b>6.71</b>	<b>195</b>	<b>5.34</b>	<b>208</b>	<b>5.82</b>	<b>176</b>	<b>5.07</b>	<b>133</b>	<b>5.08</b>

Source: Country reports

NDR: No data reported

NRC: No rate calculated

**Figure 1. Number of confirmed cases of congenital toxoplasmosis per 100 000 live births by country, EU/EEA, 2020**

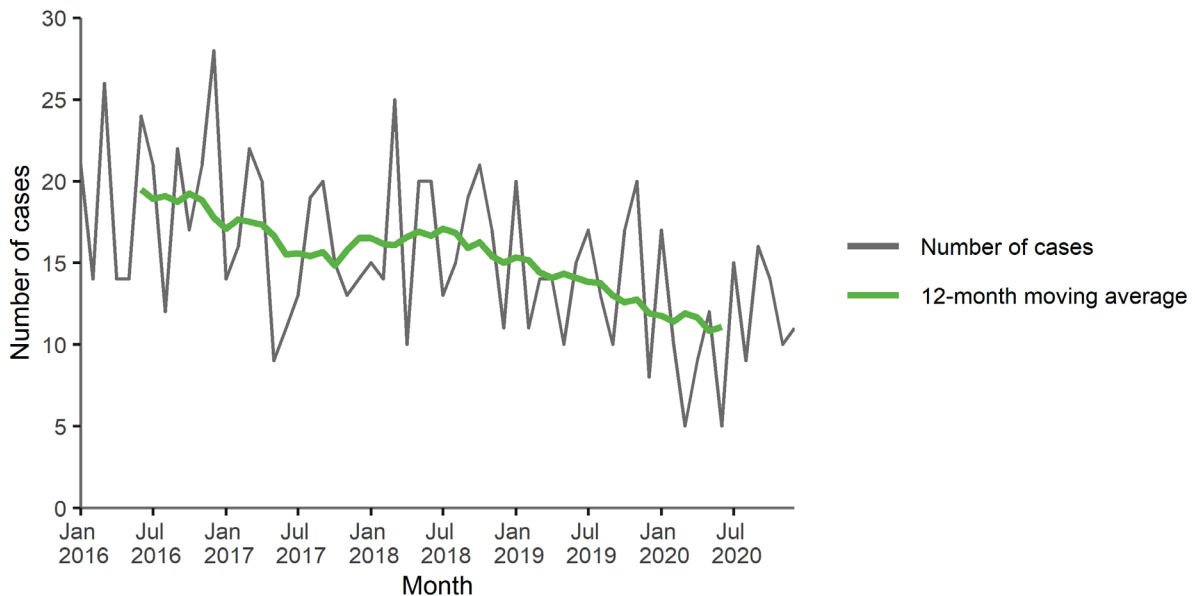


Source: Country reports

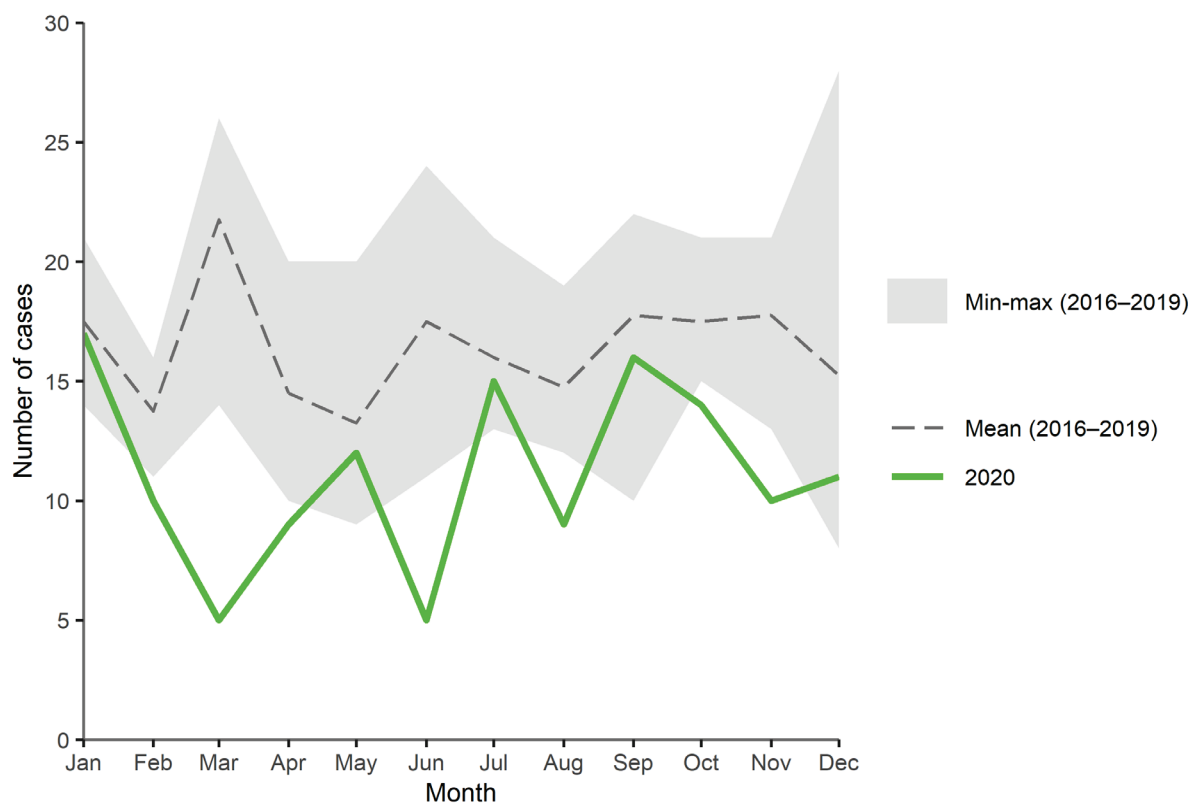
The number of cases of congenital toxoplasmosis at the EU/EEA level decreased from 2016 to 2020 (Table 2, Figure 2).

The reported cases of congenital toxoplasmosis fluctuated over the years with no discernible seasonality. In 2020, the number of reported cases was lower than the average compared to the same month in 2016 to 2019 (Figure 3).

**Figure 2. Number of confirmed cases of congenital toxoplasmosis by month, EU/EEA, 2016–2020**



Source: Country reports from Cyprus, Czechia, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia, and Spain

**Figure 3. Number of confirmed cases of congenital toxoplasmosis by month, EU/EEA, 2020 and 2016–2019**

Source: Country reports from Cyprus, Czechia, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovakia, Slovenia, and Spain

## Outbreaks and other threats

No threats of congenital toxoplasmosis were detected or reported through ECDC's Epidemic Intelligence Information System for Food- and Waterborne Diseases and Zoonoses (EPIS-FWD) in 2020.

## Discussion

Cases of congenital toxoplasmosis in the EU/EEA decreased from 2016 to 2020. This was mainly due to the decreased number of cases reported by France, which still accounted for the majority (78%) of all the reported cases during that period [3]. The comparatively high number of cases reported by France can be explained by the sensitive surveillance system in place and the rigorous screening system that includes active screening of pregnant women, with follow-up of the individuals who are seronegative, combined with the laboratory reporting of cases of congenital toxoplasmosis detected during screening [4]. The most notable decrease in the reported cases of congenital toxoplasmosis in France occurred in 2016 (there were 195 cases in 2016, as compared to 246 cases in 2015; a decrease of 21%) and continued in subsequent years, with the lowest rate in 2020 [3]. Decreased seroprevalence in pregnant women in France and a decreased number of seroconversions during pregnancy have been reported from 1995 to 2016, with further estimated decreases by 2020 [5]. This may reflect a true decrease of infections in France which explains the decreasing number of reported cases. The decrease in seroprevalence has been largely attributed to a reduced exposure to contaminated meat due to better husbandry practices, as well as changes in methods of food storage and preparation [5]. Between 2019 and 2020, the number of reported cases in France decreased by almost 20% suggesting an additional effect of the COVID-19 pandemic.

Due to the varying set up in the surveillance of congenital toxoplasmosis, and the absence of reporting or zero reporting of cases from 27 EU/EEA countries, the actual prevalence of the disease in the EU/EEA cannot be estimated and limits an assessment of the burden of this form of the disease. This may reflect discussions about the cost-effectiveness of screening pregnant women in preventing or reducing the impact of congenital toxoplasmosis. The cost benefits of prenatal screening programmes have been debated because of the low prevalence of congenital toxoplasmosis in the EU/EEA and uncertainty about the effectiveness of prenatal treatment [7].

A retrospective study of the Austrian national prenatal screening programme concluded that from 1992 to 2008, it had saved societal costs of more than EUR 15 million per year and EUR 258 million in 17 years [8]. In France, 79% of maternal infections which were prospectively followed and treated, did not result in clinical symptoms in newborns, and birth defects occurred in less than 1% of infants [4]. If disability-adjusted life years (DALY) are taken as a measure of the burden of disease, congenital toxoplasmosis at 2.42 DALYs per case is at the same level as hepatitis B and invasive pneumococcal infection in the EU/EEA [6].

Pregnant women even without symptoms may transmit the toxoplasma parasite to the foetus, which can result in abortion, still-birth, perinatal death, or congenital toxoplasmosis infection with severe health problems affecting, for example, the eyes and brain of infants. Foetuses infected before birth often show no symptoms at birth but may develop them later in life with potential mental disability due to brain damage, vision loss and deafness. Infection in individuals with impaired immunity tends to severely affect the central nervous system, but other organs may also be affected. Such patients may require prolonged (sometimes life-long) therapy.

Nanotechnology is currently being investigated as a tool to detect and manage infections caused by *T. gondii*, as well as to develop vaccines using messenger ribonucleic acid (mRNA) sequences coding for disease-specific antigens [9]. These developments could prove useful in the diagnosis, treatment, and possible prevention of congenital toxoplasmosis. Undercooked meat, especially pork, lamb, and wild game meat, soil contaminated with cat faeces on raw fruits and vegetables are the major sources of food-borne transmission for humans. Food-borne transmissions can be prevented by production practices that reduce *T. gondii* in meat, adequate cooking of meat, washing of raw fruits and vegetables, prevention of cross-contamination in the kitchen, and measures that decrease the spread of viable oocysts into the environment [10].

## Public health implications

Toxoplasmosis in pregnant women can result in congenital toxoplasmosis and severe outcomes in infected foetuses. The burden of this form of the disease in the EU/EEA cannot be assessed due to large differences between national surveillance systems, screening programmes and follow-up procedures of pregnant women. Regardless of national strategies for surveillance, it is important to reinforce options for the prevention of congenital toxoplasmosis. Pregnant women should receive information on the risks of exposure to *T. gondii* and necessary preventive measures.

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