

TBE in Belgium

Marjan Van Esbroeck, Tinne Lernout and Steven Van Gucht

ECDC risk status: affected (last edited in May 2025, update for 2024: 2 reported cases)

History and current situation

Until 2018, only imported cases of TBE were detected in Belgium, mainly infected in other parts of Europe such as Estonia, Germany¹, Austria, Scandinavia, Slovenia² and the Czech Republic, but also Kyrgyzstan, Russia and the USA. In the summer of 2020, the first three confirmed autochthonous cases were diagnosed at the National Reference Centre of arboviruses (the Institute of Tropical Medicine, Antwerp, Belgium)³. Already in 2018, two cases possibly/probably infected in Belgium were reported, but patients had also traveled during the incubation period. No autochthonous cases have been detected since 2020 (Figure 1). The distribution of reported cases by age and gender is comparable to what is observed in other European countries, with a higher number of cases in males, and more cases in the older age groups (45+).

Based on the current epidemiological findings, Belgium is classified as an affected country for TBE, with possible presence of the virus spread over the territory (Figure 2).

The finding of autochthonous cases was not surprising as several (sero)prevalence studies in sentinel animals suggested that the virus had been circulating at a low level for at least several years. Depending on the animal species, prevalence rates ranging from 0.11% in dogs in 2009 (Belgium) to 9.27% in wild boars in 2019/2020 (Flanders)

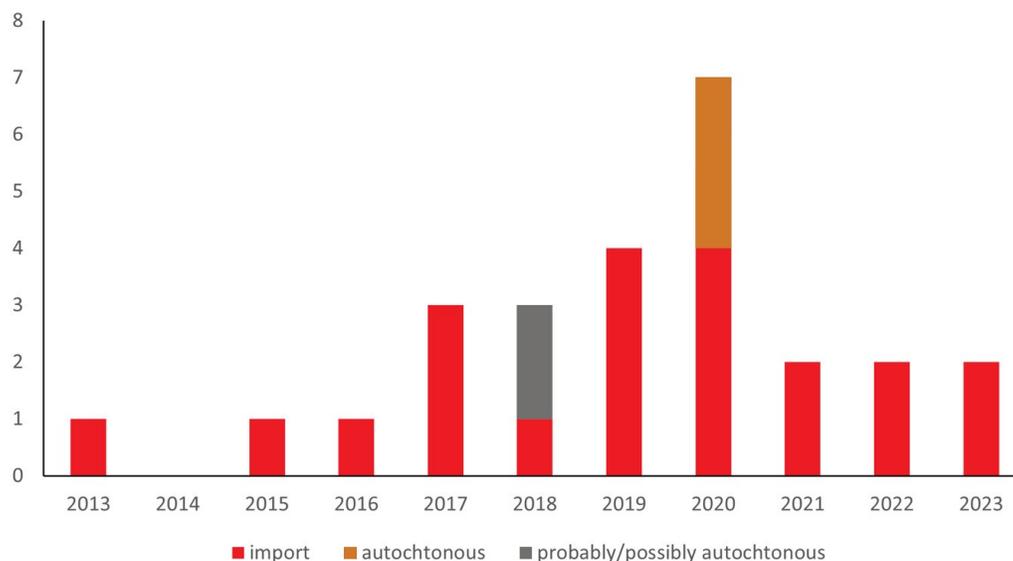
have been reported.⁴⁻⁸ The results of the study on wild boars in 2020 suggest an increase in TBEV prevalence over the last decade.⁸

Two out of the three patients with an autochthonous infection, diagnosed in 2020, had been exposed in a geographical location adjacent to an area with known TBEV seropositivity in animals.³

Several screening programs set up to detect TBEV in ticks, have been undertaken since 2017. Screening for TBEV by PCR in 1,307 ticks collected through flagging in the surrounding nature of the autochthonous cases in 2018, 2019, 2022 and 2023 did not reveal the presence of TBEV (Van Esbroeck, personal communication). Using a citizen science approach based on an existing notification tool for tick bites, 1,599 and 928 ticks removed from humans, 99% of which belonged to *Ixodes ricinus*, were collected across Belgium in 2017 and 2021 respectively. None of the ticks tested positive for TBEV by PCR.⁸⁻¹⁰

In 2019, a seroprevalence study in Flanders among 195 forestry workers exposed to tick bites during professional activities, of which 85% with more than 10 years of exposure and 42% reporting at least one tick bite/month during the tick season, revealed that none had antibodies showing evidence of infection.¹¹

Figure 1: TBE case numbers over time, vaccination status unknown. Update for 2024: 2 reported cases



Overview of TBE in Belgium

Table 1: TBE in Belgium	
Viral subtypes, distribution	No information available in humans. No virus-positive animals or ticks have been reported to date.
Reservoir animals	Seropositive cattle and sheep at national level and roe deer and wild boar in Flanders have been identified ⁴⁻⁸
Percentage infected ticks	No positive ticks have been detected ⁸⁻¹⁰ (Van Esbroeck personal communication)
Dairy product transmission	No information available
Case definition used by authorities	ECDC case definitions
Completeness of case detection and reporting	No information available
Type of reporting	Annual reporting to the ECDC
Other TBE surveillance	<ol style="list-style-type: none"> 1. A national reference center (NRC) for TBE performs laboratory confirmation in suspected human cases 2. Ad hoc seroprevalence monitoring in animals⁴⁻⁸ 3. PCR testing of ticks collected from humans, from animals and by flagging⁸⁻¹⁰ (Van Esbroeck personal communication)
Special clinical features	No
Licensed vaccines	FSME-IMMUN (Pfizer)
Vaccine recommendations	In the current epidemiological setting, vaccination is only recommended for travelers to endemic regions doing outdoor activities in forested areas during the tick season and for people handling TBEV in a laboratory setting ¹²
Vaccine uptake	No data available
National Reference center for TBE	Institute of Tropical Medicine, Nationalestraat 155, 2000 Antwerp, Belgium, +32 3 247 64 45. www.itg.be

Figure 2: Cumulative sites of TBEV-infection in Belgium, 2018-2023



■ Animal positive serology ■ Human (probable) autochthonous infection

Acknowledgments

The National Reference Center for TBE is partially supported by the Belgian Ministry of Social Affairs through a fund within the Health Insurance System.

The Belgian Institute for Health, Sciensano is supported by the Belgian regional authorities (Department of Care and Agency for Nature and Forests (Flanders), and Agency for a qualitative life (Wallonia)).

Authors and affiliations

Marjan Van Esbroeck, Department of Clinical Sciences, Institute of Tropical Medicine, Antwerp

Tinne Lernout, Belgian institute for health Sciensano, Brussels

Steven Van Gucht, Belgian institute for health Sciensano, Brussels

Contact: mvesbroeck@itg.be

Citation:

Van Esbroeck M, Lernout T, Van Gucht S. TBE in Belgium. Chapter 13. In: Dobler G, Erber W, Bröker M, Chitimia-Dobler L, Schmitt HJ, eds. *The TBE Book*. 7th ed. Singapore: Global Health Press; 2024. doi:10.33442/26613980_13-3-7

References

- Gils S, Frans J, Ho E, et al. Case report: tick-borne encephalitis (TBE) in a Belgian traveller returning from Germany. *J Travel Med*. 2018;25(1):10.1093/jtm/tay078. doi:10.1093/jtm/tay078
- Du Four S, Mertens R, Wiels W, De Keyser J, Bissay V, Flamez A. Meningoencephaloradiculitis following infection with tick borne encephalitis virus: case report and review of the literature. *Acta Neurol Belg*. 2018;118(1):93-96. doi:10.1007/s13760-017-0873-9
- Stoefs A, Heyndrickx L, De Winter J, et al. Autochthonous Cases of Tick-Borne Encephalitis, Belgium, 2020. *Emerg Infect Dis*. 2021;27(8):2179-2182. doi:10.3201/eid2708.211175
- Roelandt S, Heyman P, De Filette M, et al. Tick-borne encephalitis virus seropositive dog detected in Belgium: screening of the canine population as sentinels for public health. *Vector Borne Zoonotic Dis*. 2011;11(10):1371-1376. doi:10.1089/vbz.2011.0647
- Roelandt S*, Suin V*, Riocreux F, et al. Autochthonous tick-borne encephalitis virus-seropositive cattle in Belgium: a risk-based targeted serological survey. *Vector Borne Zoonotic Dis*. 2014;14:640-7. doi:10.1089/vbz.2014.1576. *Equal contribution.
- Tavernier P, Sys SU, De Clercq K, et al. Serologic screening for 13 infectious agents in roe deer (*Capreolus capreolus*) in Flanders. *Infect Ecol Epidemiol*. 2015;5:29862. Published 2015 Nov 24. doi:10.3402/iee.v5.29862
- Roelandt S, Suin V, Van der Stede Y, et al. First TBEV serological screening in Flemish wild boar. *Infect Ecol Epidemiol*. 2016;6:31099. Published 2016 Apr 15. doi:10.3402/iee.v6.31099
- Adjadj NR, Vervaeke M, Sohier C, Cargnel M, De Regge N. Tick-Borne Encephalitis Virus Prevalence in Sheep, Wild Boar and Ticks in Belgium. *Viruses*. 2022;14(11):2362. Published 2022 Oct 26. doi:10.3390/v14112362
- Lernout T, De Regge N, Tersago K, Fonville M, Suin V, Sprong H. Prevalence of pathogens in ticks collected from humans through citizen science in Belgium. *Parasit Vectors*. 2019;12(1):550. Published 2019 Nov 21. doi:10.1186/s13071-019-3806-z
- Geebelen L, Philippe C, Hermy M, Mori M, Lernout T. Recherche de pathogènes chez les tiques, 2021. Accessed March 27, 2023. https://www.sciensano.be/sites/default/files/pathogenes_chez_les_tiques_2021_final.pdf
- Lernout T, Roelandt A, Vandervelden J, et al. Epidemiological situation of tick-borne encephalitis in Belgium, an overview. Poster presented at the International Symposium on Tick-Borne Pathogens and Disease ITPD; October 22-25, 2023; Vienna, Austria.
- Superior Health Council. Vaccination against Tick-Borne Encephalitis (TBE). Brussels. Report nr 9435. Accessed February 29, 2019. https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/shc_9435_tbe.pdf