# Epidemiological situation of tick-borne encephalitis in Belgium, an overview

**Tinne Lernout[1], Alessandra Roelandt[2], Joris Vandervelden[3], Nadjah Radia Adjadj[1], Camille Philippe[1], Laurence Geebelen[1], Hein Sprong[4], Leo Heyndrickx[5], Marcella Mori[1], Nick De Regge[1], Marjan Van Esbroeck[5]**

1. Sciensano, Belgian Institute of Health, Brussels, Belgium; 2. IDEWE, Occupational Health and Safety service, Brussels, Belgium; 3. Agency for Nature & Forests (ANB), Brussels, Belgium; 4. Centre for Infectious Disease Control, National Institute for Public Health and Environment (RIVM), Bilthoven, The Netherlands; 5. National Reference Center for arboviruses, Institute of Tropical Medicine, Antwerp, Belgium

## Conclusions

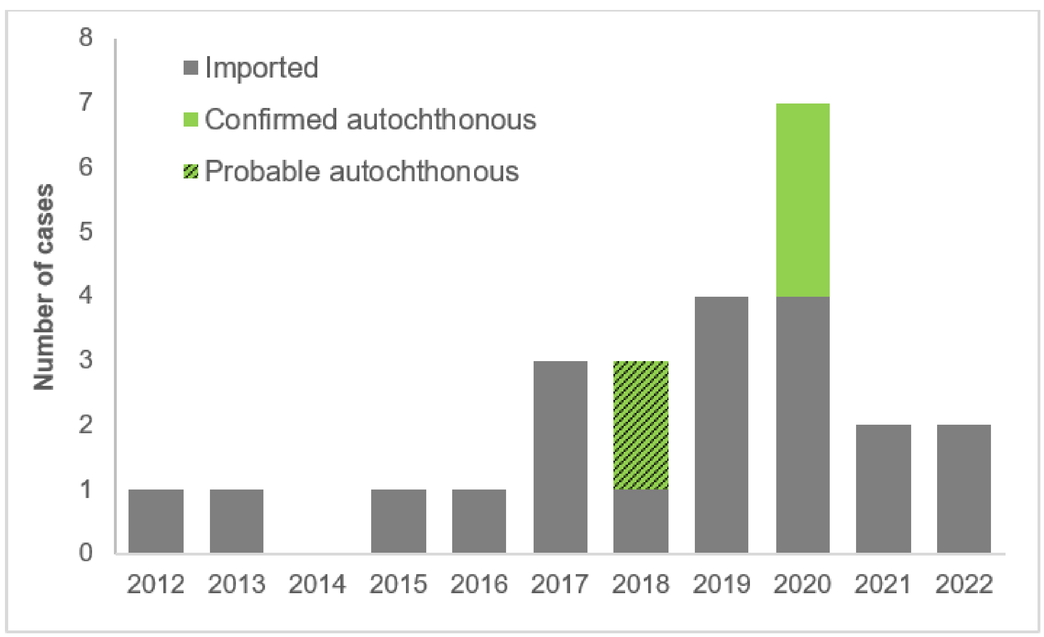
- **Seroprevalence studies in animals indicate that the tick-borne encephalitis (TBE) virus has been circulating in Belgium since more than a decade, with prevalence rates ranging between 0.11% (in dogs) and 9.27% (in wild boars)**
- **Human autochthonous cases of TBE are rarely detected, but underdiagnosis is suspected**
- **Overall the risk of infection for humans is still estimated to be very low and vaccination against the disease in Belgium is not recommended**

## Surveillance of TBE in humans

### Laboratory surveillance

- Reporting of positive results (IFAT/SNT) by the National Reference Centre for arboviruses since 2012[a]
- 0 to 4 imported cases per year
- First confirmed autochthonous cases in 2020[b]

**Yearly number of reported human cases of TBE by origin of infection, Belgium, 2012-2022**




### Seroprevalence study forestry workers (2019)

- 195 forestry workers of the Flemish Agency for Nature & Forests (ANB) exposed to tick bites during professional activities
- 85% of participants ≥ 10 years exposure; 42% of participants reported at least one tick bite/month during the tick season
- None had evidence of a recent or old infection (ELISA/SNT)

## Seroprevalence studies TBEV in animals

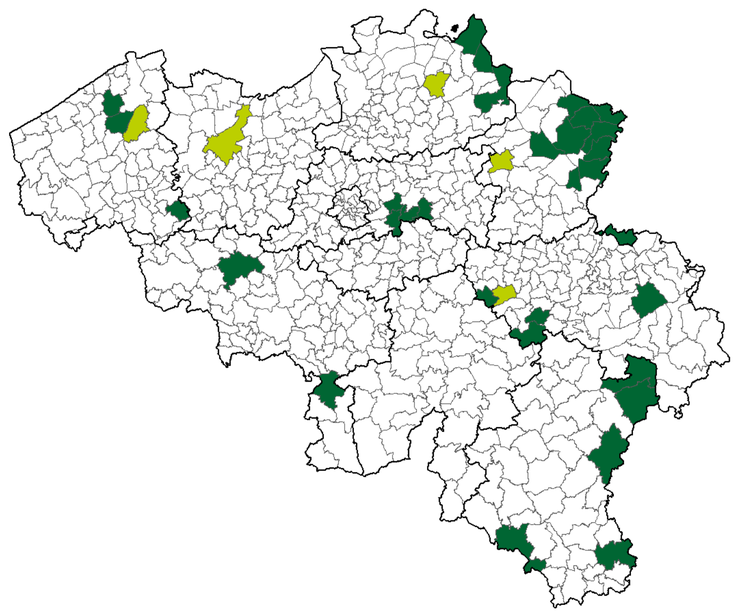
**Detection of TBEV antibodies (ELISA and SNT or PRNT) in domestic and wildlife animals since 2009**

| Species | Year | Sample size | Region | Seroprevalence |
|---|---|---|---|---|
| Dogs[c] | 2009 | 880 | Belgium | 0.11% |
| Cattle[d] | 2010 | 650 | Belgium | 2.61% |
| Roe deer[e] | 2011 | 498 | Belgium | 0.4% |
| Roe deer[f] | 2008-2013 | 98 | Flanders | 5.10% |
| Wild boar[g] | 2013 | 238 | Flanders | 2.91% |
| Sheep[h] | 2019 | 480 | Belgium | 0.42% |
| Wild boar[h] | 2019-2020 | 831 | Flanders | 9.27% |

## PCR testing TBEV in ticks

- Ticks removed from humans and animals or collected through flagging (around positive human or animal cases)
- About 5,000 ticks tested since 2017. All were negative

## Geographical distribution of positive TBEV results in humans and animals [a,b,c,d,g,h]



Animal positive serology  Human (probable) autochthonous infection

**REFERENCES**

a. NRC arboviruses. Institute of Tropical Medicine. https://www.sciensano.be/en/nrc-nrl/national-reference-center-nrc-arbovirus
b. Stoefs A et al. Emerg Infect Dis. 2021 Aug;27(8):2179-2182
c. Roelandt S et al. Vector Borne Zoonotic Dis. 2011 Oct;11(10):1371-6
d. Roelandt S et al. Vector Borne Zoonotic Dis. 2014 Sep;14(9):640-7
e. Linden A et al. Vet Rec. 2012 Jan;170(4):108
f. Tavernier P et al. Infection Ecology and Epidemiology 2015, 5: 29862
g. Roelandt S et al. Infect Ecol Epidemiol. 2016 Apr 15;6:31099
h. Adjadj NR et al. Viruses. 2022 Oct 26;14(11):2362

**ACKNOWLEDGEMENTS**

To the many people who contributed to the different surveillance systems and studies.

The monitoring of TBE is funded (mostly ad hoc) by the Belgian regional authorities (DZ, AViQ, ANB) and the National Insurance system (RIZIV-INAMI). Pfizer provided financial support for TBEV testing of ticks.

**Sciensano** • Tinne Lernout • T + 32 2 642 50 33 • tinne.lernout@sciensano.be • **www.sciensano.be**