

# TBE in Bulgaria

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**E-CDC risk status: endemic** (lack of consistent testing and reporting, data as of end 2023)

## History and current situation

First cases of probable tick-borne encephalitis (TBE) were reported in 1961 by Andonov et al in eastern regions of Bulgaria.<sup>1</sup> Possible TBE cases with the typical two-wave fever, originating from consumption of raw goat milk, were described back in 1953 by Vaptzarov et al in southern Bulgaria.<sup>2</sup> Investigations in the 1960s were able to isolate 3 tick-borne encephalitis virus (TBEV) strains from *Haemaphysalis punctata* and 1 from *Dermacentor marginatus* ticks from goats and sheep in the district of Plovdiv.<sup>3</sup> The antigenic properties of these 4 virus strains were identical to the highly virulent strain “Hypr” of the European subtype of TBEV (TBEV-EU).<sup>3</sup>

Laboratory diagnosis of TBE, based on serology using complement fixation assay, was introduced in Bulgaria in the 1970s. Since then single case reports of presumed TBE have been reported, but these lack reliable microbiological confirmation.<sup>4-5</sup> However, investigations of ticks between 1974 and 2002 detected TBEV in ticks in Bulgaria. A total of 6849 ticks were investigated, and 8 TBEV strains were isolated.<sup>6</sup>

Beginning in 2009, the National Reference Laboratory of Vector-Borne Pathogens introduced reliable laboratory diagnosis methods for TBE, based on polymerase chain reaction (PCR) and enzyme-linked immunosorbent assay (ELISA), and identified the first 3 confirmed TBE cases in Bulgaria: 2 cases in 2009 and 1 case in 2012.<sup>7</sup> Two more TBE cases were identified in 2015, one case was reported in 2017, one case in 2019, two cases in 2020 and one in 2021 (Fig. 1). Most of the cases reported in the last few years originate from a focus in Western Bulgaria close to the capital city (Fig.3).

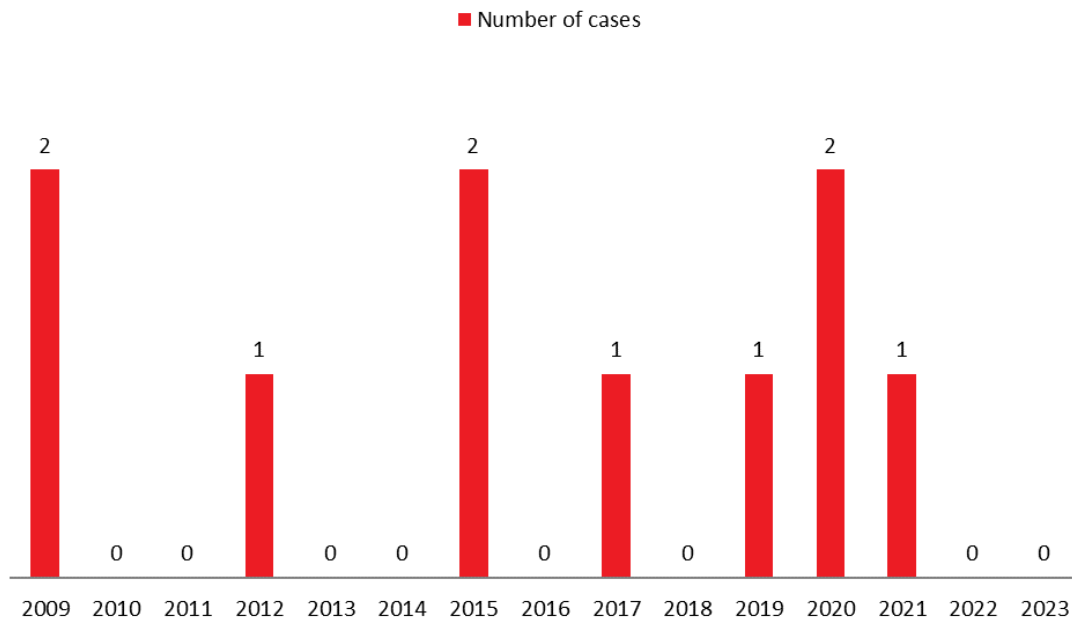
Nationwide seroprevalence survey on circulation of TBE virus in Bulgaria found an overall seroprevalence of 0.6% (Fig. 4). However, district analysis showed TBEV seroprevalence to be up to 4.0%-4.8%, indicating that the TBEV infection seems to be more widespread in the country than previously described.<sup>8-10</sup>

Though TBE cases are reported sporadically, TBEV circulates in Bulgaria, causing human cases, associated with either tick bites or consumption of unpasteurized milk.

## Overview of TBE in Bulgaria

Table 1: TBE in Bulgaria	
<b>Viral subtypes, distribution</b>	European subtype of TBEV (TBEV-EU) <sup>3</sup>
<b>Reservoir animals</b>	Not known
<b>Infected tick species (%)</b>	<i>Dermacentor marginatus</i> , <i>Haemaphysalis punctata</i>
<b>Dairy product transmission</b>	Yes
<b>Case definition used by authorities</b>	ECDC case definition for confirmed, probable, and possible TBE case
<b>Type of reporting</b>	Mandatory since 2014. Both physicians and laboratories must report cases.
<b>Other TBE surveillance</b>	No
<b>Special clinical features</b>	Biphasic disease
<b>Licensed vaccines</b>	None commercially available
<b>Vaccination recommendations</b>	No
<b>Vaccine uptake</b>	No
<b>Name, address/website of TBE NRC</b>	National reference laboratory of vector-borne pathogens at the National Center of Infectious and Parasitic Diseases, Sofia, Bulgaria <a href="http://www.ncipd.org">www.ncipd.org</a>

**Figure 1: Burden of TBE in Bulgaria over time (confirmed cases only)**

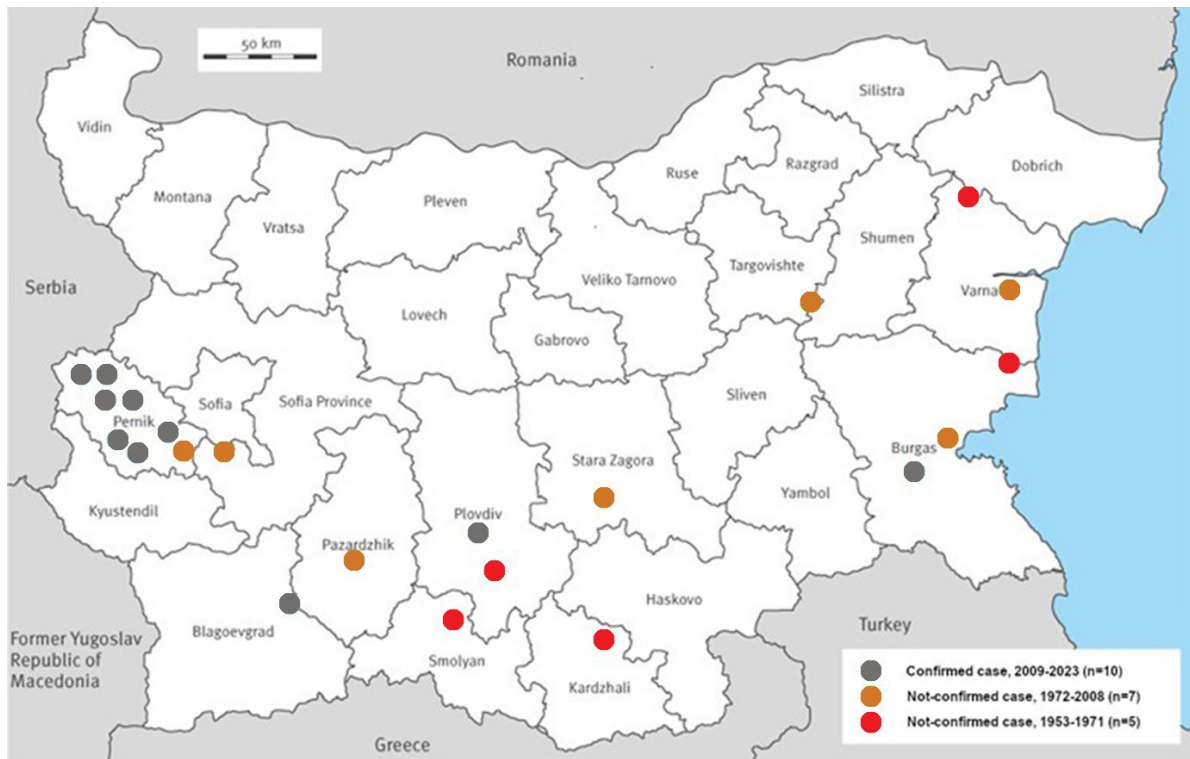


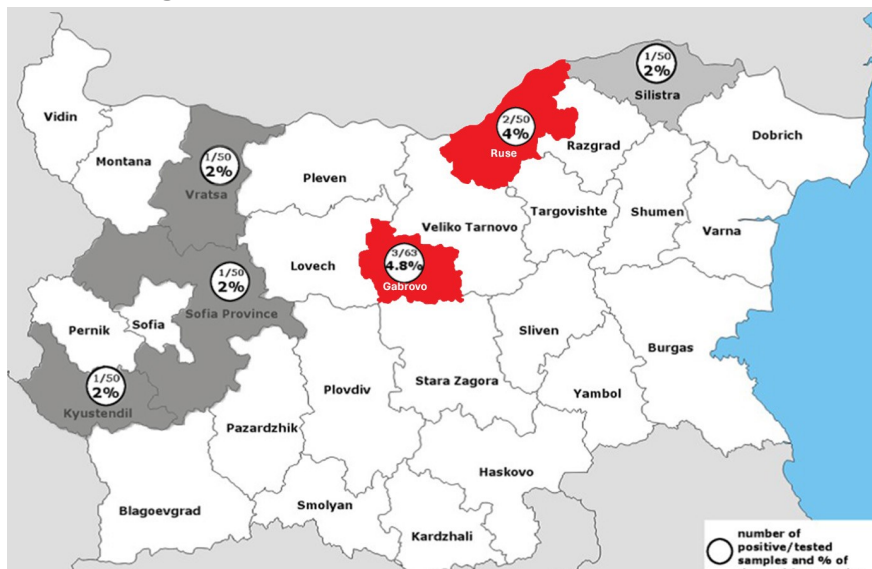
Source Data: Appendix—Figure 1

**Age and gender distribution of TBE in Bulgaria**

No table can be provided, the number of cases is too low to give any meaningful interpretation.

**Figure 2: Sites of TBEV infection in Bulgaria, 1953-2023**



**Figure 3: Seroprevalence in Bulgaria, in 2015**

## Appendix

Source data: Figure 1

Burden of TBE in Bulgaria over time

Year	Number of cases	Incidence / 10 <sup>5</sup>
2009	2	n.c.
2010	0	n.c.
2011	0	n.c.
2012	1	n.c.
2013	0	n.c.
2014	0	n.c.
2015	2	n.c.
2016	0	n.c.
2017	1	n.c.
2018	0	n.c.
2019	1	n.c.
2020	2	n.c.
2021	1	n.c.
2022	0	n.c.
2023	0	n.c.

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