TBE in Croatia

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E-CDC risk status: endemic (data as of end 2022)

History and current situation

Even though TBE has been a notifiable disease in Croatia since 2007, there are no or only limited data available on the occurring tick species in the endemic areas, on the prevalence of TBE virus (TBEV) in ticks, its distribution in Croatia, and its genetic characteristics. Reporting of human cases also is very scarce. The Central European subtype of virus (TBEV-EU) appears to be present in Croatia.

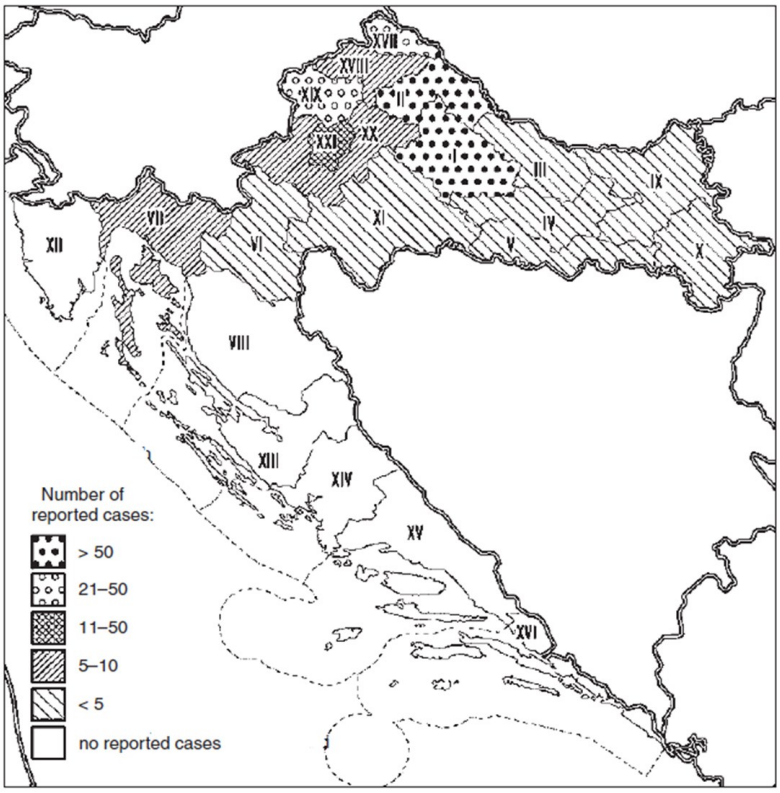
Natural foci of TBE have been found so far in the continental area in the northwestern region (between the Sava River and the Drava River, near Zagreb, Varaždin, Bjelovar, Koprivnica, Križevci, and Vinkovci – with an area around Slavonski Brod) and in the northeastern region (across a small area on the western outskirts of Osijek city).

Recently, 2 new natural foci have emerged in the central mountainous region, south of the Sava River. Cases are reported only sporadically in the Adriatic coastal region.[1]

A recent study found a prevalence of TBEV similar to other European countries (0.1%–5%) in ticks removed from red foxes in Varazdin County and Zagreb County (in the vicinity of Medvednica mountain), both well known as TBE areas. Furthermore, a viral prevalence of 1.1% (95% CI: 0.3%–3.0%) has been found in red deer (*Cervus elaphus*) from 2 areas in northeastern Croatia (Vukovar-Srijem County and Osijek-Baranja County). The latest human TBE cases from these 2 counties were recorded in 2009 (1 case) and 2010 (1 case), respectively.[2]

An average of 20 human cases of TBE is reported each year (minimum 11, maximum 45)[3,4] i.e., 0.26–1.05 cases/100,000 persons. The majority of cases were registered in the Koprivnica-Križevci County (average annual incidence 5.2/100,000), Međimurska County (5/100,000), and Bjelovar-Bilogora County (4.3/100,000). The average incidence rate in the city of Zagreb, within the observed period, was 0.2/100,000 (16 cases registered). In 2015, the first outbreak of TBE after consumption of raw goat milk was reported in 7 out of 10 exposed persons.[5]

Figure 1: Geographical distribution of TBE by counties of the Republic of Croatia (1999–2008)[3]



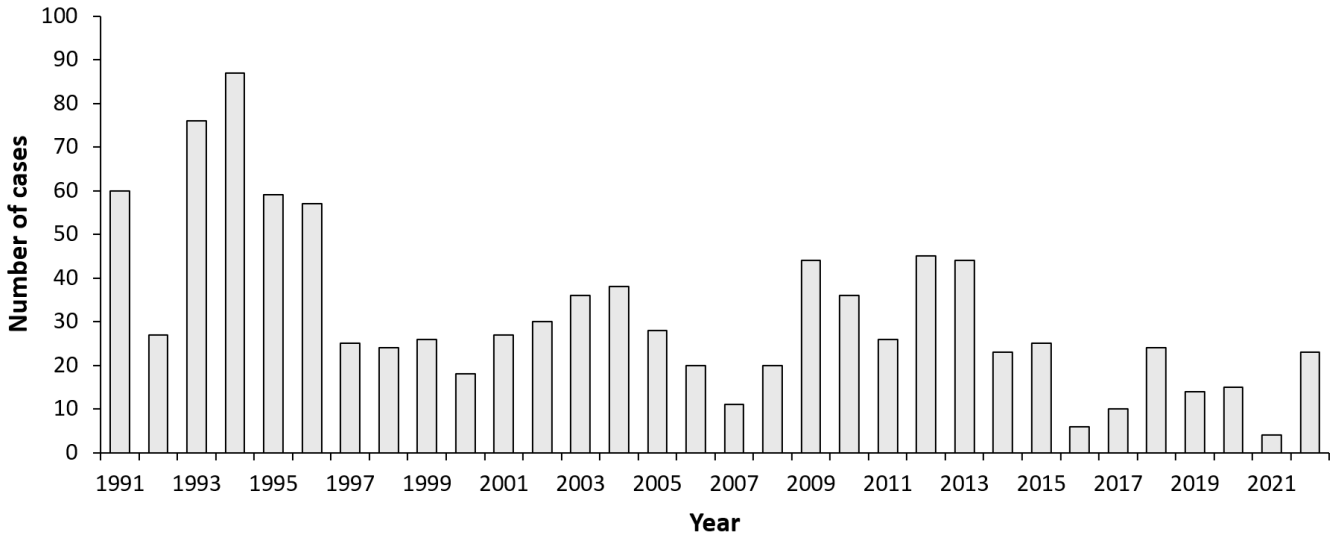
I. Bjelovarsko-bilogorska
II. Koprivničko-križevačka
III. Virovitičko-podravska
IV. Požeško-slavonska
V. Brodsko-posavska
VI. Karlovačka
VII. Primorsko-goranska
VIII. Ličko-senjska
IX. Osječko-baranjska
X. Vukovarsko-srijemska
XI. Sisačko-moslavačka
XII. Istarska
XIII. Zadarska
XIV. Šibensko-kninska
XV. Splitsko-dalmatinska
XVI. Dubrovačko-neretvanska
XVII. Međimurska
XVIII. Varaždinska
XIX. Krapinsko-zagorska
XX. Zagrebačka
XXI. Grad Zagreb

Overview of TBE in Croatia

Table 1: Virus, vector, transmission of TBE in Croatia	
Viral subtypes, distribution	European subtype (TBEV-EU)[2,3]
Reservoir animals	Rodents
Infected tick species (%)	Information not available
Dairy product transmission	In 2015, a small outbreak of TBE affecting 7 people from the region of Bjelovar after consuming fresh goat's milk and cheeses.[5] In 2019, 5 patients were reported to have consumed raw goat milk from the same farm in the Gorski Kotar region.[6]

Table 2: TBE reporting and vaccine prevention in Croatia	
Mandatory TBE reporting	TBE has been an obligatory reportable disease in Croatia since 2007[1]
Other TBE surveillance	Not applicable
Special clinical features	Information not available
Available vaccines	FSME IMMUN[7]
Vaccination recommendations and reimbursement	Only recommended for residents in endemic areas and those visiting endemic areas (for recreation), as well as forestry workers in the Koprivnica-Križevci region[1]
Vaccine uptake by age group/ risk group/general population	Year / Number of vaccinated individuals in Zagreb[8] 2010 / 670 2011 / 678 2012 / 781 2013 / 577 2014 / 415
Name, address/website of TBE National Reference Center	National Institute of Public Health of Croatia https://www.hzjz.hr/en/

Figure 2: Burden of TBE in Croatia over time[8-9]



Source Data: Appendix—Figure 2

Age and gender distribution of TBE in Croatia: no available data

Appendix

Source data: Figure 2

Year	Number of cases	Incidence / 10^5
1991	60	1.4
1992	27	0.6
1993	76	1.8
1994	87	2.1
1995	59	1.4
1996	57	1.4
1997	25	0.6
1998	24	0.6
1999	26	0.6
2000	18	0.4
2001	27	0.6
2002	30	0.7
2003	36	0.9
2004	38	0.9
2005	28	0.7
2006	20	0.5
2007	11	0.3
2008	20	0.5
2009	44	1.1
2010	36	0.9
2011	26	0.6
2012	45	1.1
2013	44	1.1
2014	23	0.5
2015	25	0.6
2016	6	0.1
2017	10	0.2
2018	24	0.6
2019	14	0.3
2020	15	0.4
2021	4	0.1
2022	23	0.6

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