



TBE VACCINE EFFECTIVENESS IN THE BALTIC COUNTRIES

Background:

The Baltic states (Estonia, Latvia, and Lithuania) report some of the highest incidences of tick-borne encephalitis (TBE) in Europe (10–13 cases per 100,000 population). Vaccination is recommended for all residents aged ≥ 1 year; however, coverage remains suboptimal, with fewer than half of the population in each country completing the three-dose primary series.

Two vaccines are licensed in the region: FSME IMMUN (Pfizer) and Encepur (Bavarian Nordic). While the European subtype of TBE virus predominates, evidence suggests circulation of the Far Eastern and Siberian subtypes, with confirmed cases of Siberian-subtype TBE reported in Latvia.

To evaluate vaccine effectiveness (VE) and public health impact, an observational study was conducted in Estonia (1.37 million population), Latvia (1.88 million), and Lithuania (2.87 million). Vaccination histories of reported TBE cases were compared with those of general-population survey participants, using the case-cohort “screening method”.

Results:

Between 2019 and 2023, a total of 4,361 confirmed TBE cases were reported across the Baltic states. Estonia documented 583 cases, corresponding to an incidence of 8.8 per 100,000 population. Latvia reported 1,055 cases, with an incidence of 11.2 per 100,000, while Lithuania recorded the highest burden, with 2,723 cases and an incidence of 19.4 per 100,000. Overall, 87.2% of cases required hospitalization, and 0.8% of hospitalized patients died.

Vaccination history was available for 94.9% of the reported cases. Among these, 98.3% were unvaccinated, 1.4% (n=58) were partially vaccinated, and only 0.3% (n=13) were fully vaccinated. Within the partially vaccinated group, 56.9% had received fewer than three doses, while

the remainder had completed at least three doses but were overdue for their next booster.

From 2019 to 2023, a total of 89,656 individuals participated in population-based surveys. Vaccination history was available for 90.3% of respondents. Of these, 50.1% were unvaccinated and 49.9% had received at least one dose of a TBE vaccine. However, only 34.9% of participants provided exact vaccination dates. Among those with known vaccination schedules, 40% were fully vaccinated and 60% were partially vaccinated. Country-specific data indicated that 53.3% of respondents in Estonia, 38.7% in Latvia, and 59.3% in Lithuania remained unvaccinated.

The effectiveness of three on-schedule doses of TBE vaccine was estimated at 97.4% in Estonia, 99.0% in Latvia, and 99.6% in Lithuania. During the study period, vaccination prevented an estimated 3,520 TBE cases across the Baltic states—350 in Estonia, 1,620 in Latvia, and 1,550 in Lithuania. Modeling further suggested that if the entire population had been fully vaccinated between 2019 and 2023, approximately 7,817 cases could have been averted.

Discussion:

The study confirms that TBE vaccination is highly effective across all age groups in the Baltic states, with VE estimates consistent with findings from other European settings. Despite this, suboptimal vaccine uptake contributed to the continued high incidence of TBE.

Given the clinical severity of TBE, its public health burden, and the proven effectiveness of vaccination, the authors recommend consideration of government financial support to increase coverage in Estonia, Latvia, and Lithuania.



SIBERIAN SUBTYPE INFECTIONS OF TBE VIRUS IN LATVIA

Literature:

Angulo D, et al. Tick-borne encephalitis vaccine effectiveness and public health impact in the Baltic countries of Estonia, Latvia, and Lithuania, 2019–2023. *Int J Infect Dis Regions*. 2025; in press. doi:10.1016/j.ijregi.2025.100727.

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