



HIGH TBE VACCINATION EFFECTIVENESS IN SLOVENIA

Background:

Slovenia is a European country with about 2 million inhabitants living in 12 regions and has one of the highest TBE incidences in Europe (2.9 per 100,000 people in 2022). TBE vaccination is included in the national vaccination program. A survey of the general population in Slovenia reported that 39% of the population had received at least one dose of TBE vaccine. However, additional surveys indicated that TBE vaccine coverage may be less than 20%. Two TBE vaccines are marketed in Slovenia: Encepur (Bavarian Nordic) and FSME-IMMUN (Pfizer), the latter being used more widely. While various studies have shown that TBE vaccine effectiveness (VE) is about 95% in several European countries, no such data were available for Slovenia. Therefore, a study was conducted to estimate TBE vaccine effectiveness and the impact of TBE vaccination in Slovenia.

Results:

In an online household survey carried out from 2019 to 2024, participants were considered fully vaccinated if they had received at least 3 TBE vaccine doses and were not late in receiving the next dose in accordance with the vaccination schedule. Partial vaccination was defined as having received 1 or 2 injections or having received a late booster dose; these cases were examined in a sensitivity analysis.

From 2019 to 2024, the incidence of TBE was 5.1 per 100,000 population per year. Of 637 reported TBE cases, 62 (9.7%) were in the 1–15-year-old age group (incidence: 3.1 per 100,000), 357 (56.0%) were 16–59 years old (incidence: 5.1 per 100,000), and 218 (34.2%) were at least 60 years old (incidence: 6.3 per 100,000). Incidence rates varied across geographic regions (from 0.9 to 18.9 per 100,000). The regions with the highest TBE incidence were located adjacent to Austria in the north and Croatia in the south.

TBE vaccination history was available for 332 of the 637 surveillance-reported TBE patients.

Of these, 322 (97.0%) were unvaccinated and 10 (3.0%) had received at least one vaccine dose, including three with partially unknown dosing information. Six patients had received ≥ 3 doses, and two of them had received all doses in accordance with the recommended vaccination schedule. Overall, of the 332 cases with vaccination history, five cases were considered fully vaccinated in the base-case scenario and two cases were considered fully vaccinated in the sensitivity analysis.

Of 26,075 individuals analyzed in the general population survey, 86.8% provided information on their TBE vaccination history. Among these individuals, 57.9% were unvaccinated and 42.1% had received at least one vaccine dose. Of the 10,623 individuals who had received a TBE vaccine, 4,780 had a known number of vaccine doses and vaccination dates. Among them, 3,235 were partially vaccinated and 1,545 were fully vaccinated. The estimated TBE vaccine uptake in the general population of Slovenia was 57.9% unvaccinated, 28.5% partially vaccinated, and 13.6% fully vaccinated.

Under the base-case scenario, the estimated VE of ≥ 3 TBE vaccine doses was 93.4%, and under the sensitivity analysis scenario, VE was 97.4%.

The authors calculated that, in the absence of TBE vaccination, there would have been 1,064 TBE cases from 2019 to 2024. Compared with the 637 observed TBE cases, 426 cases were prevented in Slovenia over this period.

Discussion:

TBE vaccines were highly effective at preventing TBE and had a substantial impact on the burden of this disease in Slovenia. The high VE estimated for Slovenia was consistent with findings from other observational studies carried out in Austria, the Czech Republic, Estonia, Germany, Latvia, Lithuania, Sweden, and Switzerland.



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Despite the high TBE incidence in Slovenia and national recommendations for vaccination, this study showed that less than 50% of the general population had received at least one vaccine dose. Thus, further efforts are needed to increase awareness of TBE and TBE vaccination in Slovenia. Particularly noteworthy is the relatively high incidence of 3.1 per 100,000 in children and adolescents (1–15 years of age), indicating that vaccination should be started in childhood.

Literature:

Kordež et al. Tick-borne encephalitis vaccine effectiveness and impact in Slovenia, 2019–2024. *Pathogens*. 2026;15(5):503. doi:10.3390/pathogens15050503.

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