



IMPACT OF TBE VACCINATION IN AUSTRIA

Background:

Austria introduced a nationwide tick-borne encephalitis (TBE) vaccination program in the early 1980s, achieving coverage rates approaching 90% and a substantial reduction in TBE incidence. Despite the long-standing availability of TBE vaccines, incidence has increased in recent decades, with case numbers from 2018 to 2024 being the highest recorded in the past 30 years.

Two TBE vaccines are available in Austria: FSME-Immun and Encepur, each with adult and pediatric formulations. The standard vaccination schedule consists of three primary doses, followed by a booster dose after 3 years and subsequent boosters every 5 years for individuals younger than 60 years and every 3 years for those aged 60 years or older. Both vaccine brands also offer an accelerated schedule.

An Austrian research team recently analyzed the field effectiveness of TBE vaccination using 25 years of nationwide, hospital-based surveillance data, examining age-specific differences in clinical severity and vaccine protection.

Results:

Between 2000 and 2024, a total of 2438 hospitalized TBE cases were laboratory-confirmed at the Austrian national reference center. Data were available for 2260 patients (93% of all cases older than 1 year), of whom 84% were unvaccinated. Children (1–15 years) accounted for 12% of cases, adults aged 16–59 years for 47%, and adults aged ≥60 years for 41%.

Overall, 1051 cases (47%) were classified as severe, including 878 with encephalitis, 75 with encephalomyelitis, and 96 with radiculitis. There were 26 deaths: 2 among children, 3 among adults aged 16–59 years, and 21 among adults aged ≥60 years.

The overall vaccine effectiveness (VE) was

estimated at 97%, based on 1909 cases in unvaccinated and 351 cases in vaccinated individuals. VE was 94.3% in children, 97.4% in adults aged 16–59 years, and 96.5% in adults aged ≥60 years.

While 84.5% of cases occurred in unvaccinated individuals, 3.9% occurred in regularly vaccinated and 11.5% in irregularly vaccinated individuals. Among the irregularly vaccinated cases, 14.2% had received only one injection and 85.8% had received two or more doses. None of the patients had received an accelerated schedule. Even irregular vaccination was associated with effectiveness above 90%, including in older adults.

During 2000–2024, vaccination coverage declined from 85.4% to 80.7%, corresponding to a 32% relative increase in the proportion of unvaccinated individuals. Among unvaccinated individuals, the median TBE incidence increased from 4.3 per 100,000 (2000–2004) to 6.5 per 100,000 (2020–2024); the corresponding rates among vaccinated individuals were 0.02 per 100,000 and 0.09 per 100,000, respectively.

Modeling suggested that, in the absence of vaccination, approximately 10,389 hospitalizations (including 4517 severe cases and 90 deaths) would have occurred during 2000–2024.

Discussion:

Longitudinal analyses demonstrated that TBE vaccine effectiveness remained high among individuals vaccinated according to schedule and exceeded 90% even among those with irregular schedules. Field effectiveness was similarly high in older adults, who are at increased risk for severe TBE. This sustained protection likely reflects Austria's long-standing mass vaccination program, with many adults having initiated vaccination in early adulthood.



SIBERIAN SUBTYPE INFECTIONS OF TBE VIRUS IN LATVIA

TBE vaccination provided strong protection across all clinical outcomes. The predominance of severe cases among vaccinated patients may partly reflect under-detection of mild breakthrough infections in this hospital-based cohort.

Between 2000 and 2024, TBE vaccination in Austria is estimated to have prevented approximately 10,000 hospitalizations. Achieving full vaccination coverage could have prevented an additional 2100 cases, further reducing healthcare burden and associated costs. Maintaining high vaccination coverage and adherence to booster schedules remains essential to sustain high protection levels and minimize healthcare impact.

Literature:

Raffl M, et al. Tick-borne encephalitis: Burden of disease and impact of vaccination, Austria (2000–2024). *Vaccine*. 2025;43:127854. doi:10.1016/j.vaccine.2025.127854.

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