



TBE VACCINATION EFFECTIVENESS IN CHILDREN AND ADOLESCENTS, SWITZERLAND, 2005-2022

Background

In Switzerland, TBE vaccination has been recommended in risk areas for children aged 6 years and older (recently changed to 3 years, see [Snapshot Week 19/2024](#)) and is reimbursed by compulsory health insurance. Two TBE vaccines are licensed and available in Switzerland (FSME Immun and Encepur). These vaccines are generally considered interchangeable and induce long-term protective immunity after a series of three primary doses, with booster doses recommended every 10 years. For adults, a vaccine effectiveness (VE) of 95% has recently been reported in Switzerland after the complete vaccination of at least three doses, and a VE of 77% for those who received 1-2 doses. Data on VE in Swiss children and adolescents are limited. Therefore, a study was conducted to assess TBE vaccination coverage in children and adolescents, disease severity, and VE, along with estimates of disease risk among unvaccinated individuals and the number of cases prevented.

Results

Data for estimating vaccination coverage were based on surveys of more than 100,000 children and adolescents across Switzerland. The median age for the first vaccination was 7 years. Since the initial recommendation for TBE vaccination for individuals aged 6 years and older, vaccination progressively increased among those aged 8 to 16 years, with complete vaccination coverage rising from 4.8% in the 2005-2007 survey period to 48.7% in 2020-2022 for 8-year-olds, and from 6.6% in 2005-2007 to 50.1% in 2020-2022 for 16-year-olds. Vaccination coverage remained low among 2-year-olds (no recommendation) in the 2020-2022 survey. Of the 463 TBE cases included in the study, 296 were males, 100 were aged 0-5 years, 188 were aged 6-11 years, and 175 were

aged 12-17 years. Mild neurological disease was observed in 149 cases (34.9%), moderate disease in 209 cases (49%), and severe disease in 13 cases (3.0%). VE for incomplete vaccination was 66.2%, with a median time since the last vaccination of less than 1 year (range: 0-16 years). VE for complete vaccination was 90.8%, with a median time between the last vaccination and onset of illness of 5.5 years (range: 0-9 years). For complete vaccination within the past 5 years, VE was 93.4%, while VE for complete vaccination 5-10 years earlier was 83.9%. The number of TBE cases prevented by vaccination increased over time, with 41 cases prevented in the 2020-2022 survey period, and a total of 70 cases among children and adolescents aged 0-17 years between 2005 and 2022. During this period, an additional 312 TBE cases could potentially have been prevented if all individuals aged 0-17 years had been completely vaccinated. Incomplete vaccination did not result in breakthrough infections with a more severe disease course compared to unvaccinated individuals. By contrast, incomplete vaccination appeared to convey a reduced risk of neurological illness.

Discussion

These analyses revealed a high effectiveness of TBE vaccination in children and adolescents, even in those who were incompletely vaccinated. This is consistent with recent studies from Austria and Latvia (see [Newsletter September 2023](#)). The results are in line with previous findings in adults and support the continued effectiveness of TBE vaccination in children, even up to 10 years from the last dose received. This supports the 10-year booster interval in Switzerland (see [Newsletter June 2023](#)), compared to the 3-5 years recommended in most other countries.



Literature

Zens et al.

A combined cross-sectional analysis and case-control study evaluating tick-borne encephalitis vaccination coverage, disease and vaccine effectiveness in children and adolescents, Switzerland, 2005 to 2022. *Euro Surveill.* 2024;29(18):2300558. doi:10.2807/1560-7917.ES.2024.29.18.2300558

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