

Cost-Effectiveness analysis of Quadrivalent Versus trivalent Influenza Vaccination in Germany — Linking a Dynamic Transmission Model with Health and Economic Outcomes

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Objectives: Trivalent influenza vaccine (TIV) contains two Influenza A strains, but only one of the two B-lineages, resulting in frequent mismatches between vaccines and circulating B-lineages during seasonal epidemics. Quadrivalent influenza vaccine (QIV) prevents such mismatches by including both B-lineages. The objective of our study was to estimate the cost-effectiveness (CE) of QIV versus TIV in Germany by coupling influenza incidence generated by a dynamic individual-based simulation to health and economic outcomes.

Methods: An individual-based simulation tool (known in the literature as 4FLU) was refined to estimate the impact of TIV and QIV on clinical infection incidence per year and age over 20 calendar years in Germany. Cases were subsequently linked to health and economic outcomes. Inputs were gathered from national databases and published literature. Vaccination rates reflect the current coverage in Germany; 2014 was used as the baseline year for costs. The productivity costs (societal perspective) were calculated according to the human capital approach. Costs and effects were discounted at 3% and 1.5%, respectively. Univariate and probabilistic sensitivity analyses were performed.

Results: Per 100,000 inhabitants, QIV prevents 6,803 more clinical influenza cases and 6.45 more deaths than TIV, accumulated in 20 years. From the societal perspective, QIV dominates TIV, with € 1,424,323 of cost savings and 152 QALYs gained (98 QALYs by preventing clinical cases and 54 QALYs by avoiding premature mortality). These results are sensitive to changes in perspective, vaccination coverage, vaccine prices, productivity cost approach and discount rates, yet favorable CE remains. **Conclusions:** Based on our analysis, QIV is expected to be cost-effective, or even cost-saving in Germany. Our results are in line with findings from other studies using dynamic models and for other settings.