EE437

Evaluating the Cost-Effectiveness of High-Dose Influenza Vaccination for Adults Aged 60 Years and Older in Austria

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Key Takeaways

HD-IIV is cost effective over SD-IIV at €17,164 per QALY in Austria. It offers the greatest value during severe influenza seasons, thus supporting efficient allocation of healthcare resources.

OBJECTIVE

This study aimed to evaluate the public health impact and cost-effectiveness of the high dose-inactivated influenza vaccine (HD-IIV) compared with the standard dose-inactivated influenza vaccine (SD-IIV) among individuals aged ≥60 years in Austria using a health economic modelling approach.

CONCLUSIONS

This study shows that vaccination with HD-IIV for adults aged ≥60 years in Austria is likely to be a cost-effective strategy. The use of HD-IIV can significantly reduce the burden of influenza-related morbidity and mortality in the elderly population.

Policy makers should consider adopting HD-IIV for this age group to enhance protection and optimise the allocation of healthcare resources.

BACKGROUND

- Older adults are at elevated risk of complications from seasonal influenza, leading to increased healthcare resource utilisation and mortality.
- The HD-IIV offers improved protection in individuals aged ≥60 years compared with SD-IIV (1,2).

METHODS

- A static decision-tree model was developed to compare HD-IIV and SD-IIV in preventing influenza-related health outcomes among adults aged ≥60 years during one typical influenza season.
- The model incorporated Austrian data for demographics, epidemiology, and healthcare costs, while vaccine and quality of life-related inputs were extracted from international literature (**Table 1**).
- Vaccine efficacy was derived from randomised controlled trials, applying a 24.2% relative vaccine efficacy (rVE) for HD-IIV compared with SD-IIV (1).
- The cost-effectiveness analysis was conducted from a direct cost perspective over a one-season time horizon, incorporating quality-adjusted life years (QALY) as a measure of health benefits and estimating incremental cost-effectiveness ratios (ICERs).
- A scenario analysis assessed the impact of varying influenza severity, characterised by increased mortality, using an excess mortality range of 24 to 232 deaths per 100,000 population based on available Austrian data from the 2015–2016 to 2022–2023 seasons.
- Deterministic sensitivity analysis (DSA) was performed to assess the impact of variations in key input parameters (including rVE, utilities, epidemiological inputs, and treatment costs) on model results and to evaluate the robustness of the conclusions.

Table 1: Base case model inputs

Parameter	Age stratification (years)	Value	Source
Epidemiological inputs			
Influenza-related outpatient incidence rate (per 100,000)	60+	1,245.6	(3)
Influenza-related hospitalisation rate (per 100,000)	60–69	66.5	(4)
	70–79	142.6	
	80+	264.2	
Influenza-related excess mortality (per 100,000)	60+	115.9	(3)
Vaccination inputs			
Vaccination coverage rate (%)	60–69	12.8	(5)
	70–79	20.5	
	80+	24.3	
SD-IIV efficacy (%)	60+	58.0	(6)
HD-IIV relative efficacy (%)	60+	24.2	(1)
Quality of life inputs			
Utility population norms (German values as proxy)	60–64	0.922	(7)
	65–74	0.891	
	75+	0.839	
Average utility per day of mean duration of influenza	60+	0.223	(8)
Additional QALY loss per hospital stay	60+	0.018	(9)
Cost inputs			
Vaccine costs for SD-IIV (€)	60+	11.50	(10)
Vaccine costs for HD-IIV (€)		32.00	
Vaccine administration costs (€)	60+	15.00	(11)
Costs for Influenza-related General Practitioner (GP) visits (€)	60+	23.78	(12)
Hospitalisation costs per Influenza episode (€)	60+	2363.00	(12)

RESULTS

- The model estimates that replacing SD-IIV with HD-IIV in the ≥60 years age group would prevent 568 outpatient visits, 89 hospitalisations, and 57 influenza-related deaths per season (**Figure 1**).
- With incremental costs of €8,928,947 and 520 incremental QALYs, the base case ICER was €17,164 per QALY gained (**Table 2**).
- The ICER varied substantially depending on the level of observed influenza-related excess mortality used as model input (**Table 3**). Seasons with higher excess mortality, such as 2016–2017 and 2017–2018, were related with a significantly improved cost-effectiveness of the intervention, as reflected by notably lower ICERs under more severe influenza conditions.
- The DSA indicated that parameters related to mortality (i.e., mortality rate, discount rate, and rVE) had substantial influence on the ICER, whereas variations in health state utility values, treatment costs, and hospitalisation rates had minimal impact (**Figure 2**).

Figure 1: Public health impact of HD-IIV vs. SD-IIV among adults aged ≥60 years in Austria during one influenza season

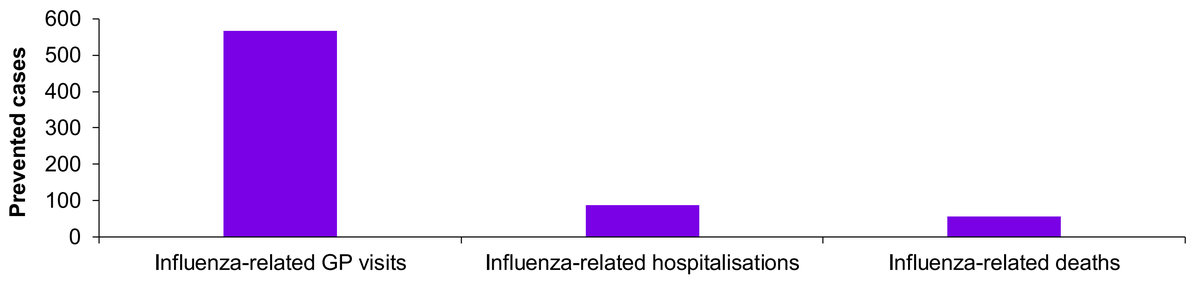
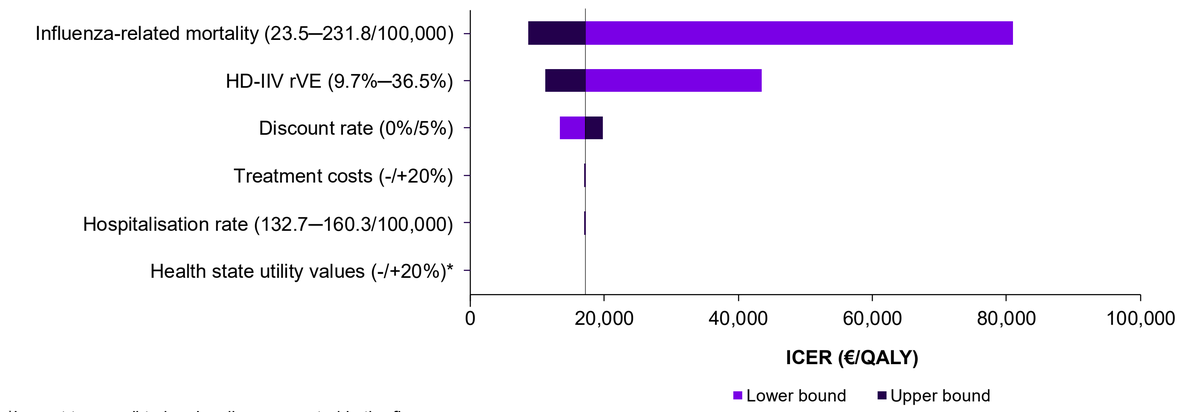


Figure 2: Impact of key parameters on cost-effectiveness in a deterministic sensitivity analysis



*Impact too small to be visually represented in the figure.

Table 2: Base case cost-effectiveness of HD-IIV vs. SD-IIV for adults aged 60+ years in Austria during one influenza season

	SD-IIV	HD-IIV	Incremental
Total costs (€)	21,671,589	30,600,536	8,928,947
Vaccination costs	11,841,398	21,001,724	9,160,326
Treatment costs	9,830,191	9,598,812	-231,379
QALYs lost	25,082,847	25,083,368	520
ICER			**17,164**

Table 3: Scenario analysis of ICERs by influenza-related mortality across influenza seasons (2015–2016 to 2022–2023)

Influenza season	Influenza-related mortality (1) (per 100,000 persons)	ICER (€/QALY)
2015–2016	23.5	80,777
2016–2017	231.8	8,632
2017–2018	197.0	10,145
2018–2019	91.4	21,693
2019–2020	75.9	26,061
2020–2021	no influenza circulation	-
2021–2022	27.7	69,198
2022–2023	166.7	11,976

ABBREVIATIONS: DSA, Deterministic sensitivity analysis; €, Euros; GP, General practitioner; HD-IIV, high-dose inactivated influenza vaccine; ICER, incremental cost-effectiveness ratio; QALYs, quality-adjusted life years; rVE, relative vaccine efficacy; SD-IIV, standard-dose inactivated influenza vaccine.

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