Estimation of the Public Health and Economic Impact of RSVPreF3 OA on Older Adults in Germany

Strong reductions in morbidity, mortality, and healthcare system burden can be achieved by recommending adjuvanted **RSVPreF3** vaccination for all individuals aged 60 years and above, as well as for those aged 50-59 years who are at increased risk.

Digital poster
Supplemental data

SCAN ME

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Background

- STIKO recommends vaccination against RSV for individuals 60-74 YOA at increased risk for severe RSV infection and all individuals ≥75 YOA[1].
- The indication of the adjuvanted RSVPreF3 vaccine targeting RSV has been expanded in August 2024 to individuals 50-59 YOA at increased risk[2].
- New data on adjuvanted RSVPreF3 efficacy over three RSV seasons have been recently presented[3].

Aims

To **analyze** the potential **public health impact (PHI)** and **cost-effectiveness** of the current recommendation for vaccination with adjuvanted RSVPreF3 and extended populations in Germany.

Study design

Multi-cohort Markov model[4] for medically attended cases

Age group cohorts: 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, ≥80 YOA
Time horizon: 5 years
Cycle length: 1 month
Annual incidence: 3,03% (Average over 6 seasons: 2013/14 – 2018/19[5])
Perspective: Societal

Under-ascertainment factor: 2.19[6]

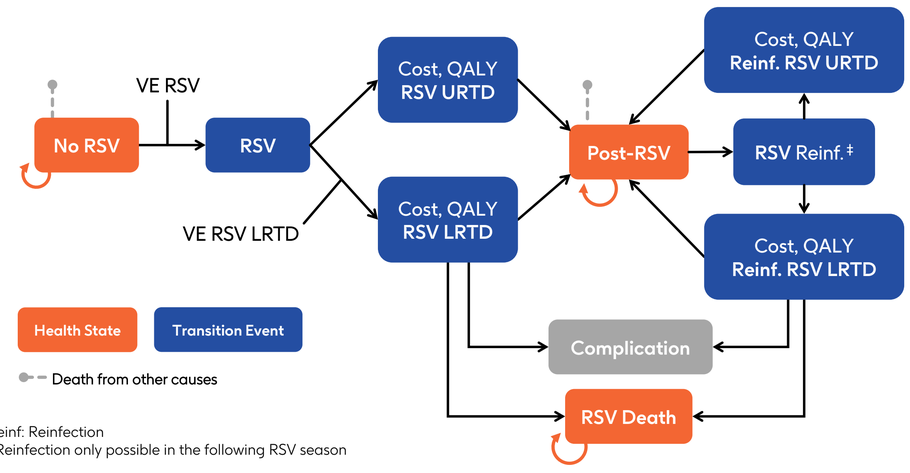
HCRU, complications, direct and indirect costs: Claims data analysis (4.5M individuals)

- RSV possible cohort: RSV diagnoses + non-specific respiratory tract infections
- At increased risk: Patients with underlying conditions and immunocompromised patients[7,8,9]

[*Wider definition than the current STIKO recommendation*]

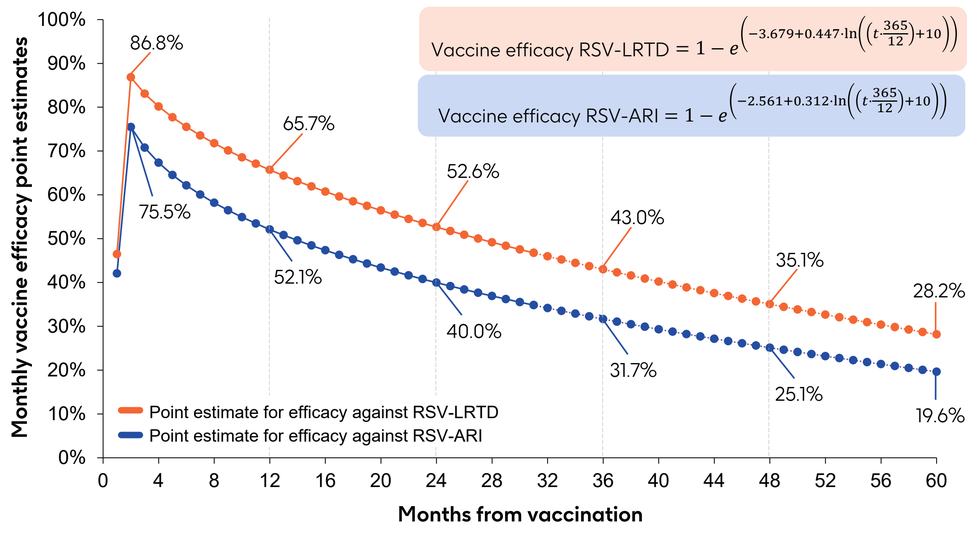
One-time vaccination†
Vaccination coverage[10]:
50-59 YOA: 24%
60-74 YOA: 43%
≥ 75 YOA: 53%
† Vaccination month: September

Sensitivity analysis: Probabilistic sensitivity analysis (1,000 Iterations)
Revaccination schedule is still to be determined.

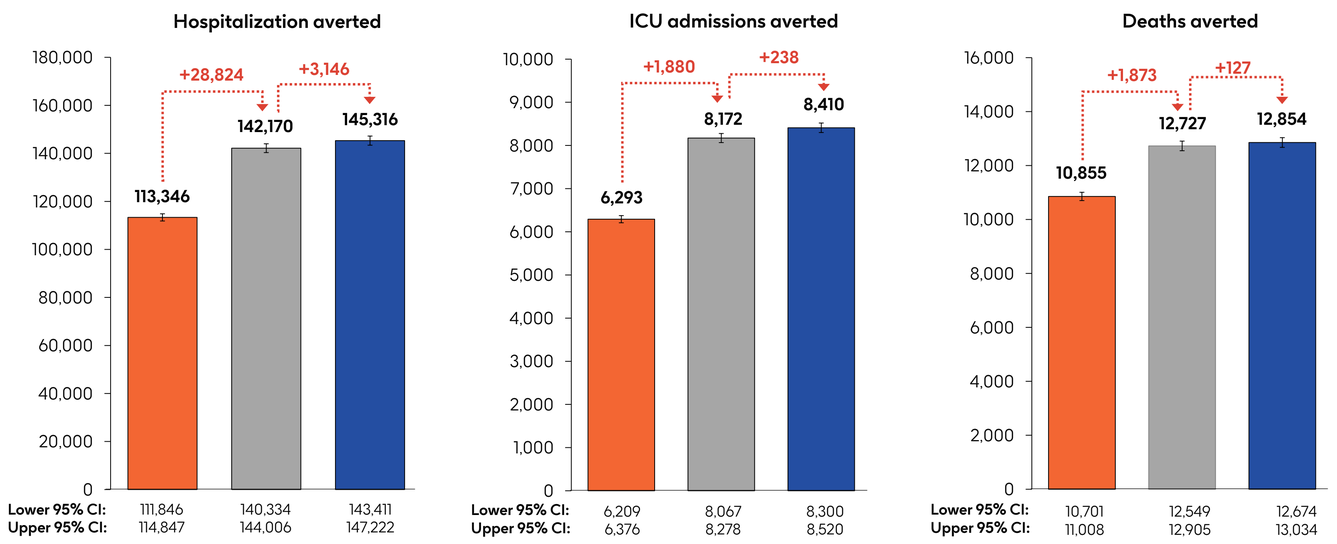


Reinf: Reinfection
‡ Reinfection only possible in the following RSV season

Vaccine efficacy (VE) is estimated using multivariable regression modeling



Results



NNV	60-74 YOA at increased risk and ≥75 YOA	≥60 YOA general population	50-59 YOA at increased risk and ≥60 YOA
Hospitalizations	66	82	84
ICU	1,187	1,432	1,449
Deaths	688	919	948

Prevented cases over 5 years

Vaccination recommendations for a broader age range (including individuals 50-59 at risk and 60+ all) **would lead to a lower PHI impact of RSV, with higher but still acceptable cost-effectiveness values.**

Conclusions

Taking into account the recently presented topline results, with a median follow up of efficacy over 30.6 months, adjuvanted RSVPreF3 is cost-effective in all scenarios.

Expanding recommendations to include individuals aged 50–59, in line with the current indication for adjuvanted RSVPreF3, and those aged 60 and above, helps prevent additional public health burden compared to the current recommendation.

Abbreviations

PHI: Public Health Impact, QALY: Quality Adjusted Life Year, RSV: Respiratory Syncytial Virus, STIKO: The Standing Committee On Vaccination, URTD: Upper Respiratory Tract Disease, LRTD: Lower Respiratory Tract Disease, CI: confidence interval, M: millions, Reinf: Reinfection, NNV: Number Needed to Vaccinate, YOA: Years of Age, HCRU: Healthcare Resource Utilization, VE: Vaccine Efficacy, ARI: Acute Respiratory Infections, ICU: Intensive Care Unit, ICER: Incremental Cost Effectiveness Ratio

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Acknowledgements

The authors would like to thank Frederik Verelst for his participation in the study. Business & Decision Life Sciences Medical Communication Service Center provided editorial assistance and publication coordination, on behalf of GSK (writer: Malack Abbas).

Disclosures

MW, PM, EZ, SP, DM and AM are employed by GSK. AM and EZ also hold financial equities in GSK. The authors declare no other financial and non-financial relationships and activities.
Funding: GSK (VEO-000578)

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Main input parameters used for the model adaptation: Health care resource utilization, complications and costs.

			Health care resource utilization					Complications				QALY loss	
Age Group (years)	Population size (N)[1,2]	Proportion of LRTD[3]	GP visits – URTD (N)[4]	GP visits – LRTD (N)[4]	Hospitalization, given LRTD[5,•]	ICU admission [4,•]	Death [4,•]	Pneumonia [4,‡]	ARDS [4]	COPD exacerbation [4,6]	Asthma exacerbation [4,6]	URTD [3,7]	LRTD [3,7,◊]
General population (with and without risk factors)													
50-59 YOA	12,362,643	60.38%	1.18	1.68	9.20%	6.17%	0.58%	11.77%	1.93%	26.62%	3.80%	0.0024	0.0070
60-74 YOA	16,000,773	60.38%	1.06	1.63	18.75%	7.09%	1.73%	20.83%	5.61%	29.19%	4.10%	0.0024	0.0075
≥75 YOA	9,280,433	60.38%	1.13	1.85	42.52%	5.00%	6.00%	38.17%	12.90%	31.14%	6.14%	0.0024	0.0087
At -increased risk population													
50-59 YOA	2,001,546	60.38%	1.04	1.62	14.74%	7.48%	0.59%	14.95%	3.20%	26.75%	3.81%	0.0024	0.0073
60-74 YOA	4,821,257	60.38%	1.00	1.57	26.48%	7.54%	1.84%	24.98%	7.48%	29.22%	4.18%	0.0024	0.0079
≥75 YOA	5,004,970	60.38%	1.10	1.81	48.03%	6.04%	6.21%	44.75%	16.47%	31.27%	6.25%	0.0024	0.0090

		Direct costs			Indirect costs				Out of pocket costs	
Age Group (years)	Population size (N)[1,2]	URTD – Outpatient[4]	LRTD – Outpatient[4]	LRTD – Inpatient[4]	URTD – Outpatient [2,4,8]	LRTD – Outpatient [2,4,8]	LRTD – Inpatient [2,4,8,]	LRTD – Death [2,4,8,†]	URTD[3]	LRTD[3,◊]
General population (with and without risk factors)										
50-59 YOA	12,362,643	57.85 €	83.83 €	3,807.34 €	371.39 €	396.68 €	983.70 €	8,991.29 €	9.53 €	23.20 €
60-74 YOA	16,000,773	79.42 €	97.86 €	4,191.96 €	229.63 €	223.03 €	454.47 €	3,535.27 €	9.53 €	33.37 €
≥75 YOA	9,280,433	98.43 €	104.37 €	4,231.32 €	0.00 €	0.00 €	0.00 €	0.00 €	9.53 €	59.14 €
At -increased risk population										
50-59 YOA	2,001,546	57.79 €	85.16 €	4,102.06 €	366.77 €	381.22 €	1,039.80 €	8,758.09 €	9.53 €	28.35 €
60-74 YOA	4,821,257	86.96 €	97.78 €	4,282.37 €	139.61 €	126.90 €	407.49 €	3,034.23 €	9.53 €	41.29 €
≥75 YOA	5,004,970	105.88 €	103.90 €	4,305.88 €	0.00 €	0.00 €	0.00 €	0.00 €	9.53 €	65.81 €

† Friction cost approach; ◊ Weighted average in- and outpatients; • Assumption: Only LRTD cases are admitted to the hospital or die.

Abbreviations

ARDS: Acute Respiratory Distress Syndrome, COPD: Chronic Obstructive Pulmonary Disease, GP: General Practitioner, ICU: Intensive Care Unit, LRTD: Lower Respiratory Tract Disease, URTD: Upper Respiratory Tract Disease. QALY: Quality, Adjusted Life Year, N: number, YOA: Years of Age

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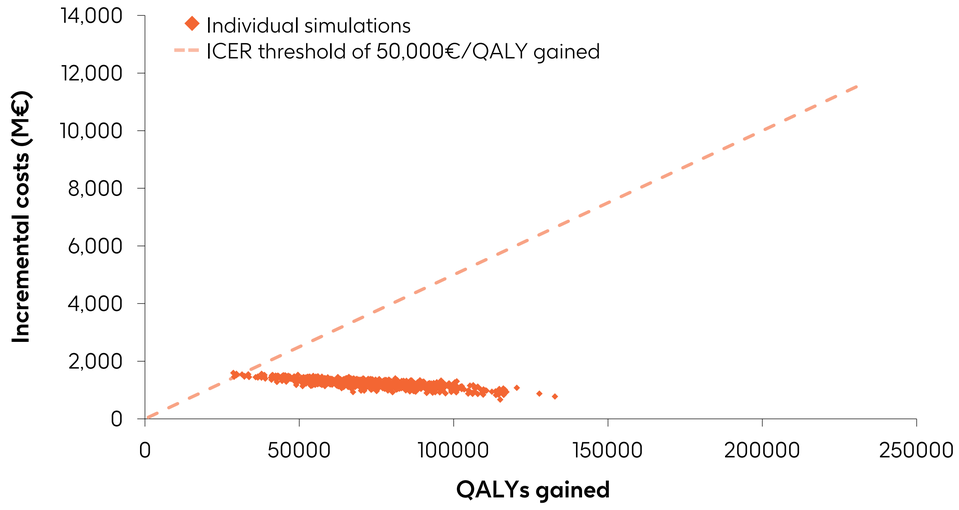
Public Health and Economic Impact of adjuvanted RSVPreF3 vaccination over 5 years

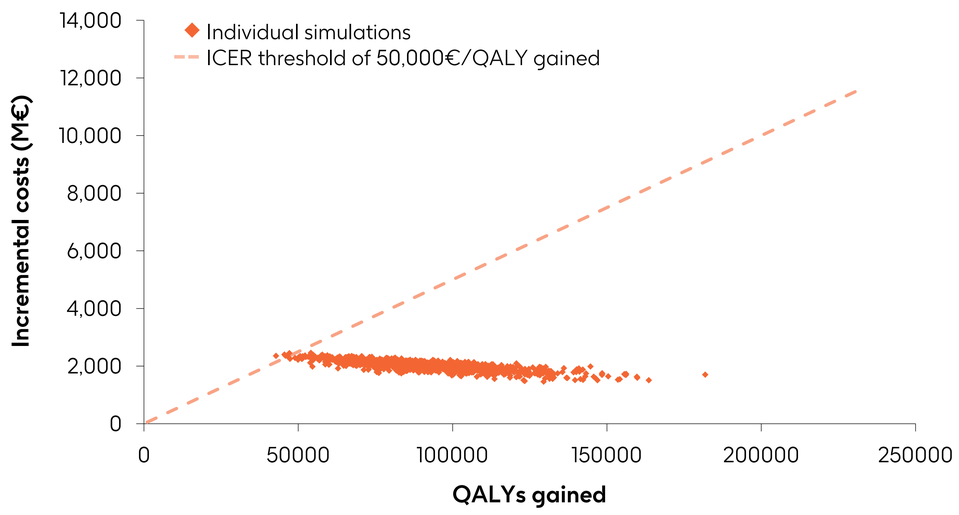
60-74 YOA at increased risk and ≥75 YOA	No vaccination	With adjuvanted RSVPreF3	Prevented cases	NNV
N	16,103,236	16,103,236		
N (with one shot of adjuvanted RSVPreF3)		7,471,102		
Public health impact/Health care resource utilization				
RSV URTD	884,371	798,381	85,990	87
RSV LRTD	1,347,613	1,035,383	312,231	24
RSV ARI	2,231,985	1,833,764	398,221	19
GP visits	3,286,256	2,645,631	640,625	12
Hospitalizations•	459,870	346,523	113,346	66
ICU admissions	26,399	20,106	6,293	1,187
Deaths◊	42,524	31,670	10,855	688
Complications				
Pneumonia	156,851	116,754	40,097	186
ARDS	51,568	38,254	13,315	561
COPD	56,893	44,138	12,755	73
Asthma	5,883	4,544	1,339	426
Economic impact				
QALY losses (discounted @ 3%)	295,576	221,216	74,361	
Total costs (discounted @ 3%)	2,722,756,273 €	3,942,242,622 €	1,219,486,349 €	
ICER	16,400 €			

Incremental cost-effectiveness plane of adjuvanted RSVPreF3 vaccine vs. No Vaccination in age group 60 – 74 YOA AIR and ≥75 YOA



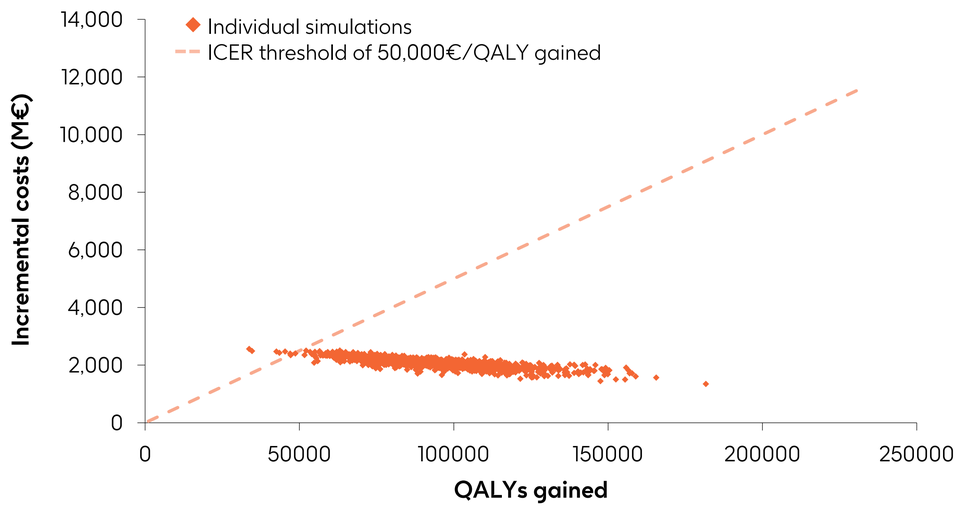
≥60 YOA general population	No vaccination	With adjuvanted RSVPreF3	Prevented cases	NNV
N	25,281,206	25,281,206		
N (with one shot of adjuvanted RSVPreF3)		11,701,934		
Public health impact/Health care resource utilization				
RSV URTD	1,410,289	1,273,943	136,347	86
RSV LRTD	2,149,012	1,651,819	497,194	24
RSV ARI	3,559,302	2,925,761	633,540	18
GP visits	5,191,318	4,190,962	1,000,356	12
Hospitalizations•	578,905	436,735	142,170	82
ICU admissions	34,068	25,896	8,172	1,432
Deaths◊	50,332	37,605	12,727	919
Complications				
Pneumonia	179,779	134,064	45,715	256
ARDS	57,321	42,589	14,732	794
COPD	53,360	40,642	12,718	78
Asthma	7,031	5,373	1,659	486
Economic impact				
QALY losses (discounted @ 3%)	379,602	284,611	94,991	
Total costs (discounted @ 3%)	3,896,399,395 €	5,881,130,656 €	1,984,731,261 €	
ICER	20,894 €			

Incremental cost-effectiveness plane of adjuvanted RSVPreF3 vaccine vs. No Vaccination in age group ≥60 YOA



50-59 YOA at increased risk and ≥60 YOA	No vaccination	With adjuvanted RSVPreF3	Prevented cases	NNV
N	27,282,752	27,282,752		
N (with one shot of adjuvanted RSVPreF3)		12,184,306		
Public health impact/Health care resource utilization				
RSV URTD	1,527,787	1,385,608	142,180	86
RSV LRTD	2,328,057	1,809,512	518,545	23
RSV ARI	3,855,844	3,195,120	660,725	18
GP visits	5,603,406	4,562,376	1,041,029	12
Hospitalizations•	605,285	459,969	145,316	84
ICU admissions	36,064	27,653	8,410	1,449
Deaths◊	51,396	38,542	12,854	948
Complications				
Pneumonia	183,767	137,576	46,191	264
ARDS	58,183	43,348	14,835	821
COPD	58,724	45,366	13,358	79
Asthma	7,869	6,110	1,759	492
Economic impact				
QALY losses (discounted @ 3%)	397,096	299,994	97,101	
Total costs (discounted @ 3%)	4,369,400,349 €	6,418,001,863 €	2,048,601,515 €	
ICER	21,098 €			

Incremental cost-effectiveness plane of adjuvanted RSVPreF3 vaccine vs. No vaccination in age group 50-59 YOA AIR and ≥ 60 YOA general population



• Assumption: Only LRTD cases can be hospitalized
◊ In-hospital mortality

Abbreviations

ARDS: Acute Respiratory Distress Syndrome, CHF: Congestive Heart Failure, COPD: Chronic Obstructive Pulmonary Disease, GP: General Practitioner, ICU: Intensive Care Unit, LRTD: Lower Respiratory Tract Disease, URTD: Upper Respiratory Tract Disease, QALY: Quality Adjusted Life Year, RSV: Respiratory Syncytial Virus, ICER: Incremental cost effectiveness ratio, NNV: number needed to vaccinate, M: millions, YOA: Years of Age, N: number, OA: older adults, ARI: Acute Respiratory Infections, AIR: at Increased Risk

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