EE601

Cost-Effectiveness of Strategies to Prevent Respiratory Syncytial Virus Hospitalization Among Infants in Austria

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INTRODUCTION

- Respiratory syncytial virus (RSV) is a major cause of lower respiratory tract disease (LRTD) and hospitalization during infancy, with the highest risk concentrated in the first months of life[1]
- In Austria, administration of either nirsevimab for infants or RSV prefusion F protein-based vaccination (RSVpreF) for pregnant women whose expected delivery date is between October and March is recommended to prevent RSV-LRTD[2]
- However, at present, only nirsevimab is included in the Austrian national immunization program[2]
- A complementary strategy combining maternal RSVpreF vaccination with nirsevimab for infants not protected through maternal vaccination may effectively prevent infant RSV morbidity while using fewer nirsevimab doses thereby reducing costs

OBJECTIVE

- **To evaluate the cost-effectiveness of maternal RSVpreF vaccination complemented by nirsevimab for infants not protected by maternal vaccination *versus* nirsevimab only for infants in Austria**

METHODS

Model Description

- A cohort model evaluated the clinical and economic outcomes of RSV-LRTD hospitalization (RSV-H) among infants aged <1 year and the effects of alternative immunization strategies
- An annual birth cohort entered the model in monthly rolling cohorts and was followed through the first year of life; the lifetime effects of premature RSV-related death were also captured
- Model outcomes included RSV-H, RSV-related deaths, life-years, quality-adjusted life-years (QALYs), caregiver QALY loss, medical costs, intervention costs, total costs, and incremental cost-effectiveness

Estimation of Base Case Model Inputs

- Model population included 76,437 pregnant women and approximately 77,235 live births, based on 2024 Austrian national data[3]:
  - Infants were further characterized by gestational age in weeks (wGA) at birth (i.e., full term [≥37 wGA], late preterm [32-<37 wGA], early preterm [28-<32 wGA], or extreme preterm [<28 wGA])
- RSV-H incidence (Table 1) was based on average incidence of hospitalizations with an RSV-specific ICD-10 code (J12.1, J20.5, J21.0) as the primary diagnosis among Austrian infants aged <1 year from 2017-2024 (excluding 2020/2021 season)[4]:
  - Incidence was stratified by single month of chronological age[1,5], term status[6], and the distribution across calendar months based on pre-COVID-19 data from 2017-2019[4] (Table 2)
- Age-specific case-fatality rates per 100 cases of RSV-H (age <6m: 0.05; age 6-<12m: 0.1) were based on published rates for high-income countries[7] and assumed invariant by term status
- Age-specific general infant mortality was estimated from 2025 Austrian national data[8] and allocated by term status[9]
- Baseline infant health state utility was assumed 1; annual utility decrement due to RSV was 0.0157[10] for infants and 0.0066 for their caregivers[11]

METHODS (continued)

Estimation of Base Case Model Inputs (cont.)

- Initial effectiveness of RSVpreF and nirsevimab[12] was based on recently published real-world evidence; protection was assumed to remain constant through month 3 and then wane thereafter[13] (Figure 1):
  - Infants born <2 weeks after maternal vaccination were conservatively assumed to receive no RSVpreF protection; nirsevimab protection was assumed to begin 1 week after administration
- RSVpreF (€165) and nirsevimab (€350) prices were based on list price[14]; administration cost of €15.78 was applied to both interventions[15]
- Cost of infant RSV-H was €14,959[1,16]

Table 1. Incidence of RSV-H by term status

	Term Status		
Age	Full Term	Late Preterm	Early/Extreme Preterm
<1 month	20.8	36.2	9.8
1 to <2 months	36.7	63.9	17.3
2 to <3 months	26.3	45.8	12.4
3 to <4 months	18.2	44.9	43.2
4 to <5 months	15.9	39.2	37.7
5 to <6 months	12.7	31.4	30.2
6 to <7 months	22.6	38.6	154.3
7 to <8 months	18.8	32.2	128.5
8 to <9 months	17.2	29.3	117.3
9 to <10 months	19.8	33.8	135.0
10 to <11 months	14.1	24.1	96.4
11 to <12 months	14.1	24.1	96.4

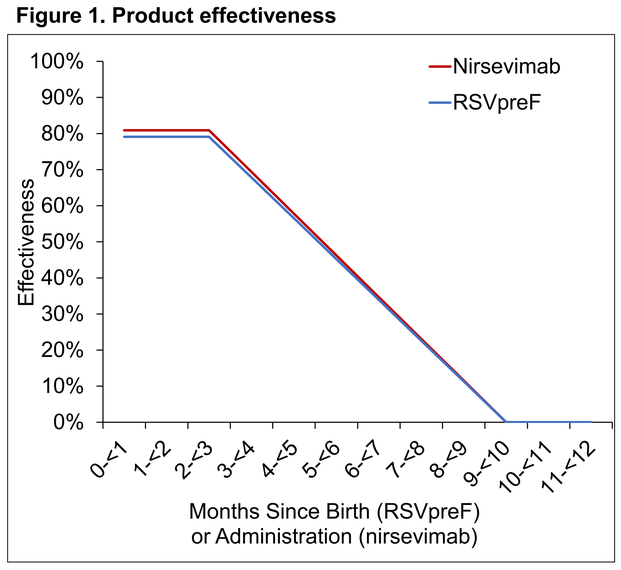
Table 2. Distribution of RSV-H cases by calendar month

Month	Proportion of Cases
January	22.3%
February	39.2%
March	23.2%
April	7.2%
May	1.3%
June	0.3%
July	0.1%
August	0.0%
September	0.1%
October	0.2%
November	1.0%
December	5.0%

Analyses:

- In base case analyses, complementary strategy included 30% uptake of RSVpreF among eligible pregnant women and 80% uptake of nirsevimab among infants not protected by maternal vaccination and the nirsevimab-alone strategy assumed 80% uptake among all infants:
  - Base case analyses also modeled no intervention for purposes of contextualization of results
- Scenario analyses evaluated maternal benefits of RSVpreF, reductions in RSV-related sequelae, and alternative assumptions for uptake of interventions
- Costs and health outcomes were discounted at 3% annually; all costs were in 2025 euros
- Cost-effectiveness was assessed from the healthcare system perspective as the incremental cost per QALY gained and incremental cost per RSV-H averted

Figure 1. Product effectiveness



RESULTS

Base Case Analyses

- With no intervention, there were 1,632 RSV-H events; total medical care costs for RSV-H were €23.8 million (Table 3)
- Under the complementary strategy, 63,828 infants were protected compared to 61,648 infants in the nirsevimab alone strategy
- With savings attributable to fewer hospitalizations and lower total cost of immunization, the complementary strategy saved €50,225 per hospitalization averted compared with nirsevimab alone.

Scenario Analyses

- Maternal benefit: RSVpreF prevented 10 hospitalizations among women who received maternal RSVpreF as part of the complementary strategy, averting €80,000 in costs (Table 4)
- Sequelae: with the complementary strategy, there were 38 fewer sequelae-related hospitalizations and 23 fewer outpatient encounters, resulting in savings of approximately €0.6 million versus current program (Figure 2)
- Higher RSVpreF uptake: increasing RSVpreF uptake to 60% doubled the number of RSV-H averted (vs. nirsevimab alone)

Table 3. Cost-effectiveness of intervention strategies to protect infants in Austria against RSV -- Base Case

		With Intervention		
	No Intervention	Nirsevimab Alone	Complementary	Difference
Population				
No. pregnant women	76,437	76,437	76,437	---
No. live births	77,235	77,235	77,235	---
Use of interventions				
No. pregnant women receiving RSVpreF	---	---	11,069	11,069
No. infants protected via RSVpreF	---	---	10,895	10,895
No. infants receiving nirsevimab	---	61,648	52,933	-8,715
Clinical outcomes				
No. RSV hospitalizations	1,632	842	809	-33
No. of RSV-related deaths	1	1	1	0
QALYs (discounted)	2,305,777	2,305,811	2,305,812	1
Economic outcomes (in millions)				
Medical care (inpatient only)	€ 23.8	€ 12.3	€ 11.8	-€ 0.5
Intervention	---	€ 22.1	€ 21.0	-€ 1.2
RSVpreF	---	---	€ 2.0	€ 2.0
Nirsevimab	---	€ 22.1	€ 19.0	-€ 3.2
Medical + intervention	€ 23.8	€ 34.4	€ 32.7	-€ 1.6
Cost-effectiveness				
Cost per QALY	**---**	**---**	**---**	**Dominant**
Savings per hospitalization averted	**---**	**---**	**---**	**€ 50,225.1**

Figure 2. Cases and costs of sequelae following RSV-H

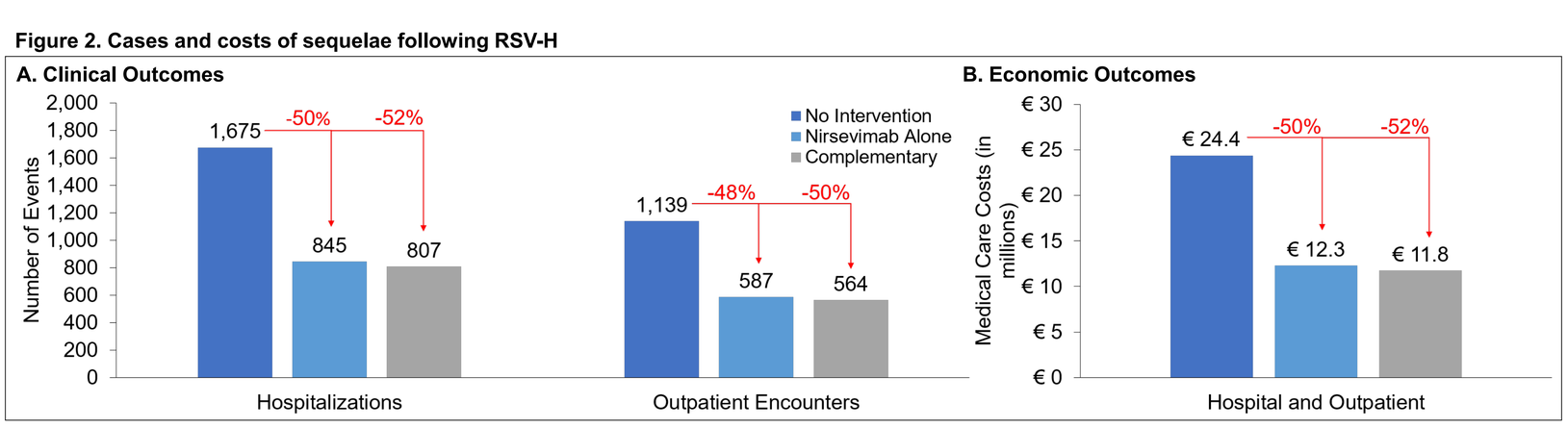


Table 4. Differential results from scenario analyses (complementary strategy vs. nirsevimab alone)

	Scenario		
	Sequelae	Maternal Benefit	60% RSVpreF Uptake
Infant RSV-H prevented	33	33	65
Other hospitalizations prevented*	38	10	---
Outpatient encounters prevented†	23	---	---
Reduction in total cost, millions	**€ 2.2**	**€ 1.7**	**€ 3.3**
Savings per infant RSV hospitalization averted	**€ 67,068.9**	**€ 52,675.1**	**€ 50,316.0**

*Sequelae or maternal benefit-related, scenario dependent
†Sequelae-related

LIMITATIONS

- Austrian data were used where available; evidence from other high-income settings informed parameters for which Austrian estimates were unavailable
- RSV incidence was averaged across multiple seasons and excluded the atypical 2020–2021 season; future season timing and intensity may differ
- Case-fatality rates were assumed not to vary by gestational age because sufficiently detailed evidence to support alternative assumptions is unavailable
- Product effectiveness and waning assumptions were informed by available follow-up data
- Infants born within 2 weeks after maternal RSVpreF administration were assumed to receive no protection, which may underestimate partial benefit[17]
- The impact of RSVpreF and nirsevimab on RSV-related Sequelae was modeled assuming a causal relationship between infant RSV-H and subsequent respiratory morbidity in preschool-aged children; however, the extent to which this association reflects causality rather than underlying susceptibility remains uncertain

CONCLUSIONS

- **An RSV immunization strategy comprising maternal RSVpreF with nirsevimab for infants not protected via maternal vaccination increases the number of infants protected against RSV, thereby further decreasing RSV-H in infancy, while being less costly**
- **Maternal RSVpreF uptake may provide additional benefit by preventing rare, but potentially severe cases of RSV requiring hospitalization among women of reproductive age**
- **Reducing RSV-H in infants may in turn provide additional health and economic benefits by reducing risk of RSV-H-related sequelae**
- **Targeted implementation strategies would be needed to achieve the modeled uptake of maternal RSVpreF vaccination in Austria**

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