

# Evaluating the Cost-Effectiveness of RSV Vaccination for the Elderly in the Netherlands: A Promising Public Health Strategy

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## BACKGROUND

- Respiratory syncytial virus (RSV) can cause significant, and often severe respiratory infections, particularly affecting older adults and individuals with underlying health conditions
- RSV vaccines for adults aged ≥60 years have been available since 2023 and have provided sustained efficacy in clinical trials against both RSV-associated acute respiratory disease (ARD) and lower respiratory tract disease (LRTD)<sup>1-4</sup>
- In 2024, the Dutch Health Council will advise the Ministry of Health on a public immunization programme for RSV; one of the assessment criteria is that the intervention should be cost-effective

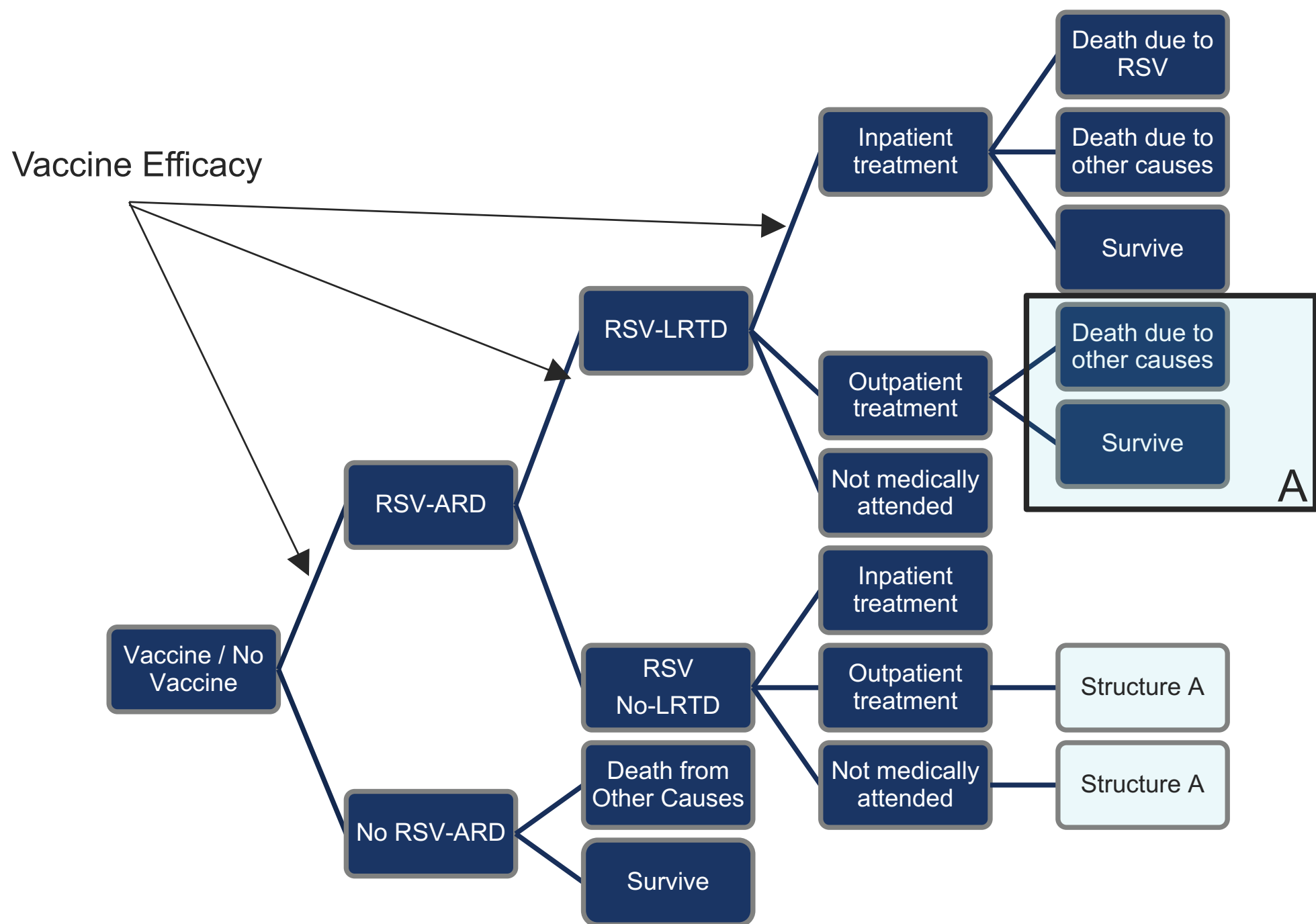
## OBJECTIVE

- This study aimed to assess the cost-effectiveness of a public RSV vaccination programme in the Netherlands for individuals aged ≥60 years with a single dose of an RSV vaccine

## METHODS

- A static health-economic model (**Figure 1**) was used to reflect the current situation in the Netherlands, specifically tailored to account for the local RSV epidemiology and healthcare system (see poster EPH176)
- Vaccine efficacy (VE) inputs were derived from the ConquerRSV study, the pivotal efficacy trial of the mRNA-1345 vaccine<sup>5</sup>
- Data from an extended analysis, with a median of 18.8 months follow-up, were used to linearly project the duration of vaccine protection over time (**Figure 2**)<sup>6,7</sup>
  - With this approach, vaccine protection was projected to wane to 0% at around 3 years
- Economic and utility input parameters were extracted from the literature and are shown in **Table 1**
- For the vaccine price, we applied the highest currently available RSV vaccine list price for the Netherlands and assumed an administration fee of €14 based on flu vaccination costs
- Cost-effectiveness was calculated from a societal perspective according to Dutch guidelines, including discount rates for costs and utilities at 4% and 1.5%
- The robustness of the model-predicted outcomes was assessed in a sensitivity analysis, in particular, the impact of underreporting was assessed<sup>8,9</sup>
  - The epidemiologic input numbers do not or only partly account for variations in diagnostic testing; together, with low disease awareness and lack of routine testing, this has led to underreporting of the full burden of disease.<sup>8,9</sup> Therefore, in sensitivity analyses, disease burden was adjusted by increasing the hospitalization rate 2.2-fold<sup>9</sup>

Figure 1. Model Structure



ARD, acute respiratory disease; LRTD, lower respiratory tract disease; RSV, respiratory syncytial virus.

Table 1. Model Parameters

Parameter	Value
<b>Direct medical costs</b>	
Inpatient treatment	€7173-8029 <sup>10</sup>
Outpatient treatment	€71 <sup>11</sup>
No treatment	€3.64 <sup>11</sup>
<b>Indirect costs</b>	
Labor participation	10-68% (Dutch statistics)
Productivity costs	€39.88/hour (Dutch statistics)
Hours per day	6.62 (Dutch statistics)
Days of work lost	7–19 <sup>12</sup>
<b>Vaccination costs</b>	
Vaccine price	€191/vaccine
Administration costs	€14
<b>QALY lost per patient</b>	
Inpatient treatment	0.0193 <sup>13</sup>
Outpatient treatment	0.0185 <sup>13</sup>
No treatment	0.0093 (assumed)

QALY, quality-adjusted life-year.

## RESULTS

### Economic Outcomes

- In adults aged ≥60 years, the total RSV-related costs without a vaccination programme were estimated at €423,819,521 during a 3-year time horizon
- Total direct costs of a public RSV vaccination programme in adults aged ≥60 years were estimated at €589,817,626, of which 93% included vaccine costs; the remaining costs were for administration fees and any adverse events (only grade 2-3 adverse events were observed in clinical trials of the mRNA-1345 vaccine)<sup>5</sup>
- Due to the reduced disease burden with vaccination, the RSV-related treatment costs decreased by nearly 30%, from €104,780,963 to €74,726,562, during the 3-year time frame
- Due to the reduced productivity loss with vaccination, these costs decreased from €319,038,558 to €258,751,064
- Table 2** provides a summary of the economic outcomes of the model

Table 2. Economic Outcomes of the Model Over a 3-Year Time Frame

	No vaccine	mRNA-1345	Difference
<b>RSV-related direct costs</b>	€104,780,963	€74,726,562	– €30,054,401
<b>Indirect costs</b>	€319,038,558	€258,751,064	– €60,287,494
<b>Vaccination costs</b>	€0	€589,817,626	€589,817,626
<b>Total</b>	€423,819,521	€923,295,252	€499,475,731

RSV, respiratory syncytial virus.

### Cost-Effectiveness Results

- The model predicted that without vaccination, there would be 3,401,978 life-years (LYs) lost due to RSV; with vaccination, LYs lost were reduced to 3,394,082. The total quality-adjusted LYs (QALYs) lost were reduced from 2,469,634 to 2,462,483 during the 3-year time frame of the model (**Table 3**)
- Based on the current list price of the vaccine, the incremental cost-effectiveness ratio was estimated at €69,849 per QALY gained without any adjustment for underreporting of RSV disease burden (**Table 3**)
- Correction for underreporting by assuming a 2.2-fold higher hospitalization rate provided incremental cost-effectiveness ratios, which were all around or below the Dutch willingness-to-pay threshold of €50,000/QALY gained (**Table 4**)

Table 3. Cost-Effectiveness for Different Age Groups Without Adjustment for Underreporting

Age group	Vaccination costs	Costs savings	QALY gain	ICER <sup>a</sup>
60+ years	€589,817,626	€90,341,895	7151	€69,849
70+ years	€317,328,781	€32,422,366	5802	€49,088
80+ years	€107,788,309	€13,742,928	3236	€29,067

ICER, incremental cost-effectiveness ratio; QALY, quality-adjusted life-year.

<sup>a</sup>Based on list price of €191.

Table 4. Cost-Effectiveness for Different Age Groups With Adjustment for Underreporting by 2.2x

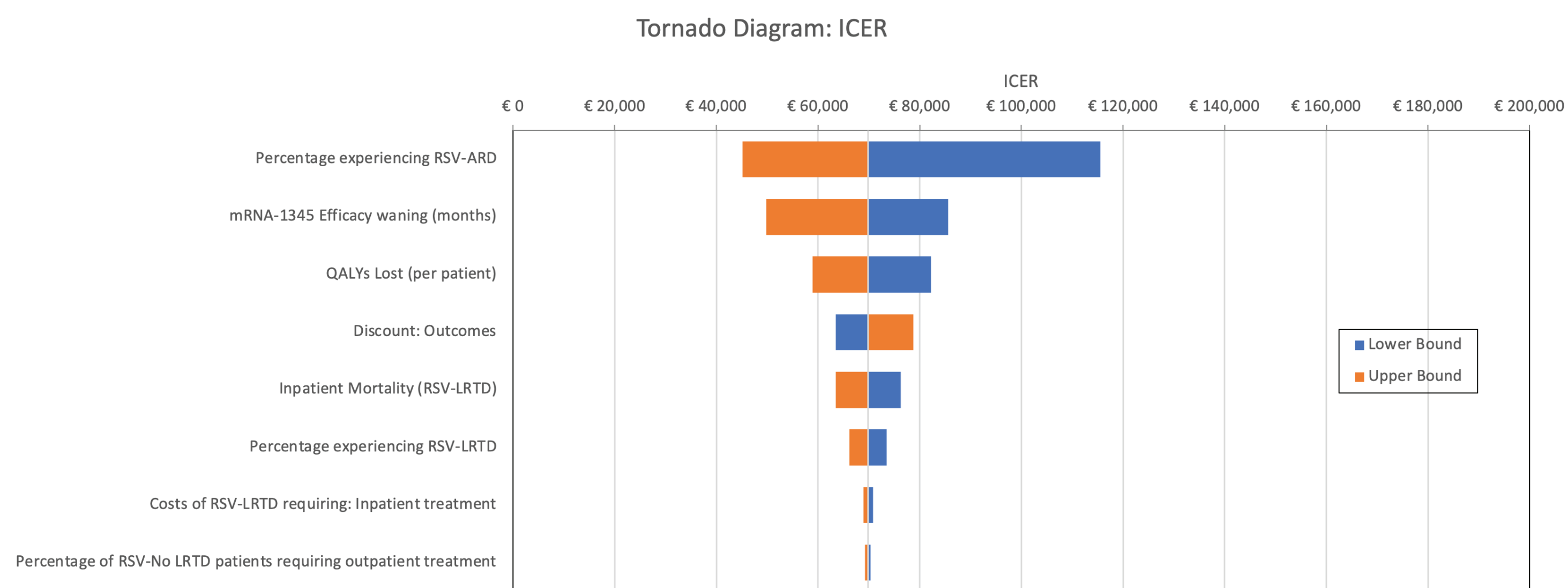
Age group	Vaccination costs	Costs savings	QALY gain	ICER <sup>a</sup>
60+ years	€589,817,626	€123,231,610	9003	€51,823
70+ years	€317,328,781	€59,990,860	7352	€35,002
80+ years	€107,788,309	€27,608,196	3824	€20,969

ICER, incremental cost-effectiveness ratio; QALY, quality-adjusted life-year.

<sup>a</sup>Based on list price of €191.

### Sensitivity Analysis

Figure 2. Tornado Diagram Base Case Scenario for Adults Aged ≥60 Years



ARD, acute respiratory disease; ICER, incremental cost-effectiveness ratio; LRTD, lower respiratory tract disease; QALY, quality-adjusted life-year; RSV, respiratory syncytial virus.

## CONCLUSIONS

- Our analysis suggests that RSV vaccination through the National Immunization Programme in the Netherlands is a cost-effective intervention for all adults aged ≥70 years
- When adjusting for underreporting of RSV disease burden, RSV vaccination is a likely cost-effective intervention for all adults aged ≥60 years
- The deterministic sensitivity analysis showed that the outcomes are most sensitive to the disease incidence, waning of vaccine-induced immunity, QALY losses due to RSV, and inpatient mortality
- Further work should focus on providing improved insight into the burden of RSV disease, in particular the underreporting of the disease, and collecting real-world evidence on vaccine effectiveness and durability

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### Acknowledgments

Editorial assistance was provided by Clare Miller, PhD, of MEDISTRAVA in accordance with Good Publication Practice (GPP 2022) guidelines, funded by Moderna, Inc., and under the direction of the authors.  
This study was funded by Moderna, Inc.



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