Supplementary Material

Cost-Effectiveness of Bivalent Respiratory Syncytial Virus Prefusion F Vaccine for Older Adults in the Netherlands

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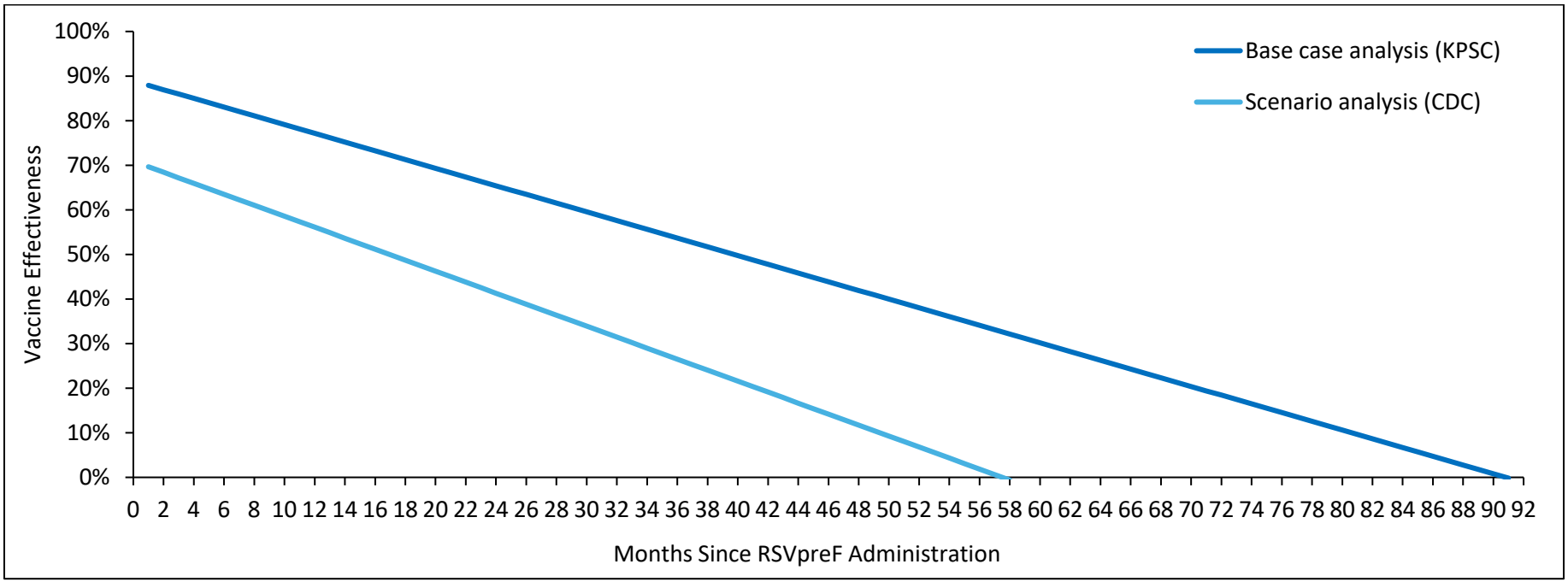
Supplemental Figure S1. Alternative vaccine effectiveness against RSV-related hospitalizations, by time since receipt



GP: general practitioner's office; H: hospital; NMA: non-medically attended; RSV: respiratory syncytial virus

Supplemental Table S1. Probabilistic sensitivity analysis variables sampled and distributional information

Variable	Distribution	Parameters
Disease incidence (annual, per 100,000)		
Hospitalized	Beta	Alpha: 6844; Beta: 14495156
General practitioner's office	Beta	Alpha: 76074.69; Beta: 7251925.31
Case-fatality rate (≤30 days)		
Hospitalized	Beta	Alpha: 35; Beta: 384
Vaccine effectiveness		
Hospitalized	Beta	Alpha: 32.04; Beta: 7.69
General practitioner's office	Beta	Alpha: 7.83; Beta: 3.68
General population utility	Beta	Alpha: 63,818,418; Beta: 5,589,398
Disutility (QALY loss)		
Hospitalized	Beta	Alpha: 3.97; Beta: 234.03
General practitioner's office	Beta	Alpha: 19.5; Beta: 3580.7
Non-medically attended	Beta	Alpha: 0.05; Beta: 24.95
Direct medical care costs (per episode)		
Hospitalized	Log-Normal	Mean: 6810.83; SE: 0.02

QALY: quality-adjusted life-years; RSV: respiratory syncytial virus

Supplemental Table S2. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646) -- 1-year time horizon

	No Intervention	**RSVpreF**	**Difference**
Clinical outcomes			
No. of cases			
Hospital	6,882	3,670	-3,211
General practitioner's office	22,549	14,694	-7,854
Non-medically attended	69,916	47,409	-22,507
No. of RSV-related deaths	919	485	-434
Life years (discounted)	2,493,635	2,493,926	291
Quality-adjusted life-years (discounted)	1,991,033	1,991,383	350
Economic outcomes (in millions)			
Medical care	€ 44.4	€ 24.0	-€ 20.4
Vaccination*	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 51.2	€ 32.2	-€ 19.0
Total costs	€ 95.7	€ 414.2	€ 318.5

*Vaccination costs include costs of vaccine and administration

Supplemental Table S3. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646) -- 5-year time horizon

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	32,272	17,821	-14,451
General practitioner's office	101,718	79,798	-21,920
Non-medically attended	318,306	272,045	-46,261
No. of RSV-related deaths	4,402	2,411	-1,991
Life years (discounted)	10,739,468	10,744,102	4,633
Quality-adjusted life-years (discounted)	8,497,271	8,501,107	3,836
Economic outcomes (in millions)			
Medical care	€ 194.5	€ 108.5	-€ 85.9
Vaccination*	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 179.2	€ 118.2	-€ 61.0
Total costs	€ 373.7	€ 584.7	€ 211.1

*Vaccination costs include costs of vaccine and administration

Supplemental Table S4. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among all adults aged ≥60 years in the Netherlands (N=4,880,031)* -- Subgroup analysis

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	231,499	206,842	-24,657
General practitioner's office	794,320	753,344	-40,976
Non-medically attended	2,436,510	2,355,742	-80,768
No. of RSV-related deaths	32,565	29,500	-3,064
Life years (discounted)	74,301,797	74,324,841	23,044
Quality-adjusted life-years (discounted)	60,804,494	60,822,265	17,771
Economic outcomes (in millions)			
Medical care	€ 1,095.7	€ 937.6	-€ 158.1
Vaccination**	€ 0.0	€ 710.7	€ 710.7
Non-medical	€ 808.0	€ 662.4	-€ 145.7
Total costs	€ 1,903.7	€ 2,310.7	€ 407.0
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 23,982
Cost per quality-adjusted life-year			€ 31,099
Societal perspective			
Cost per life year			€ 17,661
Cost per quality-adjusted life-year			€ 22,902

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S5. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (RSV-H incidence lower bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	82,838	69,511	-13,328
General practitioner's office	271,075	249,243	-21,832
Non-medically attended	889,879	843,934	-45,945
No. of RSV-related deaths	12,388	10,543	-1,846
Life years (discounted)	24,630,504	24,642,213	11,709
Quality-adjusted life-years (discounted)	18,835,310	18,844,161	8,851
Economic outcomes (in millions)			
Medical care	€ 393.6	€ 315.6	-€ 78.0
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 244.9	€ 190.9	-€ 54.0
Total costs	€ 638.6	€ 864.6	€ 226.0
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 23,914
Cost per quality-adjusted life-year			€ 31,635
Societal perspective			
Cost per life year			€ 19,302
Cost per quality-adjusted life-year			€ 25,535

DSA: deterministic sensitivity analysis; RSV-H: respiratory syncytial virus requiring hospitalization

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S6. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (RSV-H incidence upper bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	124,021	104,072	-19,949
General practitioner's office	270,582	248,837	-21,745
Non-medically attended	888,127	842,476	-45,651
No. of RSV-related deaths	18,542	15,780	-2,761
Life years (discounted)	24,600,515	24,618,052	17,537
Quality-adjusted life-years (discounted)	18,813,601	18,826,758	13,157
Economic outcomes (in millions)			
Medical care	€ 584.3	€ 467.9	-€ 116.4
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 334.4	€ 257.2	-€ 77.1
Total costs	€ 918.7	€ 1,083.2	€ 164.5
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 13,779
Cost per quality-adjusted life-year			€ 18,366
Societal perspective			
Cost per life year			€ 9,381
Cost per quality-adjusted life-year			€ 12,504

DSA: deterministic sensitivity analysis; RSV-H: respiratory syncytial virus requiring hospitalization

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S7. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (CFR lower bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	103,548	86,888	-16,660
General practitioner's office	271,023	249,200	-21,823
Non-medically attended	889,698	843,781	-45,917
No. of RSV-related deaths	12,388	10,543	-1,846
Life years (discounted)	24,630,504	24,642,213	11,709
Quality-adjusted life-years (discounted)	18,835,010	18,843,915	8,905
Economic outcomes (in millions)			
Medical care	€ 489.4	€ 392.1	-€ 97.3
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 264.7	€ 206.7	-€ 58.0
Total costs	€ 754.1	€ 956.8	€ 202.8
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 22,268
Cost per quality-adjusted life-year			€ 29,281
Societal perspective			
Cost per life year			€ 17,318
Cost per quality-adjusted life-year			€ 22,772

CFR: case-fatality rate; DSA: deterministic sensitivity analysis

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S8. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (CFR upper bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	103,351	86,727	-16,624
General practitioner's office	270,634	248,880	-21,754
Non-medically attended	888,307	842,628	-45,679
No. of RSV-related deaths	18,542	15,780	-2,761
Life years (discounted)	24,600,515	24,618,052	17,537
Quality-adjusted life-years (discounted)	18,813,900	18,827,004	13,104
Economic outcomes (in millions)			
Medical care	€ 488.7	€ 391.5	-€ 97.1
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 314.7	€ 241.5	-€ 73.2
Total costs	€ 803.3	€ 991.0	€ 187.7
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 14,877
Cost per quality-adjusted life-year			€ 19,909
Societal perspective			
Cost per life year			€ 10,704
Cost per quality-adjusted life-year			€ 14,325

CFR: case-fatality rate; DSA: deterministic sensitivity analysis

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S9. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (VE lower bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	103,449	89,994	-13,455
General practitioner's office	270,828	253,402	-17,426
Non-medically attended	889,002	852,387	-36,615
No. of RSV-related deaths	15,468	13,605	-1,864
Life years (discounted)	24,615,499	24,627,308	11,809
Quality-adjusted life-years (discounted)	18,824,448	18,833,332	8,884
Economic outcomes (in millions)			
Medical care	€ 489.0	€ 410.6	-€ 78.5
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 289.7	€ 237.0	-€ 52.7
Total costs	€ 778.7	€ 1,005.5	€ 226.8
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 23,673
Cost per quality-adjusted life-year			€ 31,468
Societal perspective			
Cost per life year			€ 19,209
Cost per quality-adjusted life-year			€ 25,534

DSA: deterministic sensitivity analysis; VE: vaccine effectiveness

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S10. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (VE upper bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	103,449	83,735	-19,714
General practitioner's office	270,828	244,674	-26,154
Non-medically attended	889,002	834,009	-54,993
No. of RSV-related deaths	15,468	12,740	-2,729
Life years (discounted)	24,615,499	24,632,832	17,333
Quality-adjusted life-years (discounted)	18,824,448	18,837,495	13,047
Economic outcomes (in millions)			
Medical care	€ 489.0	€ 373.8	-€ 115.2
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 289.7	€ 211.8	-€ 77.9
Total costs	€ 778.7	€ 943.6	€ 164.9
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 14,008
Cost per quality-adjusted life-year			€ 18,609
Societal perspective			
Cost per life year			€ 9,514
Cost per quality-adjusted life-year			€ 12,640

DSA: deterministic sensitivity analysis; VE: vaccine effectiveness

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S11. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (medical costs lower bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	103,449	86,807	-16,642
General practitioner's office	270,828	249,040	-21,788
Non-medically attended	889,002	843,204	-45,798
No. of RSV-related deaths	15,468	13,164	-2,304
Life years (discounted)	24,615,499	24,630,124	14,625
Quality-adjusted life-years (discounted)	18,824,448	18,835,454	11,006
Economic outcomes (in millions)			
Medical care	€ 391.2	€ 313.5	-€ 77.8
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 289.7	€ 224.1	-€ 65.6
Total costs	€ 680.9	€ 895.6	€ 214.7
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 19,163
Cost per quality-adjusted life-year			€ 25,464
Societal perspective			
Cost per life year			€ 14,679
Cost per quality-adjusted life-year			€ 19,507

DSA: deterministic sensitivity analysis

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S12. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- DSA (medical costs upper bound)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	103,449	86,807	-16,642
General practitioner's office	270,828	249,040	-21,788
Non-medically attended	889,002	843,204	-45,798
No. of RSV-related deaths	15,468	13,164	-2,304
Life years (discounted)	24,615,499	24,630,124	14,625
Quality-adjusted life-years (discounted)	18,824,448	18,835,454	11,006
Economic outcomes (in millions)			
Medical care	€ 586.8	€ 470.2	-€ 116.6
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 289.7	€ 224.1	-€ 65.6
Total costs	€ 876.5	€ 1,052.3	€ 175.8
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 16,504
Cost per quality-adjusted life-year			€ 21,931
Societal perspective			
Cost per life year			€ 12,021
Cost per quality-adjusted life-year			€ 15,974

DSA: deterministic sensitivity analysis

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration

Supplemental Table S13. Health and economic outcomes and cost-effectiveness for RSVpreF versus no intervention among at-risk adults aged 60-74 years and all adults aged ≥75 years in the Netherlands (N=2,586,646)* -- Scenario (RSV-H VE from CDC)

	No Intervention	RSVpreF	Difference
Clinical outcomes			
No. of cases			
Hospital	103,449	94,542	-8,908
General practitioner's office	270,828	248,949	-21,879
Non-medically attended	889,002	842,879	-46,123
No. of RSV-related deaths	15,468	14,246	-1,222
Life years (discounted)	24,615,499	24,623,539	8,041
Quality-adjusted life-years (discounted)	18,824,448	18,830,605	6,157
Economic outcomes (in millions)			
Medical care	€ 489.0	€ 435.0	-€ 54.0
Vaccination**	€ 0.0	€ 358.0	€ 358.0
Non-medical	€ 289.7	€ 247.5	-€ 42.2
Total costs	€ 778.7	€ 1,040.5	€ 261.8
Cost-effectiveness			
Healthcare system perspective			
Cost per life year			€ 37,811
Cost per quality-adjusted life-year			€ 49,379
Societal perspective			
Cost per life year			€ 32,561
Cost per quality-adjusted life-year			€ 42,523

CDC: United States Centers for Disease Control and Prevention; RSV-H: respiratory syncytial virus requiring hospitalization; VE: vaccine effectiveness

*Clinical outcomes and economic costs were projected over a lifetime; in the Hypothetical Strategy, persons in the model population may have received RSVpreF during the first year of the modeling horizon and vaccine was assumed to provide some protection for nearly 8 years following administration

**Vaccination costs include costs of vaccine and administration