The Potential Public Health and Economic Benefit of an mRNA-Based Respiratory Syncytial Virus Vaccine Among Adults ≥60 Years in the United States (US)

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SUPPLEMENTARY MATERIAL

Supplemental Table 1. Model Parameters

Model Parameter	Value (DSA Range)			Data Source
US population size by age group (years), year 1 (2022 values)[a]				
60-64 years	21,118,423			US Census Bureau PD. Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States: April 1, 2020, to July 1, 2022 (NC-EST2022-AGESEX); Released June 2023[1]
65-69 years	18,631,422			
70-74 years	15,157,017			
75-79 years	10,861,000			
80-84 years	6,659,545			
85+ years	6,485,868			
Total	78,913,275			
% of RSV-ARD patients with RSV-LRTD by age group (years), unvaccinated[b]				
60-64 years	12.4 (10.6, 14.2)			Derived via calibration using McLaughlin et al. (2022)[2] as target endpoint
65-69 years	17.7 (15.1, 20.2)			
70-74 years	22.4 (19.2, 25.7)			
75+ years	57.0 (48.7, 65.4)			
% of RSV-LRTD patients requiring treatment by age group (years), unvaccinated				
	Care setting			
	Inpatient	Outpatient	No treatment	
60-64 years	3.3	96.7	0	Tong et al. (2020)[3]
65-74 years	8.7	91.3		
70-84 years	14.6	85.5		
85+ years	17.7	82.3		
% of RSV No-LRTD patients requiring treatment by age group (years)				
	Care setting			
	Inpatient	Outpatient[c]	No treatment	
60-64 years	0	22.9 (17.7, 28.2)	77.1	Derived via calibration using McLaughlin et al. (2022)[2] as target endpoint
65+ years		19.5 (4.2, 39.9)	80.5	

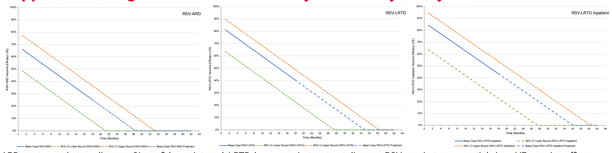
ARD, acute respiratory disease; CI, confidence interval; DSA, deterministic sensitivity analysis; LRTD, lower respiratory tract disease; RSV, respiratory syncytial virus; US, United States.

[a]Values were not varied in sensitivity analyses.

[b]The proportions with RSV-LRTD and RSV No-LRTD sum to 100% in the model; accordingly, the proportions with RSV No-LRTD were calculated by subtracting the proportions with RSV-LRTD from 100%. Ranges established using the 95% CIs around the calibration endpoint.

[c]The upper and lower 95% CI from McLaughlin et al. [10] for both calibration targets were used to create the sensitivity analysis ranges (ie, percentages with RSV-LRTD and with RSV-No LRTD requiring outpatient care were recalibrated simultaneously); as the percentage seeking outpatient care varies, the corresponding percentages of patients with no treatment were calculated by subtracting the percentage of patients seeking outpatient care from 100%.

Supplemental Figure 1. Vaccine Efficacy Sensitivity Analysis



ARD, acute respiratory disease; CI, confidence interval; LRTD, lower respiratory tract disease; RSV, respiratory syncytial virus; VE, vaccine efficacy.

Supplemental Table 2. Base-Case Analysis (3-Year Time Frame) Clinical Results

	No Vaccine	mRNA-1345	Difference[a]	% Change
RSV-ARD				
Cases	13,150,645	9,647,735	-3,502,911	-27%
Medically attended cases	5,710,971	4,258,614	-1,452,357	-25%
RSV-LRTD				
Cases	3,773,351	2,612,899	-1,160,451	-31%
Outpatient visits	3,322,695	2,314,158	-1,008,537	-30%
Hospitalizations	450,656	298,741	-151,914	-34%
Deaths	34,141	22,632	-11,509	-34%
RSV-No LRTD				
Cases	9,377,295	7,959,448	-1,417,847	-15%
Outpatient visits	1,937,621	1,645,715	-291,906	-15%

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

[a]mRNA-1345 minus no vaccine.

Supplemental Table 3. Scenario Analysis (2-Year Time Frame) Clinical Results

	No Vaccine	mRNA-1345	Difference[a]	% Change
RSV-ARD				
Cases	8,900,298	6,372,797	-2,427,501	-28%
Medically attended cases	3,880,164	2,540,753	-1,339,411	-35%
RSV-LRTD				
Cases	2,573,295	1,540,914	-1,032,382	-40%
Outpatient visits	2,264,266	1,365,398	-898,868	-40%
Hospitalizations	309,029	175,515	-133,513	-43%
Deaths	23,411	13,297	-10,115	-43%
RSV-No LRTD				
Cases	6,327,003	4,831,883	-1,495,120	-24%
Outpatient visits	1,306,868	999,839	-307,029	-24%

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

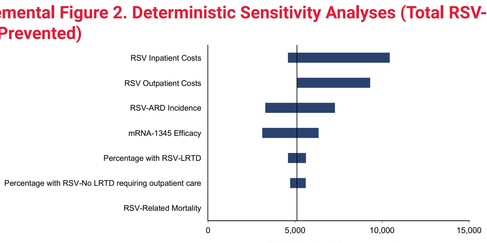
[a]mRNA-1345 minus no vaccine.

Supplemental Table 4. Scenario Analysis (2-Year Time Frame) Economic Results (in millions)

	No Vaccine	mRNA-1345	Difference[a]	% Change
Total costs	$13,161	$8470	-$4691	-36%
Healthcare	$11,618	$7337	-$4281	-40%
Lost productivity	$1543	$1133	-$410	-27%

[a]mRNA-1345 minus no vaccine.

Supplemental Figure 2. Deterministic Sensitivity Analyses (Total RSV-Related Costs Prevented)



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

References

1. US Census Bureau Population Division. Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States: April 1, 2020 to July 1, 2022 (NC-EST2022-AGESEX). Released June 2023. Available from: https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-detail.html.
2. McLaughlin JM, et al. 2022;9(7):1-10.
3. Tong S, et al. *J Glob Health*. 2020;10(2):020422.

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