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ASSESSING THE PUBLIC HEALTH IMPACT OF THE ADJUVANTED RESPIRATORY SYNCYTIAL VIRUS PREFUSION F PROTEIN VACCINE (RSVPreF3 OA) AMONG OLDER ADULTS IN THE UNITED STATES (US)

SCAN ME

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INTRODUCTION

Respiratory syncytial virus (RSV) is a **contagious pathogen** that causes acute respiratory illness (ARI) in individuals of all ages.[1]

RSV infection occurs annually in 3–7% of healthy older adults (OA) and in 4–10% adults who are at increased risk of severe RSV.[2]

This study estimates the **public health impact of vaccinating US adults aged ≥60 years** with a single dose of adjuvanted RSVPreF3 OA vaccine.

METHODS

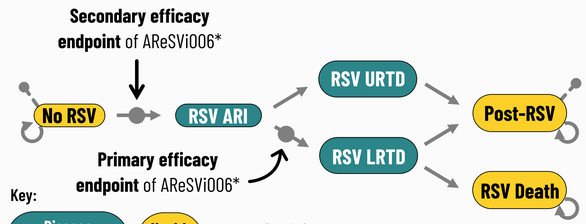
Static Markov cohort model

- Evaluated the impact of adjuvanted RSVPreF3 OA vaccine on symptomatic RSV cases, morbidity, and mortality, compared with no vaccination among US adults aged ≥60 years.
- Used a 1-year time horizon (assuming no reinfections), with a 1-month cycle length.
- Classified RSV ARI cases as upper or lower respiratory tract disease cases (URTD or LRTD, respectively).

Inputs

- Population estimates, RSV epidemiology, and health care resource use inputs were obtained from standard US sources and published literature (see Supplement).
- Vaccination coverage rates were assumed to be the same as for influenza vaccines in the 2021-2022 season (60-64-year-olds: 52.4%; ≥65-year-olds: 73.9%).

Schematic structure of the Markov model

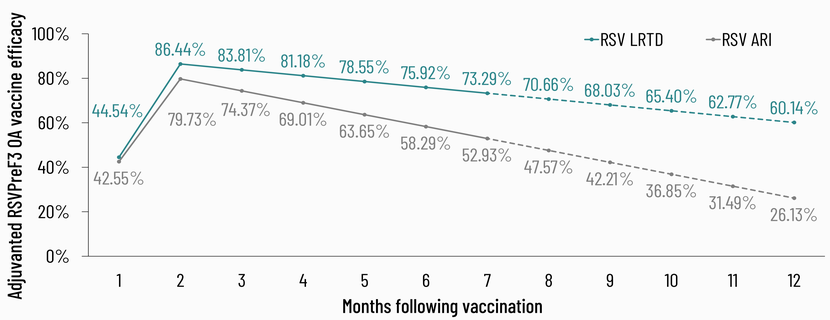


*AReSVi006 (Adult Respiratory Syncytial Virus) phase III clinical trial[3]

Model assumes 50% of peak vaccine efficacy during month 1.

The benefits of RSV vaccination considered in the model include reductions in the probability of developing RSV ARI and RSV LRTD.

Vaccine efficacy and waning by month



Dashed lines represent extrapolation beyond the median trial follow-up period of the first season in the AReSVi006 phase III clinical trial.

Linear regression model fitted based on the AReSVi006 phase III clinical trial (median follow-up time: 6.7 months) to **estimate peak vaccine efficacy** (intercept) and **monthly waning** rate (slope) for RSV ARI and RSV LRTD.[3]

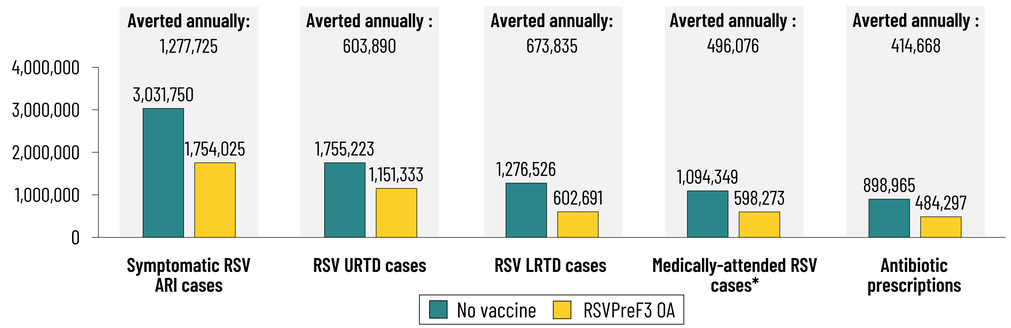
- **Peak efficacy**
  - RSV LRTD: 89.07%
  - RSV ARI: 85.09%
- **Monthly waning**
  - RSV LRTD: 2.63%
  - RSV ARI: 5.36%

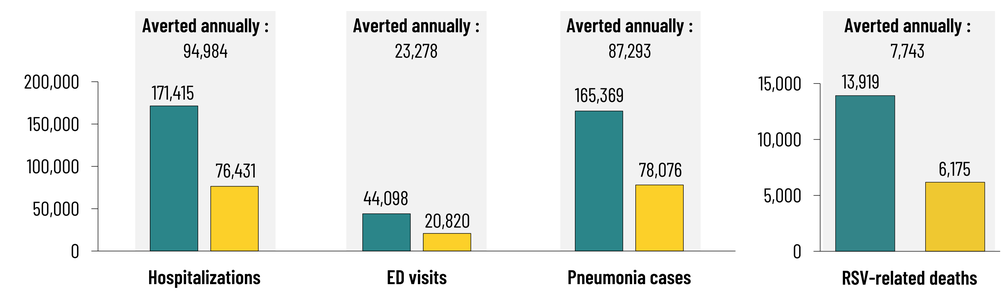
Supplementary details on methods available through QR-code scanning

RESULTS

The model estimates that, compared to no vaccination, adjuvanted RSVPreF3 OA vaccine would substantially reduce the burden of RSV among US adults aged ≥60 years by preventing RSV cases and their associated health care resource use, antibiotic use, complications, and deaths.

A total of 55,282,554 individuals received the RSVPreF3 OA vaccine in the scenario with vaccination





** Because each medically-attended case was assumed to have 1 outpatient visit: medically-attended RSV cases = number of modeled outpatient visits.*

Outcome	Number needed to vaccinate to avoid one case
RSV ARI case	43
RSV LRTD case	82
Medically-attended RSV case	111
RSV hospitalization	582
RSV-related death	7,139

LIMITATIONS

The current analysis does not capture benefits of RSV vaccination beyond the 1-year time horizon

The model assumes RSV-related deaths only occur in hospitalized cases.

The model does not account for disease attenuation from the vaccine in breakthrough cases.

CONCLUSIONS

- ✓ Assuming the same vaccination coverage as for influenza vaccines, the adjuvanted RSVPreF3 OA vaccine has the potential to avert nearly 1.3 million symptomatic RSV cases, 95,000 RSV-related hospitalizations, and 8,000 RSV-related deaths annually among US adults aged ≥60 years vs. no vaccination.
- ✓ To achieve this modeled public health impact in real-world practice, efforts will be needed to support RSV vaccination among older adults (e.g., through patient and healthcare provider education on RSV disease and vaccines).

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SUPPLEMENTARY MATERIAL

Key inputs and assumptions

- Total eligible population (≥60 years): 81,001,651.[4]
- Vaccine efficacy inputs were based on the results from the first season of the AReSVi006 phase III clinical trial.[3]
- In alignment with the clinical trial design, the model assumes 50% of peak efficacy during the month of vaccination (with vaccine efficacy waning applied starting in month 2).
- Accounts for seasonality of RSV incidence using inputs below (based on data pre-COVID).

Seasonality factor for RSV ARI infections[6]

January	275.4%
February	233.5%
March	174.4%
April	49.2%
May	16.2%
June	8.5%
July	6.0%
August	3.0%
September	10.3%
October	34.0%
November	102.7%
December	286.7%

Data input table

Epidemiology input	Base-case value (range)	Source(s)
Annual incidence of symptomatic RSV ARI per person year at risk	0.0385 (0.0211-0.0568)	2, 7, 8
% of RSV ARI cases that are RSV LRTD	42.1% (32.2-52.0%)	3
% of RSV ARI cases that are medically attended		
RSV URTD	25.3%	2, 7-9
RSV LRTD	51.0%	
% of medically-attended RSV LRTD cases that are hospitalized		
60-64 years	10.7%	7
65-74 years	28.0%	
≥75 years	37.5%	
% of RSV LRTD cases resulting in pneumonia	13.0%	2, 7-9
Probability of death given RSV LRTD		
60-64 years	0.0039 (0.0021-0.0056)	2, 7-10
65-74 years	0.0102 (0.0055-0.0148)	
≥75 years	0.0180 (0.0127-0.0233)	

Healthcare resource use per RSV LRTD and URTD case[7]

HCRU per case	URTD	LRTD
Hospitalization		
60-64 years	NA	5.43%
65-74 years		14.29%
≥75 years		19.12%
ED visit	NA	3.45%
OP visit	25.29%	50.95%
Antibiotic prescription	18.56%	44.91%

Sensitivity analyses

Adjuvanted RSVPreF3 OA vaccine resulted in reduced RSV burden across a range of one-way sensitivity analyses in which key epidemiology inputs were varied.

		RSV incidence		% of RSV cases that are LRTD		RSV mortality	
Annual number of cases avoided by vaccination		**Lower bound**	**Upper bound**	**Lower bound**	**Upper bound**	**Lower bound**	**Upper bound**
	Base-case	0.0211	0.0568	32.2%	52.0%	See values in table above	
Symptomatic RSV ARI cases	1,277,725	706,032	1,863,672	1,277,725	1,277,725	1,277,725	1,277,725
RSV URTD cases	603,890	334,215	879,368	761,948	445,832	603,890	603,890
RSV LRTD cases	673,835	371,818	984,304	515,776	831,893	673,835	673,835
Medically-attended RSV cases	496,076	273,982	723,943	455,510	536,641	496,076	496,076
Hospitalizations	94,984	52,411	138,749	72,704	117,264	94,984	94,984
ED visits	23,278	12,845	34,003	17,818	28,738	23,278	23,278
Pneumonia cases	87,293	48,168	127,513	66,817	107,769	87,293	87,293
Antibiotics prescription	414,668	228,995	605,213	373,013	456,323	414,668	414,668
RSV-related deaths	7,743	4,273	11,311	5,927	9,560	4,856	10,631

ABBREVIATIONS

AReSVi006	AReSVi006 (Adult Respiratory Syncytial Virus) phase III clinical trial
ARI	acute respiratory illness
ED	emergency department
LRTD	lower respiratory tract disease
NA	not applicable
OA	older adults
OP	outpatient
RSV	respiratory syncytial virus
RSVPreF3	Respiratory Syncytial Virus Prefusion F Protein Vaccine
URTD	upper respiratory tract disease
US	United States

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DISCLOSURES

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DM, EL, FV, DC and SP are employed by GSK and hold shares in GSK. Jonathan Graham is employed by RTI Health Solutions, a not-for-profit organization, which received funding from GSK for the conduct of this study. Laure-Anne Van Bellinghen is employed by CHESS in Health which received funding from GSK for research consulting services. The authors declare no other financial and non-financial relationships and activities.

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