Economics of Vaccinating U.S. Adults ≥60 years-old against Respiratory Syncytial Virus

UPDATED SUMMARY COMPARING MODELS FROM:
GSK, Pfizer AND University of Michigan-CDC

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NCIRD/CDC
ACIP Meeting, June 21, 2023

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.
Conflict of interest

• **GSK model**: Daniel Molnar et al., [complete list and affiliations, upon request]
  - GSK manufactures the adjuvanted RSVPreF3 vaccine
  - RTI Health Solutions was funded by GSK

• **Pfizer model**: Derek Weycker et al., [complete list and affiliations, upon request]
  - Pfizer manufacturers the bivalent RSVpreF vaccine
  - Policy Analysis Inc. was funded by Pfizer

• **UM-CDC model**: David W Hutton et al. from Univ Michigan, ..., Ismael R Ortega-Sanchez et al. from CDC [complete list and affiliations, upon request]
  - All authors: No conflicts of interest
Economic analysis

Policy questions: Should adults ≥65 years of age (or ≥60 years of age) receive one dose of Respiratory Syncytial Virus (RSV) vaccine (GSK or Pfizer product) for the prevention of RSV disease and its complications?

Question: Is vaccinating adults aged ≥65 years (or ≥60 years) against RSV cost-effective?

Comparator
Unvaccinated
≥65yr-olds
(or ≥60yr-olds)

Intervention
Vaccinating
≥65yr-olds
(or ≥60yr-olds)

Base-case scenario: What is the incremental cost-effectiveness of vaccinating adults aged ≥65 years (or ≥60 years) using RSV vaccine relative to “No vaccination”? 
Focus on key features for model comparison

• Modeling approach
  • Targeted population(s)
  • Perspective (healthcare vs. societal)
  • Intervention strategy and comparator

• Inputs for RSV disease burden, vaccine efficacy, and costs
  • Incidence of RSV disease, rates of outcomes
  • Direct and indirect costs of RSV disease
  • Intervention: Vaccine efficacy, duration of protection, safety and program costs

• Assumptions
  • Strong, influential assumptions

Note: For this and all slides, to specifically identify changes and updates from those presented last February 2023, the text will appear either highlighted, marked in red or with the word updated at the top of the slide or table.
## Modeling design and assumptions

<table>
<thead>
<tr>
<th>Static analytical decision-making models</th>
<th>GSK</th>
<th>Pfizer</th>
<th>UM-CDC</th>
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<tbody>
<tr>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Sensitivity analyses (and probabilistic simulation)</td>
<td>✔(✔)</td>
<td>✔(✔)</td>
<td>✔(✔)</td>
</tr>
<tr>
<td>Hypothetical population ≥65yrs-old (and ≥60-yrs-old)</td>
<td>✔(✔)</td>
<td>✔(✔)</td>
<td>✔(✔)</td>
</tr>
<tr>
<td><strong>Time Frame: at least 2 yr. after a dose of RSV vaccine</strong></td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Analytic Horizon: Age-specific Life Expectancy</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Discount rate: 3%</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Year of economic outcomes measured: 2022</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Societal perspective (and healthcare perspective)</td>
<td>✔(✔)</td>
<td>✔(✔)</td>
<td>✔(✔)</td>
</tr>
</tbody>
</table>
Inputs and main outcomes

Prevention of:
- Outpatient visits for RSV
- RSV hospitalizations
- RSV-associated deaths

QALYs saved
$/QALY saved

Number needed to vaccinate (NNV) to avert an:
- Outpatient visit for RSV
- RSV hospitalization
- RSV-associated death

HCRU = health care resource use
### GSK, Pfizer and UM-CDC models comparison:
Selected outcome ratios for RSV vaccines (Feb 2023)

#### GSK vaccine

<table>
<thead>
<tr>
<th>Vaccination Group</th>
<th>UM-CDC model Vac Price $100</th>
<th>GSK model Vac Price $148</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ / QALY gained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>180,720</td>
<td>68,489</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>229,895</td>
<td>78,971</td>
</tr>
<tr>
<td>$ / hospitalization averted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>101,406</td>
<td>57,114</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>133,992</td>
<td>69,638</td>
</tr>
</tbody>
</table>

#### Pfizer vaccine

<table>
<thead>
<tr>
<th>Vaccination Group</th>
<th>UM-CDC model Vac Price $100</th>
<th>Pfizer model Vac Price $200</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ / QALY gained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>189,407</td>
<td>43,749</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>233,779</td>
<td>50,197</td>
</tr>
<tr>
<td>$ / hospitalization averted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>122,886</td>
<td>19,845</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>161,310</td>
<td>23,271</td>
</tr>
</tbody>
</table>
### GSK, *Pfizer* and UM-CDC models comparison:
Selected outcome ratios for RSV vaccines *(June 2023)*

<table>
<thead>
<tr>
<th></th>
<th>UM-CDC model Vac Price</th>
<th>GSK model Vac Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$ / QALY gained</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>167,301</td>
<td>55,088</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>205,638</td>
<td>64,348</td>
</tr>
<tr>
<td><strong>$ / hospitalization averted</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>94,375</td>
<td>43,456</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>120,056</td>
<td>53,644</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>UM-CDC model Vac Price</th>
<th><em>Pfizer</em> model Vac Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>$ / QALY gained</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>94,673</td>
<td>19,585</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>118,735</td>
<td>23,921</td>
</tr>
<tr>
<td><strong>$ / hospitalization averted</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccinating adults ≥65 yrs.</td>
<td>56,571</td>
<td>8,797</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 yrs.</td>
<td>75,382</td>
<td>10,982</td>
</tr>
</tbody>
</table>
UM-CDC model: Updated One-way Sensitivity Analyses
Base case: Age ≥65yrs; $167,301/QALY (GSK), $94,673/QALY (Pfizer)

GSK: $/QALY gained (thousands)

- Incidence of RSV hospitalization
- VE against hospitalization and ED S2
- Vaccine Cost
- Outpatient QALYs Lost, Adult
- Cost per Hospitalization
- VE against hospitalization and ED S1
- Incidence of outpatient visits for RSV
- Mortality, adults hospitalized with RSV
- VE against outpatient illness S2
- ED Incidence

Pfizer: $/QALY gained (thousands)

- Incidence of RSV hospitalization
- VE against hospitalization and ED S2
- Vaccine Cost
- Outpatient QALYs Lost, Adult
- Cost per Hospitalization
- VE against hospitalization and ED S1
- Incidence of outpatient visits for RSV
- Mortality, adults hospitalized with RSV
- VE against outpatient illness S2
- ED Incidence

- Low Assumption
- High Assumption

Vaccine cost per dose $270/dose (GSK), $200/dose (Pfizer)
Two-year time frame
Age-based vaccination recommendation: ≥65 years, VE=Vaccine Efficacy LRTD= Lower Respiratory Tract Disease, S1=Season 1, S2=Season 2.
### GSK model: Updated One-way Sensitivity Analyses

#### Base case: Age ≥60 years; $64,348/QALY saved*

<table>
<thead>
<tr>
<th>Input Value</th>
<th>Low Input Value</th>
<th>High Input Value</th>
</tr>
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<tbody>
<tr>
<td>Average annual incidence of first RSV ARI event</td>
<td></td>
<td></td>
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<tr>
<td>Percentage of RSV LRTD cases resulting in hospitalization</td>
<td></td>
<td></td>
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<tr>
<td>Efficacy against RSV LRTD: Waning rates first vaccination with RSVPreF3 vaccine &lt;36 months</td>
<td></td>
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</tr>
<tr>
<td>RSVPreF3 vaccine: Peak % efficacy after first vaccination against RSV LRTD caused by first RSV infection</td>
<td></td>
<td></td>
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<tr>
<td>Probability of death given RSV LRTD</td>
<td></td>
<td></td>
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<tr>
<td>Vaccination costs per administered dose with RSVPreF3 vaccine - Purchase cost per dose – Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion RSV LRTD within first RSV ARI event</td>
<td></td>
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</tr>
<tr>
<td>Baseline QALYs - General population</td>
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<tr>
<td>Efficacy against RSV ARI: Waning rates first vaccination with RSVPreF3 vaccine &lt;36 months</td>
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</tr>
<tr>
<td>RSVPreF3 vaccine: Peak % efficacy after first vaccination against first RSV ARI event</td>
<td></td>
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<tr>
<td>Direct cost per RSV LRTD event @ 1st infection - Unvaccinated</td>
<td></td>
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</tbody>
</table>

* GSK base-case vaccine price = $270/dose, three-year time frame
Pfizer model: Updated One-way Sensitivity Analyses
Base case: Age≥60 years: $23,921/QALY saved*

* Pfizer base-case vaccine price = $200/dose, RSV-H= RSV-associated hospitalization
GSK, Pfizer and UM-CDC models comparison: Selected inputs

• RSV-hospitalization rate
  GSK: Proportion of medically attended RSV hospitalized cases identified by PCR, differentiated by age (Belongia, 2018)
  Pfizer: Differentiated by age and comorbidity profile (Pfizer data on file)
  CDC: Differentiated by age (four RSV seasons in CDC RSV-NET data)

• Initial VE & waning over time: (updated data from GSK’s & Pfizer’s phase 3)
  GSK: VE peaks in month 2, wanes linearly, reaching 0% at 34 or 43mos (depending on outcome)
  Pfizer: VE is flat 7mos, wanes linearly thereafter, reaches 0% at 24mos
  CDC: Step-wise: VE flat 7mos, partial drop & flat 7-14mos (Pfizer), 7-18mos (GSK), reaches 0% at 24mos

• Unitary medical cost of RSV outcomes
  GSK: Age- & outcome specific cost for symptomatic RSV LRTD & URTI cases (medically attended and non-medically attended) (data from Centers for Medicare and Medicaid Services)
  Pfizer: Age-, outcome- & comorbidity-specific cost for medically attended RSV illness
  CDC: Age- & outcome-specific cost for medically attended RSV illness

ARI = acute respiratory infection
LRTD = lower respiratory tract disease
URTI = upper respiratory tract illness
GSK, Pfizer and UM-CDC models: Key differences in model inputs

<table>
<thead>
<tr>
<th></th>
<th>UM-CDC</th>
<th>GSK</th>
<th>Pfizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence of RSV outpatient illness</td>
<td>2,278 (base-case for adults ≥65 years)(a)</td>
<td>1,348 (for adults ≥65 years)(b)</td>
<td>2,430 (base case for adults ≥65 years)(c)</td>
</tr>
<tr>
<td>(per 100,000 persons per year)</td>
<td></td>
<td></td>
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<tr>
<td>Incidence of RSV hospitalization</td>
<td>162 (base-case for adults ≥65 years)(d)</td>
<td>256.3 (for adults ≥65 years)(b,e)</td>
<td>300 (base-case for adults ≥65 years)(c)</td>
</tr>
<tr>
<td>(per 100,000 persons per year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct medical costs per RSV</td>
<td>$21,417 – $22,425 (age-dependent)(f)</td>
<td>$13,112 – $26,224 (age-dependent)(g,h)</td>
<td>$12,048 – $38,380 (age- and comorbidity-</td>
</tr>
<tr>
<td>hospitalization</td>
<td></td>
<td></td>
<td>dependent)(h,i)</td>
</tr>
</tbody>
</table>

\(\text{a}\) McLaughlin et al. Open Forum Infect Dis (2022): [https://doi.org/10.1093/ofid/ofac300](https://doi.org/10.1093/ofid/ofac300)

\(\text{b}\) Adapted from Belongia et al. Open Forum Infect Dis (2018): [https://doi.org/10.1093/ofid/ofy316](https://doi.org/10.1093/ofid/ofy316)

\(\text{c}\) Adapted from McLaughlin et al. Open Forum Infect Dis (2022): [https://doi.org/10.1093/ofid/ofac300](https://doi.org/10.1093/ofid/ofac300); Ramirez et al. Infect Dis Ther (2023): [https://doi.org/10.1007/s40121-023-00805-1](https://doi.org/10.1007/s40121-023-00805-1)

\(\text{d}\) RSV-NET, CDC unpublished data. Age-specific hospitalization rate per 100,000: 65.5 (60 to <65yrs), 93.8 (65 to <70yrs), 118.7 (70 to <75yrs) and 302.9 (75+yrs). Crude surveillance rates were upwardly adjusted 1.5x due to incomplete case detection from reliance on upper respiratory RT-PCR (McLaughlin et al. Open Forum Infect Dis (2022): [https://doi.org/10.1093/ofid/ofac300](https://doi.org/10.1093/ofid/ofac300))


\(\text{g}\) CMS Medicare Inpatient Hospitals (DRG Average Payments from 2019 dataset)


\(\text{i}\) Merative MarketScan Commercial Claims and Encounters (CCAE) and Medicare Supplemental Coordination of Benefits (MDCR) Databases (2016-2019)
UM-CDC model: Sensitivity of Cost per QALY saved to RSV-Related Hospitalization Rates among Adults ≥65 years: 2-year timeframe

Base case for Pfizer and GSK are shown with blue and orange solid filled diamond markers, respectively: Estimated using the adjusted mean RSV-related hospitalization rate over RSV seasons: 2015-16, 2016-17, 2017-18, and 2018-19. Adjusted rate for lower sensitivity of PCR testing. CDC RSVnet

Blue ball markers: Estimated using Pfizer vaccine VE and price input data for the specific hospitalization rate as reported by the reference.

Orange ball markers: Estimated using GSK vaccine VE and price input data for the specific hospitalization rate as reported by the reference.

Labels in markers: They refer to the specific source of the RSV-associated hospitalization rate used in the estimation of either vaccine cost per QALY saved. Parentheses include either the year of the publication or the place where the data for the study was collected.
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Orange ball markers: Estimated using GSK vaccine VE and price input data for the specific hospitalization rate as reported by the reference.

Labels in markers: They refer to the specific source of the RSV-associated hospitalization rate used in the estimation of either vaccine cost per QALY saved. Parentheses include either the year of the publication or the place where the data for the study was collected.


**GSK, Pfizer and UM-CDC: Initial or Early Peak of Vaccine Efficacy & Decline in Season 2 (updated)**

<table>
<thead>
<tr>
<th></th>
<th>UM-CDC Model</th>
<th>GSK Model</th>
<th>Pfizer Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GSK vaccine</td>
<td>Pfizer vaccine</td>
<td>GSK vaccine</td>
</tr>
<tr>
<td><strong>Vaccine efficacy (VE) against RSV outpatient illness</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>79.0 (54.3–91.5)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>65.2 (36.0–82.0)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Season 1 Peak: 74.2 (56.4–94.0)</td>
</tr>
<tr>
<td></td>
<td>27.8 (0 – 60.4)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>55.0 (0 – 82.0)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Weighted linear regression over time of estimated efficacy from clinical trial&lt;sup&gt;e&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>VE against RSV hospitalization and emergency department visit</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td>87.5 (58.9–97.6)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>84.6 (32.0–98.3)&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Season 1 Peak: 88.0 (65.8–99.2)</td>
</tr>
<tr>
<td></td>
<td>52.9 (0 – 81.2)&lt;sup&gt;d&lt;/sup&gt;</td>
<td>75.0 (0 – 97.4)&lt;sup&gt;e&lt;/sup&gt;</td>
<td>Weighted linear regression over time of estimated efficacy from clinical trial&lt;sup&gt;f&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Notes:**

- a VE over median (GSK) or mean (Pfizer) 7 months for season 1, VE through a median 18 months (GSK) or 14 months (Pfizer) for season 2 as reported in the follow up in phase 3 clinical trials
- b Manufacturer phase 3 trial data; VE against medically attended acute respiratory illness
- c GSK phase 3 trial data; VE against acute respiratory illness, regardless of whether medically attended. Reported peak value at month 2.
- d GSK phase 3 trial data; VE against medically attended lower respiratory tract disease
- e Pfizer phase 3 trial data; VE against medically attended lower respiratory tract illness with ≥3 lower respiratory symptoms
- f GSK phase 3 trial data; VE against lower respiratory tract disease, regardless of whether medically attended. Reported peak value at month 2.
**GSK, Pfizer and UM-CDC: Assumption on waning of vaccine efficacy (VE) per outcome (Feb 2023)**

| **GSK** | VE peaks at 2 months then wanes per month  
RSV-ARI = 5.36% points per month (range: 0.00-13.37%)  
RSV-LRTD = 2.63% points per month (range: 0.00-10.95%)  
No residual protection after 12 months |
| **Pfizer** | Initial VE assumed to persist for 7 months,  
Then to decline linearly to 0% effectiveness at 24 months  
Residual though declining protection up to 24 months |
| **UM-CDC** | Vaccine and outcome-specific  
For both vaccines:  
Exponential decay up to 12 months  
and then 0% afterwards; calibrated such that the first 6 months VE equals the trial estimate |
GSK, Pfizer and UM-CDC: Assumption on waning of vaccine efficacy (VE) per vaccine & outcome (June 2023)

The pink-shaded areas denote a higher level of uncertainty of the waning assumption beyond available phase 3 data.
**GSK**: Residual Vaccine Effectiveness (Feb 2023 ACIP) and *updated* analyses (June 2023)

**RSV LRTD**: 50% of peak VE (88%) assumed in month 1, peak VE declines by 2.10% (2.63% in Feb) monthly rate beginning in month 2 though 20-month maximum follow up of trial. Assumed to follow linear decline trend afterwards. Reaches 0% in month 43

**RSV ARI**: 50% of peak VE (74%) assumed in month 1, peak VE declines by 2.26% (5.36% in Feb) monthly rate beginning in month 2 though 20-month maximum follow up of trial. Assumed to follow linear decline trend afterwards. Reaches 0% in month 34

The pink-shaded area denotes a higher level of uncertainty of the waning assumption beyond available phase 3 data
**Pfizer**: Residual Vaccine Effectiveness (Feb 2023 ACIP) and *updated* analyses (June 2023)

**Hospitalization or ED**: Initial VE (84.6%) assumed to persist for 7 months, to decline to 75% at 14 months, and then decline to 0% at 24\textsuperscript{th} month.

**Outpatient**: Initial VE (65.1%) assumed to persist for 7 months, to decline to 55% at 14 months, and then decline to 0% at 24\textsuperscript{th} month.

The pink-shaded area denotes a higher level of uncertainty of the waning assumption beyond available phase 3 data.
UM-CDC: *Updated* assumption on waning of vaccine efficacy per vaccine and outcome

**Hospitalization or ED:** Initial VE (87.5% GSK; 84.6% Pfizer) assumed to persist for 7 months, to drop to 52.9% (GSK), 75% (Pfizer) and remain flat from month 8 to month 18 (GSK) or month 14 (Pfizer), and then decline linearly to 0% at month 24.

**Medically attended** (Outpatient): Initial VE (79% GSK; 65.2% Pfizer) assumed to persist for 7 months, to drop to 27.8% (GSK), 55% (Pfizer) and remain flat from month 8 to month 18 (GSK), month 14 (Pfizer), and then decline linearly to 0% at month 24.

The pink rectangle highlights the difference in duration of protection assumption between vaccines.
Comparison of GSK and Pfizer vaccines: Update base case & scenario $/QALY results using UM-CDC model

<table>
<thead>
<tr>
<th>Scenario</th>
<th>GSK</th>
<th>Pfizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccinating adults aged 60 to &lt;65 years only</td>
<td>$372,656</td>
<td>$218,250</td>
</tr>
<tr>
<td>Lower incidence of RSV(^a) in adults ≥65 years</td>
<td>$276,393</td>
<td>$161,487</td>
</tr>
<tr>
<td>Vaccine cost $340 per dose</td>
<td>$220,864</td>
<td>$187,865</td>
</tr>
<tr>
<td>Vaccinating adults ≥60 years,</td>
<td>$205,638</td>
<td>$118,735</td>
</tr>
<tr>
<td>Residual vaccine protection = 0% at 18 (GSK) or 14 (Pfizer) months</td>
<td>$170,022</td>
<td>$135,886</td>
</tr>
<tr>
<td><strong>Base case(^b)</strong> (Vacc price $270 GSK, $200 Pfizer, adults ≥65yrs)</td>
<td><strong>$167,301</strong></td>
<td><strong>$94,673</strong></td>
</tr>
<tr>
<td>Vaccine cost $180 per dose</td>
<td>$98,485</td>
<td>$81,358</td>
</tr>
<tr>
<td>Higher incidence of RSV(^b) in adults ≥65 years</td>
<td>$84,736</td>
<td>$40,467</td>
</tr>
</tbody>
</table>

\(^a\) Incidence rates: Lower incidence assumes 95% RT-PCR test sensitivity, Higher rate incorporates the upper limit of the 95% CI around the base case incidence rate estimate.

\(^b\) Recommendation = vaccination at age ≥65 years; incidence rates of RSV outcomes upwardly adjust 1.5x to account for incomplete RT-PCR sensitivity on a respiratory specimen (McLaughlin et al; Open Forum Infect Dis 2022); vaccine efficacy only considered for two years post-vaccination
Limitations

• Factors not considered that may result in overestimating the ICER (underestimating the cost-effectiveness) of RSV vaccination
  • All of the 3 models assumed no indirect effects of vaccination (i.e., no protection against RSV transmission)
    Except UM-CDC model
    • Manufacturers models do not include RSV-related medical costs incurred after discharge from an RSV-associated hospitalization or emergency department visit:
      • Stay in long-term care or rehabilitation facility

• Manufacturers models do not include potential vaccine-associated serious adverse events (SAEs)
  • Quality of life impact, resource utilization and costs associated with hypothetical SAEs

• Vaccine efficacy beyond clinical trial follow-up time (beyond 14 months, Pfizer or 18 months, GSK) is unknown
  • All 3 models assumed non-zero declining efficacy beyond 14 or 18 months
Conclusion

• Differences in key inputs among GSK, Pfizer and UM-CDC models explain differences in results:
  • Annual incidence of RSV hospitalization and outpatient disease
  • Initial vaccine (season 1) and waning of protection (VE season 2+)
  • Selection of medical costs sources and data extraction approach

• Resulting ICERs depended heavily on assumptions and selection of input data
  • Annual incidence of RSV Hospitalization
  • Vaccine costs (e.g., increase in GSK vaccine price)

• Base-case in the 3 models:
  • Vaccination would significantly reduce RSV disease burden in older adults
    • VE clinical trials data and assumptions support impact on disease reduction
  • Economic value of RSV vaccines appear to be costly and could be cost-effective
    • RSV incidence, related healthcare costs, initial VE and duration combined with reasonable vaccine price would determine the cost-effectiveness value of RSV vaccination
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