RSV disease burden in older adults

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Summary

- Landscape of the RSV vaccines
- Systematic reviews of RSV Disease burden in older adults
- A RESCEU prospective study in European adults
RSV Vaccine and mAb Snapshot

PRECLINICAL
- Live-Attenuated/Chimeric
  - Blue Lake (FIVs/RSV)
  - Blue Willow Biologicals (FIVs/RSV)
  - University of Virginia (ICG/RSV)
  - St. Jude Hospital (SUPL/RSV)

PHASE 1
- Phase 1: EMD Serono (ICG/RSV)
- Phase 1: Pfizer (FIVs/RSV)
- Phase 1: Moderna (FIVs/RSV)
- Phase 1: Sanofi (FIVs/RSV)

PHASE 2
- Phase 2: MeraVir (Anti-F mAb)
- Phase 2: UCAB (Anti-F mAb)
- Phase 2: Janssen (Elderly)

PHASE 3
- Phase 3: Pfizer (FIVs/RSV)
- Phase 3: Vaxart (FIVs/RSV)
- Phase 3: Moderna (FIVs/RSV)
- Phase 3: Sanofi (FIVs/RSV)

MARKET APPROVED
- Market Approved: Moderna (mRNA)
- Market Approved: Janssen (Elderly)
- Market Approved: Bavarian Nordic (mRNA)

TARGET INDICATION: P = Pediatric, M = Maternal, E = Elderly

UPDated: January 3, 2023

https://www.path.org/resources/rsv-vaccine-and-mab-snapshot/
Global disease burden (systematic reviews)
## RSV disease burdens in two systematic reviews

### RSV-ARI

**Savic 2022**
- **Overall (point estimates, 95% CI)**
  - Attack rate: 1.62% (0.84–3.08)

### RSV hospitalizations

- **Hospitalization rate**: 0.15% (0.09–0.22)

### RSV in-hospital deaths

- **hCFR**: 7.13% (5.40–9.36)

### RSV – ARI incidence

- **Annual studies**: 4.66% (3.34–6.48)
- **Seasonal studies**: 7.80% (5.77–10.45%)

### RSV – case fatality proportion

- **Overall**: 8.8% (5.54–11.94%)
- **High-risk group**: 9.88% (6.66–14.43)
  - **Annual studies**: 7.03% (5.18–9.48%)
  - **Seasonal studies**: 7.69% (6.23–9.46%)
## Comparison among the systematic reviews

<table>
<thead>
<tr>
<th>Study</th>
<th>Age</th>
<th>Adjusted for under-ascertainment</th>
<th>Estimates hospitalisation rate (95% CI) per 100,000</th>
<th>Key study characteristics for comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shi et al 2020</td>
<td>≥ 65 years</td>
<td>No</td>
<td>100 (50-210)</td>
<td>A wide range of case definitions allowed</td>
</tr>
<tr>
<td>Savic 2022</td>
<td>≥ 60 years</td>
<td>No</td>
<td>145 (94-224)</td>
<td>Hospitalisation attack rate (rather than annual hospitalisation rate)</td>
</tr>
<tr>
<td>McLaughlin et al 2022</td>
<td>≥ 65 years</td>
<td>No</td>
<td>178 (152-204)</td>
<td>Limited to the USA; including all RSV-associated hospitalisations; not excluding modelling studies</td>
</tr>
<tr>
<td>McLaughlin et al 2022</td>
<td>≥ 65 years</td>
<td>Partly</td>
<td>267 (228-306)</td>
<td>Limited to the USA; including all RSV-associated hospitalisations; not excluding modelling studies; limited to studies using PCR or serology</td>
</tr>
<tr>
<td>Li et al 2023</td>
<td>≥ 65 years</td>
<td>No</td>
<td>157 (98-252)</td>
<td>Strictly limited to ARI</td>
</tr>
<tr>
<td>Li et al 2023</td>
<td>≥ 65 years</td>
<td>Yes</td>
<td>347 (203-595)</td>
<td>Strictly limited to ARI</td>
</tr>
</tbody>
</table>

After adjusting for diagnostic testing characteristics related to clinical specimens and testing approaches ➔ An estimated 2.2-fold higher disease burden
The older adult (aged ≥60 years) study

Burden of respiratory syncytial virus infection in community-dwelling older adults in Europe (RESCEU): an international prospective cohort study

Koos Korsten, Niels Adriaensens, Samuel Coenen, Christopher Butler, Behzad Ramazani, Heather Rutter, Julie Allen, Ann Fatsery, Jean-Yves Pitsoun, Olivier Guerreau, Vincent Pavot, Charlotte Vennies, Sultah Bello-Hajji, Houshang Tour, Enzi Oner, Gabriella Irapas, Jeroen Aerssens, Vija Shinde, Theo Verheij, Louis Bont, Joanne Wildenbeest on behalf of the RESCEU investigators

European Respiratory Journal 2021 57; 2002986: DOI: 10.1183/13993003.02986-2020

Prospective, observational, cohort study (N=1040)

- 3 European countries & 2 seasons

Objective:

- Estimate average costs and Health-related quality-of-life in older adults (≥60 years) with RSV infection
- Compared RSV to influenza-related costs and HRQoL
Cost per RSV and influenza (non-hospital) episode

The mean [median] and (1st – 3rd quartile) costs per RSV and influenza episode (2020 € value)

<table>
<thead>
<tr>
<th>Perspective</th>
<th>RSV (N=36)</th>
<th>Influenza (N=59)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient</td>
<td>Healthcare provider</td>
</tr>
<tr>
<td>Health care visits</td>
<td>0.78 [0] (0 - 0)</td>
<td>11.74 [0] (0 - 23.06)</td>
</tr>
<tr>
<td>Medication</td>
<td>10.97 [2.7] (0 - 12.2)</td>
<td>2.88 [0] (0 - 0.55)</td>
</tr>
<tr>
<td>Direct cost</td>
<td>11.74 [3.42] (0 - 12.2)</td>
<td>14.62 [0] (0 - 23.22)</td>
</tr>
<tr>
<td>Productivity loss</td>
<td>4.38 [0] (0 - 0)</td>
<td>32.07 [0] (0 - 0)</td>
</tr>
<tr>
<td>Total costs</td>
<td>30.75 [5.54] (0 - 50.02)</td>
<td></td>
</tr>
</tbody>
</table>

Findings:

- The mean costs were lower per RSV episode vs. influenza episode, but interquartile ranges overlapped largely.
- Due to small sample size, no formal statistical comparisons were made.
- Extensive subgroup analyses were performed (e.g. by medically attendance, by country)
Health-related quality-of-life

RSV episodes had higher utility values than influenza episodes at each time point, in other words, quality-of-life impact of RSV seems smaller than for influenza.
Discussion

- The first RSV older adults vaccine is likely to be approved by FDA in Q2 2023
- The burden of RSV disease among older adults is still unclear, and almost unknown in adults including pregnant women
- In order to make a more informed decision, collecting cost and health-related quality-of-life studies are crucial
- Cost-effectiveness of RSV vaccines in older adults need to be carefully evaluated
Thank you!