

# Impact of Maternal Vaccination Strategies on RSV-Related Hospital Burden Among Infants Aged Less Than One Year in France: A Cost-Effectiveness Analysis



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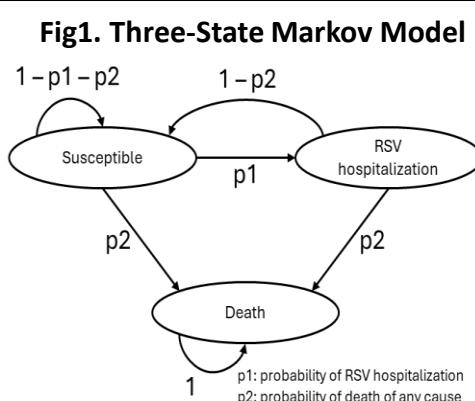
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## BACKGROUND AND OBJECTIVE

- Respiratory syncytial virus (RSV) is the main cause of **severe lower respiratory tract infections (sLRTI)** among infants aged less than 1 year. Nirsevimab and RSV maternal vaccination are the only prophylactic measures currently available in France for the prevention of RSV-related hospitalizations among all infants. French 2024 guidelines recommend RSV maternal vaccination **between 32- and 36-weeks of gestational age (wGA), from September to January** (1-4).
- While **57% of RSV-related hospitalizations** occur during the peak season (Nov–Jan), a notable share also happens **outside this window**, with risk **rising from June**, suggesting the need for a **9-month vaccination strategy**.
- This cost-effectiveness analysis assessed the **impact of this recommendation, and broader strategies, on RSV-related hospital burden reduction in France**.

## METHODS

- A **three-state Markov model** was developed to assess the clinical and economic outcomes of maternal vaccination (Fig1). **Four scenarios** were tested: **no-vaccination, five-months (current recommendation), nine-months (May-January) and year-round (YR) maternal vaccination**.
- We modeled a cohort of **627,499 infants aged less than 1 year** (based on national census) and born to vaccinated or unvaccinated women over one year (5). **MATISSE trial data** were used for medically attended sLRTI vaccine efficacy (VE - 88%) (4). VE waning was 53.9% at 6 months, and 0% at 9 months.
- RSV-related hospitalization inputs** (ICU admissions, length of stay, and costs) were collected from **French real-world hospital database studies** using data from 2016 to 2023. A healthcare payer perspective was adopted.
- Vaccination coverage was assumed at 65% based on pertussis vaccine coverage, with a vaccination cost of €196.1.
- Results were presented as **total cost (hospital + vaccination)** and number **needed to vaccinate (NNV)** to avoid one RSV-related hospitalization. Results were compared to the “no intervention” strategy.



## RESULTS

### Clinical Burden

- Under the currently **recommended strategy**, 159,072 pregnant women (25.4% of the cohort) would be vaccinated, representing €31.2 million in vaccination costs. This number would be 264,507 (42.1%) for **extended strategy** (€51.9 million in vaccination costs), and 396,000 (63.1%) for **year-round strategy** (€77.6 million in vaccination costs).
- In the absence of vaccination, our model estimated **38,625 RSV-related hospitalizations per year**.
- Compared to **no vaccination**, the **recommended strategy** prevented **7,620 (-19.7%) RSV-related hospitalizations and 2,617 (-24.8%) ICU stays** (fig3).
- The **extended strategy** goes further, preventing an **additional 4,111 RSV-related hospitalizations and 1,085 ICU stays**, compared to the currently recommended approach. Importantly, the **extended strategy** offers **better protection for older infants**, with **+16.9% more infants over 6 months avoiding RSV hospitalization**. Impact on infants older than 6 months patients was limited (Fig3).

Fig2. Number of RSV hospitalizations by scenario

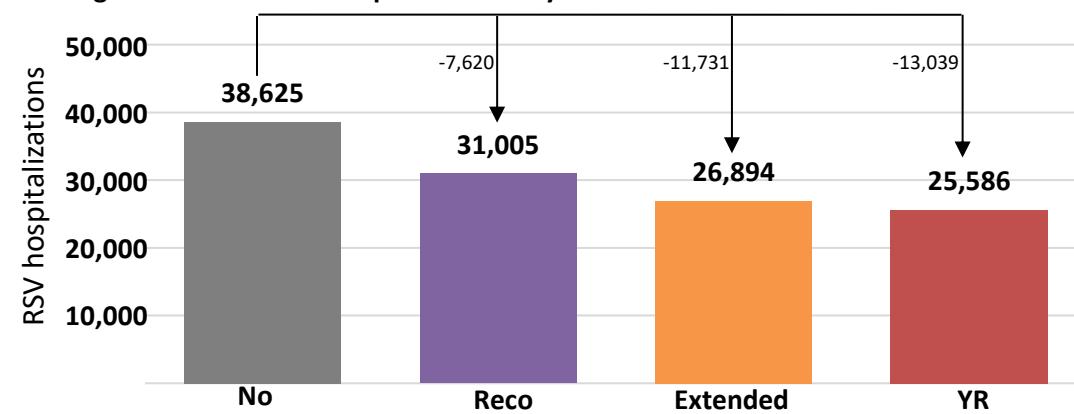
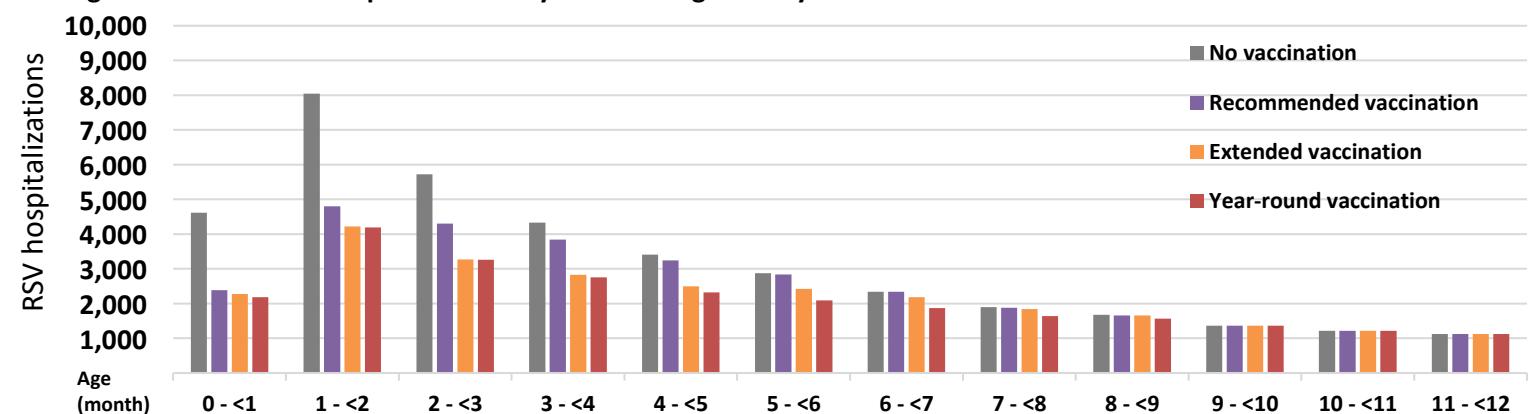


Fig3. Number of RSV hospitalizations by month of age and by scenario



### Economic burden

- Without vaccination, RSV-related hospitalizations cost an estimated **€120 million (M€) annually**.
- The **recommended strategy** reduces **hospital costs by €24.8 million (-20.6%)**, with a total healthcare payer cost of 126.5 M€/year.
- The **extended strategy**, though more expensive overall (134.4 M€/year), **delivers an additional M€12.7 in hospital savings (-13.4%) per year** compared to the recommended strategy.
- The **year-round strategy** achieves the greatest reduction in hospital burden but at the highest cost (156.2 M€/year)

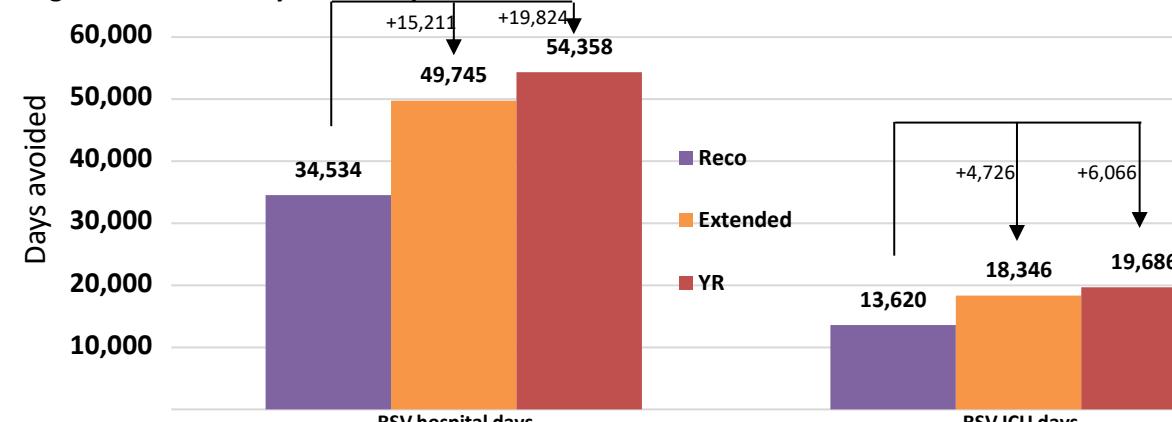
Tab2. Economic impact on RSV hospitalizations – in million €

	Recommended strategy	Extended strategy	Year-round strategy
Hospital costs (€)	€ 95,3M	€ 82,5M	€ 78,6M
Diff vs. no intervention (%)	€ -24,8M (- 20.6%)	€ -37,5M (-31.2%)	€ -41,5M (-34.6%)
Total costs (€)	€ 126,5M	€ 134,4M	€ 156,2M
Diff vs. no intervention (%)	€ 6,4M (+5.4%)	€ 14,4M (+12.0%)	€ 36,2M (+30.1%)
NNV vs no intervention	21	23	30

### Hospital impact

- While the **recommended strategy** alone allows for **saving over 34,000 hospital days and 13,600 ICU days annually**, the **extended strategy** could prevent an additional 15,211 hospital days (49,745 hospital days) and an additional 4,726 ICU days (18,346 ICU days) each year. Compared to the **extended strategy**, the **year-round strategy** avoided an additional 4,613 hospital days (fig4).

Fig4. Annual care days avoided per scenario



## LIMITATIONS

- RSV-related possible long-term sequelae such as child asthma, as well as **RSV-related mortality** were not modeled. Also, **RSV emergency costs, as well as ambulatory direct and indirect costs should also be taken into consideration** to exhaustively depict the impact of vaccination. Potential **maternal benefits of RSV vaccination**, such as a decrease in RSV-related hospitalizations among pregnant women, were not modeled due to the low incidence of RSV sLRTI among young adults. **Organizational impact of RSV vaccination was not directly modeled** in this study. However, the seasonal nature of RSV and other respiratory viruses such as influenza frequently contributes to **hospital overcrowding**, particularly in ERs, infectious disease units, and pediatric ICUs.

## CONCLUSION

- Maternal RSV vaccination strategies in France are expected to drastically decrease the number of RSV-related hospitalizations in infants, ranging from 7,600 stays in the recommended strategy, to more than 13,000 in the year-round strategy. This corresponded to **hospital savings between €24.7 million and €41.5 million**.
- This highlights the added value of broader vaccination strategies in protecting infants who are less covered by seasonal approaches.
- RSV maternal vaccination avoided between 34,000 and 55,000 RSV-related hospitalization days. This substantial reduction in bed occupancy could have a significant impact on hospital organization, helping to alleviate seasonal pressure, optimize resource allocation, and improve care capacity during peak RSV periods.
- Broader vaccination strategies can **further reduce RSV-related hospitalizations at limited additional cost** and can alleviate RSV-related healthcare system strain.

## REFERENCES

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## DISCLOSURES

YF, SF, WG, EB: employees of Pfizer France. RC: Consulting fees from Pfizer, Sanofi, MSD, GSK, Viatris, Cerballiance. Payment for honoraria from Pfizer, MSD, GSK, Sanofi. Payment for expert testimony from Pfizer, MSD. Travel grants from Pfizer, MSD, Sanofi, GSK. Participation to Data Safety Monitoring Board or Advisory Board for Pfizer, Sanofi, MSD, GSK. CL: grants to the institution ACTIV from GSK, Sanofi, Pfizer, and Merck and personal fees and non-financial support from Pfizer and Merck outside the conduct of the study. MN: Consulting fees from Pfizer, research funding from Sanofi. LC, RM: employees of stève consultants – a Cytel company, under research contract with Pfizer France. AL: employee of Pfizer Inc.