Potential benefits of RSV Vaccination in Colombian Adults Aged 60 and Over: A Cost-Utility Analysis.

EE302

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OBJECTIVE

- To evaluate the cost-utility of the RSVpreF vaccine for Colombian adults aged 60 years or older, with a lifetime horizon from the public health system perspective.

METHODS

Model Description

- A population-based cohort model was used to depict the potential impact of introducing RSVpreF vaccination compared to no vaccination, among Colombian adults older than 60 years of age. The model was adapted from the model described by Averin et al. (2025)[1].
- Included outcomes are medically attended RSV cases, deaths associated with RSV hospitalized cases, life years (LYs), quality-adjusted life years (QALYs) and costs.

Model Inputs

- Incidence of RSV hospitalizations was extracted from Burkart et al. (2025)[2] using an average from Argentina, Brazil and Chile. To estimate incidence in Physician office/hospital outpatient (PO/HO) and in the emergency department, the hospitalization rates were adjusted using incidence reported by Buitrago et al. (2025)[3], calculating variations across care settings. Incidence estimates from Buitrago et al. (2025) were not used directly due to the high level of underreporting, acknowledged by the authors as a limitation; however the reported mortality was incorporated. High risk incidence was calculated using relative risks from Weycker et al. (2022)[4].
- General population mortality was obtained from the official life tables published by the National Financial Supervisory Authority[5].
- The model incorporated a detailed set of healthcare costs stratified by age group, risk level, and healthcare setting (outpatient care, emergency department, general ward, and intensive care unit). These unit cost estimates were developed using locally sourced data from Colombian hospitals and validated by clinical experts in infectious diseases, internal medicine, and intensive care.
- Vaccine price was extracted from PAHO revolving fund vaccine price list[6].
- Vaccine efficacy was obtained from the RENOIR randomized controlled trial[7,8], whereas vaccine effectiveness for hospitalization was from the Kaiser Permanente Southern California (KPSC) Study[9].
- A vaccine uptake of 17.8% is set, based on Influenza uptake for Colombian adults in 2018[10] to better reflect real-world population coverage.

Analyses

Base case

- Analyses were conducted from the healthcare system with a lifetime time horizon (life expectancy of 77 years, according to the Colombian Statistics Bureau[11].
- A 5% annual discount rate was applied for costs and outcomes, following national guidelines[12]. The willingness-to-pay (WTP) threshold used was USD 8,266 per QALY gained[13], which is equivalent to 1 GDP per capita.

Sensitivity

- One-way deterministic sensitivity analysis (DSA) and probabilistic sensitivity analysis (PSA) through Monte Carlo simulation were conducted.

RESULTS

Base-case

- Vaccination reduced approximately 2,716 hospitalizations, 157 emergency department visits, and 660 outpatient consultations, avoiding over 3,533 medically attended cases. In addition, the model estimated 155 fewer RSV-related deaths. These clinical benefits translated into 1,403 additional life years and 1,012 quality-adjusted life years (QALYs) (Table 1).
- Savings from healthcare costs were USD 27.1 million, and vaccination costs amounted to $30.04 million. Total costs, including vaccine program costs, were USD 3.56 million.
- The resulting ICER was 3,519 per QALY gained and 2,537 per LY gained. The strategy was cost-effective under the WTP threshold.

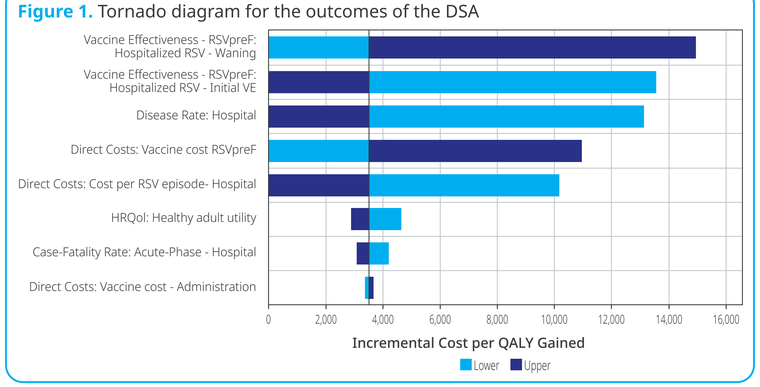
Table 1. Summary of Clinical and Economic Outcomes: Maternal RSVpreF Vaccination vs. No Intervention

Outcome	RSVpreF Vaccination	No Intervention	Difference
Clinical Outcomes			
Total RSV cases	1,357,480	1,361,013	-3,533
Hospitalizations	1,118,099	1,120,815	-2,716
Emergency department visits	6,409	6,565	-157
PO/HO	232,972	233,632	-660
RSV-related deaths	113,747	113,902	-155
Life-years (discounted)	39,795,710	39,794,307	+1,403
QALYs (discounted)	32,390,674	32,389,662	+ 1,012
Economic Outcomes			
Direct medical costs (USD millions)	6,663.61	6,690.70	-27.10
Vaccine program cost (USD, M)	30.66	0	+ 30.66
Total cost (USD, millions)	6,694.26	6,690.70	+ 3.56
ICER			
ICER (USD/LY)			**2,537**
ICER (USD/QALY)			**3,519**

Sensitivity analysis

- Deterministic sensitivity analysis identified vaccine waning and effectiveness, RSV hospitalization rates and vaccine price as key drivers of cost-effectiveness (Figure 1).

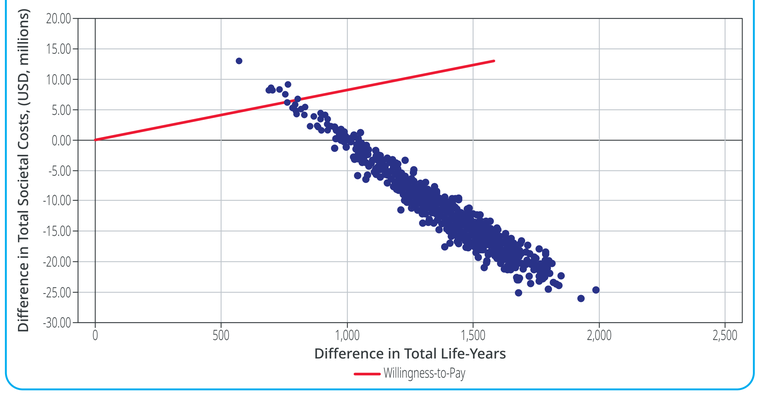
Figure 1. Tornado diagram for the outcomes of the DSA



- Probabilistic sensitivity analysis indicates a high likelihood of cost-effectiveness. This probability is estimated at 99% under the current willingness to pay threshold (Figure 2).

RESULTS (cont)

Figure 2. Cost-effectiveness acceptability curve



LIMITATIONS

- Estimated RSV cases averted from Emergency department visits and PO/HO are lower than expected due to the underestimation acknowledged by Buitrago et al. (2025), who stated that this is mainly driven by low healthcare-seeking behavior in Colombia, limited diagnostic accuracy, and low RSV testing among adults.

CONCLUSION

- Bivalent RSVpreF vaccination is likely a cost-effective intervention that improves health outcomes in Colombian adults aged 60 years and older.
- The RSV vaccination strategy significantly improved health outcomes in the modeled cohort, preventing thousands of RSV-related events and yielding substantial gains in life-years and QALYs.

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