Cost-effectiveness of the Bivalent Respiratory Syncytial Virus Prefusion F (RSVpreF) Vaccine in At-Risk Adults Aged ≥ 60 years in Peru

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Tomas Eduardo Abbott[1], Jazmin Rosario Figueroa[2], Norka Napuri[2], Ali Shajarizadeh[3], Nishu Gaind[3], Luka Ivkovic[3], Gopika Balasubramanian[3], Rengina Kefalogianni[4], Diana Mendes[4]*

[1]Pfizer Value & Evidence SoLA Cluster, Santiago, Chile; [2]Pfizer Medical Affairs SoLA Cluster, Lima, Peru, [3]Evidinno Outcomes Research Inc, Vancouver, BC, Canada; [4]Pfizer Ltd., Tadworth, Surrey, UK

**Rengina.Kefalogianni@pfizer.com*

Background & Objective

- As **Peru's** population ages and chronic conditions become more common among older adults,[1,2] a growing share of the population is vulnerable to severe respiratory infections.
- RSV can cause substantial healthcare use and severe outcomes in older adults, particularly those with underlying chronic or immunocompromising conditions.[3,4]
- The impact of RSV may extend beyond respiratory disease with cardiorespiratory complications contributing to the broader clinical burden in older adults.[5-7]
- **The Peruvian Society of Pneumology supports a single dose of RSV vaccine for adults aged ≥ 60 years at increased risk of RSV disease.**[8] With RSVpreF vaccination now available, country-specific evidence is needed to inform vaccination and resource-allocation decisions.
- **This study evaluated the clinical and economic impact and cost-effectiveness of RSVpreF vaccination vs no vaccination in at-risk Peruvian adults aged 60–99 years.**

Methods

A population-based Markov cohort model was used to project clinical and economic outcomes of RSVpreF vaccination vs. no vaccination

Population	• Peruvian adults aged 60-99 years at-risk of RSV illness (n = 1,914,443)
Clinical outcomes	• Medically attended RSV cases by care setting including hospitalisations (H), emergency department (ED), and physician office (PO) encounters • RSV-related deaths among hospitalised cases • Life years (LYs) • Quality-adjusted life years (QALYs)
Economic outcomes	• RSVpreF and vaccination administration costs • Direct medical care costs

Model inputs	Description & Source
Population & risk stratification	The 2025 Peruvian population was stratified by age and RSV risk status, with base case population comprising **at-risk adults aged 60-99 years**. Age-specific risk distributions were derived from Peru-specific comorbidity data.[9,10]
RSV epidemiology	Peru-specific annual RSV cardiorespiratory hospitalization (RSV-H) rates were obtained from Burkart et al. (2026),[11] while RSV-ED and RSV-PO rates were obtained from Li et al. (2025).[12] Rates were stratified by risk using published US (United States) relative rates.[13] For at-risk adults aged 60-99 years, resulting derived annual rates were **RSV-H: 193.5/100,000, RSV-ED: 1020.3/100,000, and RSV-PO: 5636.3/100,000**. Distribution of RSV cases by calendar month were obtained from the Peruvian Ministry of Health (MoH).[14]
General mortality	Age-specific all-cause mortality rates were derived from 2024 Peruvian MoH **registered deaths data**.[14] Relative mortality ratio of 1.75 was assumed.[15]
RSV case fatality rate (CFR)	In the absence of Peru-specific data, an RSV-related **CFR of 8.56% (for ≥ 65 years)** from a systematic review of RSV burden in developed countries was used,[3] and distributed across age and risk groups using US pneumonia-related mortality relative rates.[16]
Vaccine effectiveness (VE)	VE against RSV-H and RSV-ED was based on **KPSC 2-season real-world study data** in adults ≥60 years.[17] VE against RSV-PO was based on **RENOIR** trial efficacy data.[18]
Vaccine uptake	A vaccine uptake of **61%** was based on 2025 influenza vaccination coverage among Peruvian adults ≥60 years from Peruvian MoH.[14] Uptake was distributed equally from April to December.[19]
Direct medical care costs (US$ and Peruvian Soles [S/])	Per-episode costs for at-risk adults were estimated via expert-informed micro-costing and local Ministry of Health tariffs (data unpublished). Costs were **US$5,024** (**S/17,921**) for **RSV-H**, **US$196** (**S/700**) for **RSV-ED**, and **US$50** (**S/177**) for **RSV-PO**.[20]
Vaccination cost	**RSVpreF vaccine cost** was **US$49 (S/175) per dose**, as per **PAHO Revolving Fund** (Pan American Health Organisation).[21] **Vaccine administration cost** of **US$4 (S/14) per dose** was assumed.[22]
Utility	Baseline utilities were estimated using **Chilean EQ-5D-3L** health-state profiles mapped to EQ-5D-5L and **Peru-specific preference weights**; composite time trade-off (cTTO)-derived values were used in the base case.[23-25]
Disutility	Acute RSV-related QALY losses were **0.0167 per RSV-H** and **0.0054 per RSV-ED/PO encounter**.[26,27]

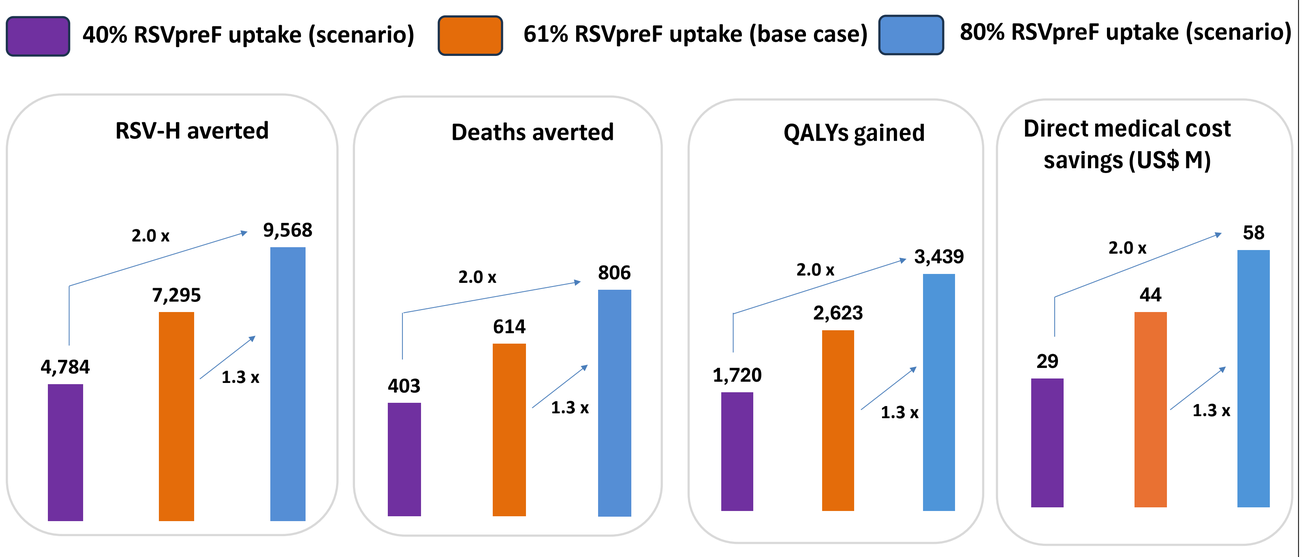
Model settings & analyses		
Healthcare perspective	**Lifetime horizon**	**3% discounting for costs and outcomes[28]**
Willingness-to-pay: US$7,011 (S/25,007) per QALY gained; Peruvian MoH[29]		

Base case analysis results

	RSVpreF Vaccination	No Vaccination	Difference
Clinical outcomes			
Total no. of medically attended cases	2,034,378	2,156,627	**-122,250**
RSV-H cases	73,140	80,435	**-7,295**
RSV-ED cases	308,451	343,423	**-34,972**
RSV-PO cases	1,652,786	1,732,769	**-79,982**
RSV-related deaths	6,751	7,365	**-614**
LYs (discounted)	21,262,418	21,257,987	**4,431**
QALYs (discounted)	10,501,005	10,498,383	**2,623**
Economic outcomes US$ (S/) in millions [M]			
Medical care	357 (1,275)	401 (1,432)	**-44 (-157)**
Vaccination costs	61 (218)	0	**61 (218)**
Total direct costs	419 (1,493)	401 (1,432)	**17 (61)**
Healthcare perspective ICER - cost per QALY gained US$ (S/)			**6,567 (23,425)**

- ✓ Under the **61% base case vaccine uptake**, 1,167,810 individuals were projected to be vaccinated with RSVpreF. RSVpreF vaccination prevented **122,250 medically attended RSV cases** over the cohort lifetime, including **7,295 H, 34,972 ED encounters, and 79,982 PO encounters**.
- ✓ RSVpreF vaccination was associated with **614 fewer RSV-related deaths, 4,431 additional discounted LYs**, and a **gain of 2,623 discounted QALYs** versus no vaccination.
- ✓ Although RSVpreF vaccination was estimated to require **US$61 M (S/ 218 M)** in programme costs, these were partially offset by **US$44 M (S/ 157 M) in avoided RSV-related medical care costs**, resulting in an **incremental cost of US$17 M (S/ 61 M)**.
- ✓ The resulting incremental cost-effectiveness ratio (ICER) of **US$6,567 (S/23,425) per QALY gained** was below the Peruvian MoH threshold of **US$7,011 (S/25,007) per QALY gained**,[22] supporting RSVpreF vaccination as a **cost-effective strategy** compared with no vaccination.
- ✓ **Including productivity losses** reduced the incremental cost to **US$1.4 M (S/5.0 M),** with **US$15.8 M (S/56.5 M)** in **indirect cost savings**, resulting in a societal perspective **ICER of US$529 (S/1,889) per QALY gained**, much below the MoH threshold.

Scenario analysis: impact of alternative RSVpreF uptake



Scenario analysis tested the public health and economic impact of alternative **RSVpreF uptake of 40% and 80%.** Increasing uptake from the base case of 61% to 80% increased RSV-H and RSV-related deaths averted, QALYs gained, and direct medical cost savings by approximately **1.3-fold**. Compared with 40% uptake, 80% uptake resulted in approximately **2.0-fold** more RSV-H cases and RSV-related deaths averted, QALYs gained, and direct medical cost savings. These findings highlight the importance of vaccine coverage in maximizing the overall **health and economic benefits** of RSVpreF vaccination among **at-risk older adults in Peru**.

Conclusion

- **RSVpreF vaccination of adults aged 60–99 years at increased risk** of RSV disease **is likely to be cost-effective in Peru**, with the potential to **substantially reduce RSV-related morbidity** and **mortality**. These findings support consideration of targeted RSVpreF vaccination within Peru's adult immunization strategy.
- **Higher RSVpreF vaccine uptake** increased the overall **health and economic benefits**, highlighting the importance of achieving **high coverage** to maximize the benefits of vaccination.

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