

Unlocking the Value of RSV Adult Vaccination with Adjuvanted RSVPreF3 Vaccine in Spain: a Return on Investment Analysis Using an Integrated Actuarial-Macroeconomic Model

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Respiratory syncytial virus vaccination in Spain is a **cost-saving public health intervention**: every €1 spent on vaccinating people aged 60 and older, society gains at least €4.00 through **health and broader economic benefits**.



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Background

- Respiratory syncytial virus (RSV) is a leading cause of lower respiratory tract infection (LRTD) in older adults, especially those with underlying health conditions.^{1,2}
- Besides imposing a substantial burden on the Spanish healthcare system, RSV contributes to a diminished quality of life for patients, and to productivity losses for the entire economy.³
- Vaccination programs present an effective strategy to alleviate RSV burden. Thus, economic evaluation is essential to adequately inform policies and their implementation.



An actuarial model was adapted to the Spanish context, with projection of RSV impact on productivity. We aimed to measure, through modelling, the return on investment (ROI) of adjuvanted RSVPreF3 vaccination in Spain, considering: **Healthcare cost savings**; **Averted productive output loss** (gross domestic product [GDP] loss); **Averted monetized quality-adjusted life-year (QALY) loss**; **Deadweight loss**.

Demographics



Population: One-time vaccination of adults aged ≥60 years for 5 years⁴



Vaccination coverage: 60–64 years: 62%
≥65 years: 75%

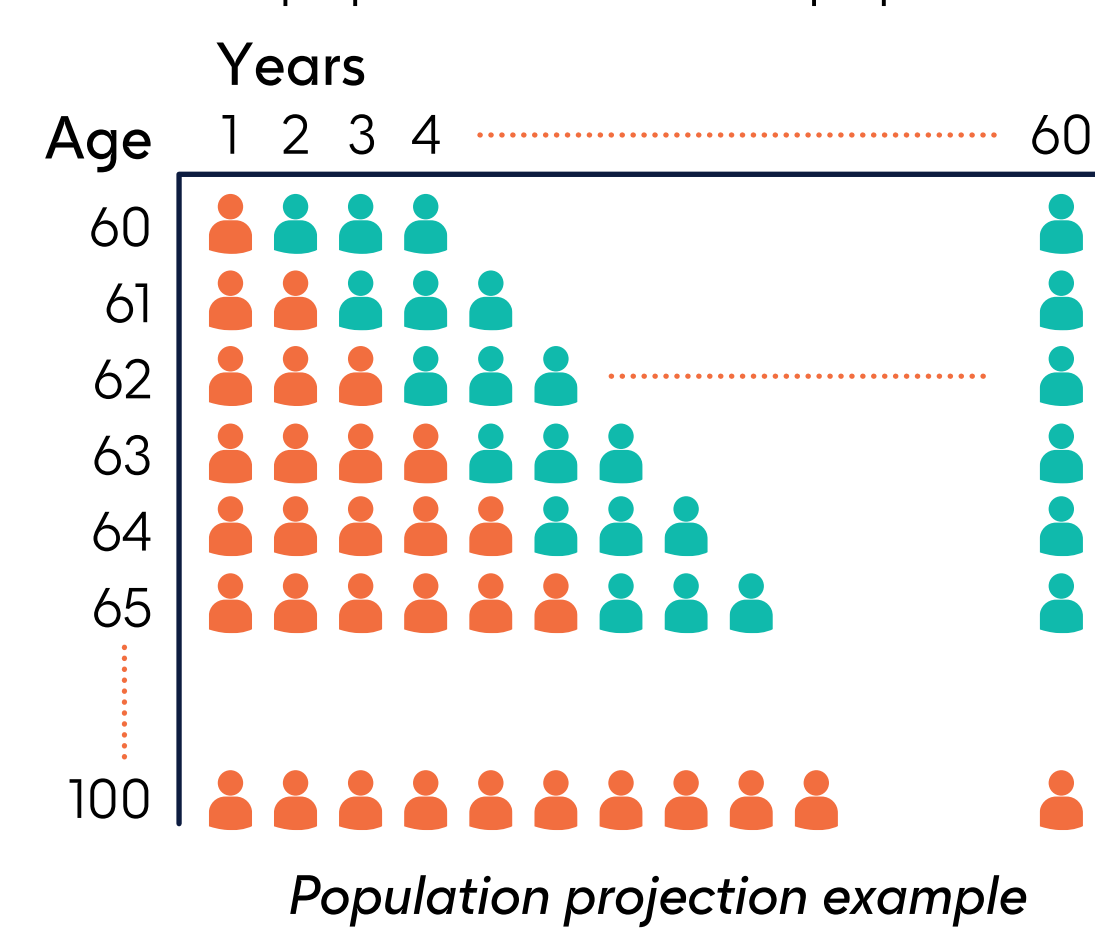


Time horizon: 10 years follow-up (outcomes) / lifetime (QALYs)



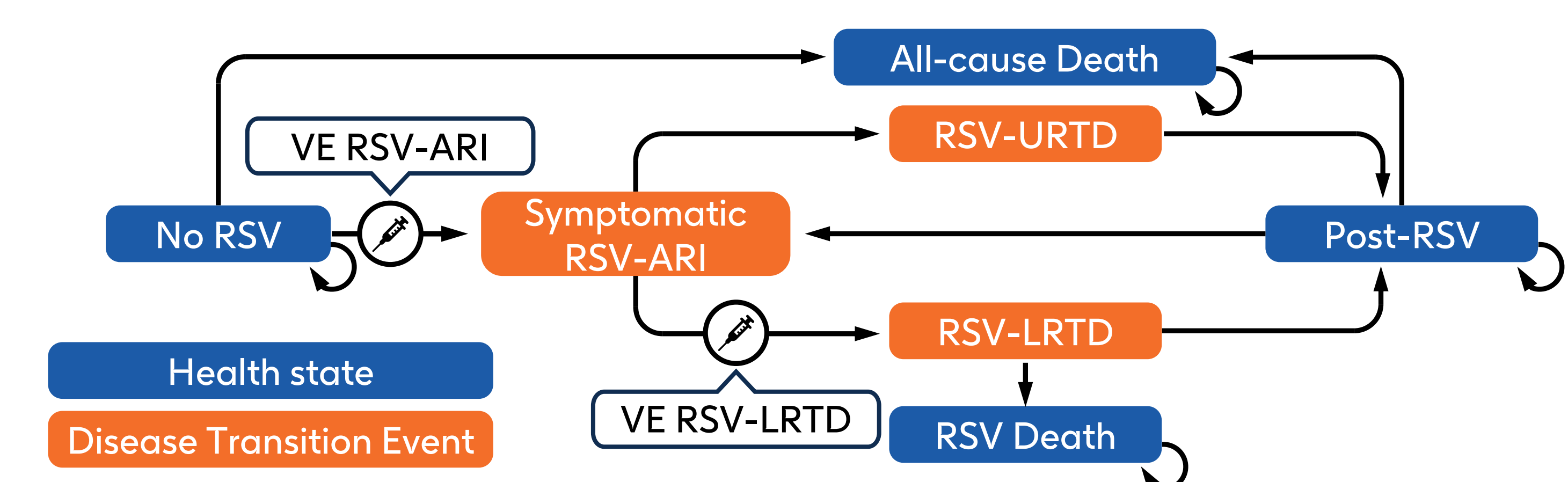
Discount rate: 3% Costs and QALYs

Initial population New population

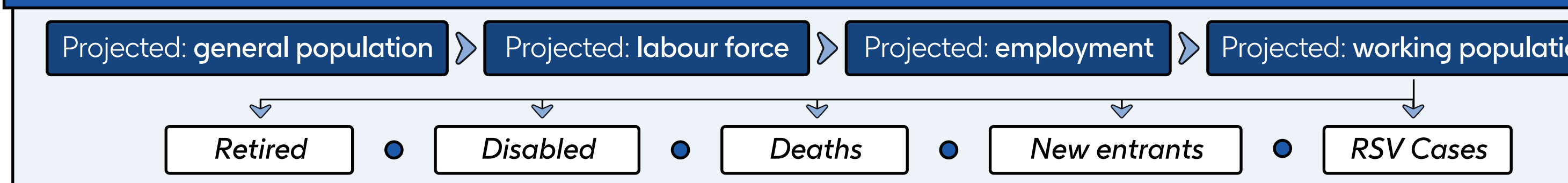


Study design

Disease simulation model⁴ to assess health benefits and healthcare cost savings with vaccination



Actuarial framework to project age-specific disease incidence, healthcare resource use, and costs⁵



Productivity loss component (impact of RSV-attributed productivity loss on GDP)

GDP loss was estimated using the **Cobb-Douglas production function**,⁶ typically expressed as $Y=A \cdot K^{\alpha} \cdot L^{\beta}$

$$\text{GDP Loss} = \frac{\text{Work Hours Loss (t)} \times \beta \times Y_h}{\text{Total Work Hours (t)}}$$

Y: total output (i.e., GDP); A: total factor productivity reflecting efficiency in the use of capital (K) and labour (L) which is measured in terms of total hours worked; α , β : output elasticities of capital and labour; Y_h : GDP per workhour.

Deadweight loss

The **economic cost**, associated with raising **additional tax revenue** to compensate for the loss of government revenue caused by reduced productivity.

Vaccination benefits (monetised QALYs)

Valued at 1x GDP per capita (i.e., €33,100)⁷ per QALY gained

Cost-benefit analysis (CBA)

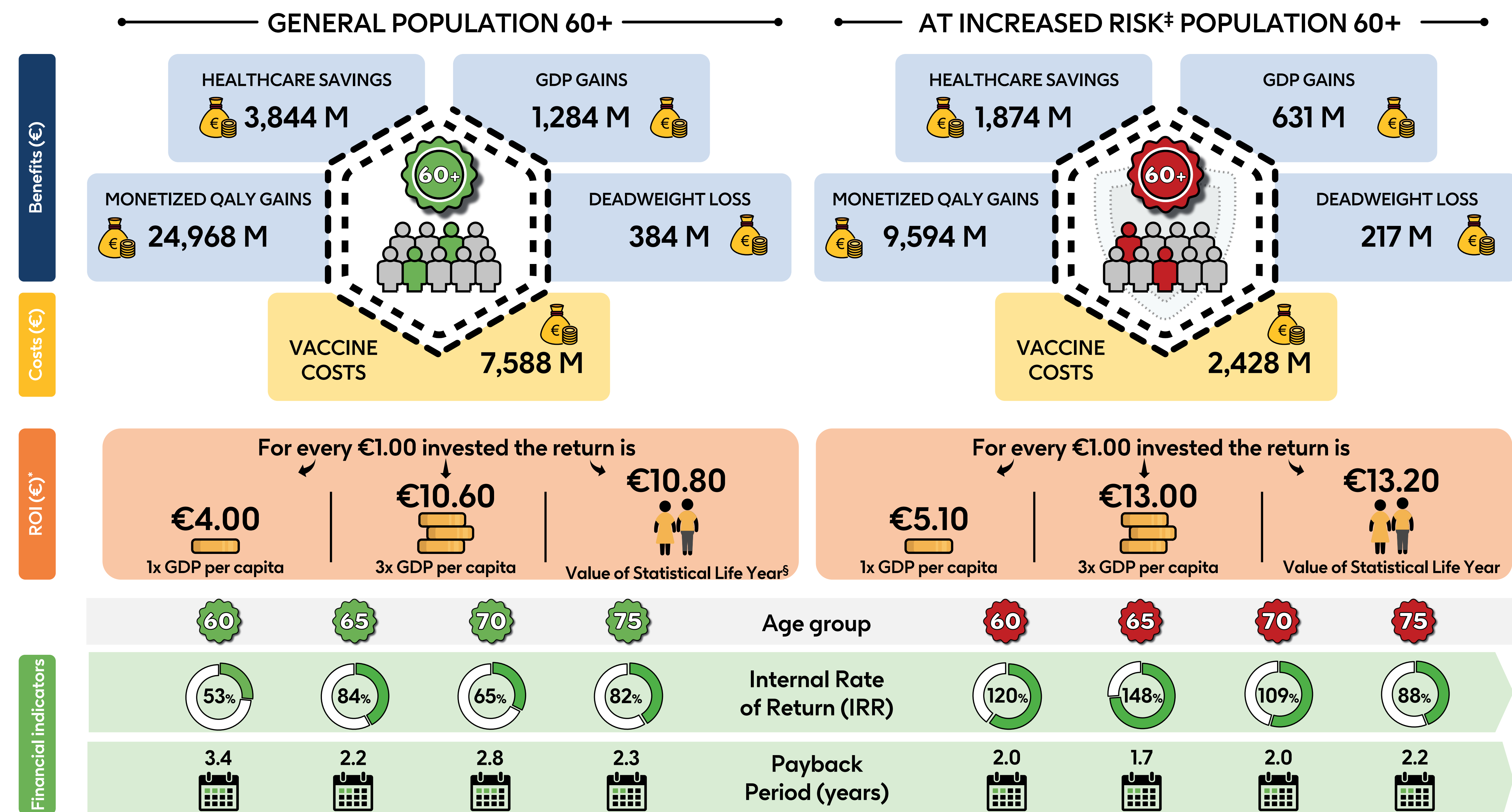
The CBA generated a ROI: to compare vaccination economic gains (averted losses) with the costs of vaccination

$$\text{ROI} = \frac{\Delta(\text{PV Broader Economic Loss}) + \Delta(\text{PV Health Related Loss}) + \Delta(\text{Monetised QALYs})}{\Delta(\text{Vaccine Costs})}$$

PV: Present value; Δ : Difference between vaccinated and unvaccinated cohorts

Results

Key Messages



In both **populations** vaccination delivers **substantial societal and economic value** through monetized QALYs, healthcare savings, GDP gains, and reduced deadweight loss.

The vaccine program's costs are **outweighed** by substantial financial and healthcare benefits.

Every **€1 invested** in RSV vaccination delivers between **€4.00** and **€13.20** in value to society.

Investing in RSV vaccination offers an attractive return profile, delivering an IRR of **53%–148%** and full capital recovery in **1.7–3.4 years**.

Conclusions



A vaccination program with the **adjuvanted RSVPreF3 vaccine** for adults aged 60 and older—across both increased risk and general populations—would constitute a **high-value public health investment** in Spain, yielding positive returns.



The results support informed decisions on public investment in RSV immunization as a **cost-saving strategy** that delivers both **substantial health benefits** and **broader economic gains**.

*Data updated post-abstract submission. ^aAssuming a higher risk of hospitalization due to a baseline condition. ^bThe value of a statistical life year (VSLY) measures how much society is willing to pay to gain one extra year of life expectancy for an individual. The VSLY used here is based on Australian reference values adjusted for purchasing power parity to reflect Spanish economic conditions.⁸

Abbreviations

ARI: acute respiratory infection; CBA: cost-benefit analysis; GDP: gross domestic product; IRR: internal rate of return; LRTD: lower respiratory tract infection; M: million; QALY: quality-adjusted life year; ROI: return on investment; RSV: respiratory syncytial virus; URTD: upper respiratory tract infection; VE: vaccine efficacy.

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