

COST-UTILITY ANALYSIS OF PNEUMOCOCCAL VACCINATION WITH PCV13 VERSUS PPSV23 IN ADULTS OVER 18 YEARS OLD IN CHILE*

Autores:

Biagini L., Rojas R., Fuentealba F., Pezzani M. - Escuela de Salud Pública, Facultad de Medicina, Universidad Mayor

ECONOMIC EVALUATION; COST/UTILITY

INTRODUCTION: Pneumococcal infections are a public health concern, especially among older adults and those with underlying comorbid or immunocompromising conditions. In Chile there are currently two pneumococcal vaccines, Pneumococcal Polysaccharide Vaccine 23-valent (PPSV23) and Pneumococcal Conjugated Vaccine 13-valent (PCV13). Though less expensive, PPSV23 is thought to elicit a less robust immune response and have limited effectiveness against non-bacteremic pneumococcal pneumonia.

OBJECTIVE

The objective of this study was to determine the cost-effectiveness of a PCV13 vaccination program versus a PPSV23 program in the Chilean Health System among high risk adults aged 18 years and older (with assumed coverage of 100% in high risk patients and assumed coverage of 90% in healthy adults 65 years old and older) in the Chilean Health System.

METHOD

A cost-utility study was performed using a Markov model (population data for a time horizon of 10 years) [Figure 1]. Utilities and epidemiological data like incidence, mortality, and consequences of pneumococcal disease were obtained from Chilean, Latin American and International published literature. Vaccine efficacy estimates were taken from literature for PPSV23 and from the Community-Acquired Pneumonia Immunization Trial in Adults (CAPITA) for PCV13. Direct and indirect costs were obtained from FONASA, the Chilean Public Health Insurance. Cost were measured in Chilean pesos (CLP) but are released in US\$ (exchange rate: 1US\$= 600 Chilean pesos). The price for each vaccine was taken from National Supply Center (CENABAST) for 2014:

- PPSV23: US\$ 5.37
- PCV13: US\$ 15.68

Vaccine costs and quality-adjusted life of years (QALYs) were determined and compared.

RESULTS

With a PCV13 vaccination program, 107 cases of bacteremia, 13 of meningitis, 6,706 of inpatient pneumonia, 4,509 of outpatient pneumonia and 1,189 deaths were avoided compared with PPSV23 program.

Over the 10 year period studied, and for the total population of 12,773,697 people, the Incremental Cost/Effectiveness Ratio (ICER) was dominant for PCV13, and these results did not vary with sensitivity analysis on high impact variables (Tables N° 1 and Figure N°2).

CONCLUSION

A PCV13 vaccination program is dominant over a PPSV23 program. An immunization program with PCV13 would not only save public health expenses but also reduce morbidity and mortality in Chilean adults over 18 years old. These results were robust under a variety of sensitivity analysis.

MODEL

Figure 1: Model Schematic

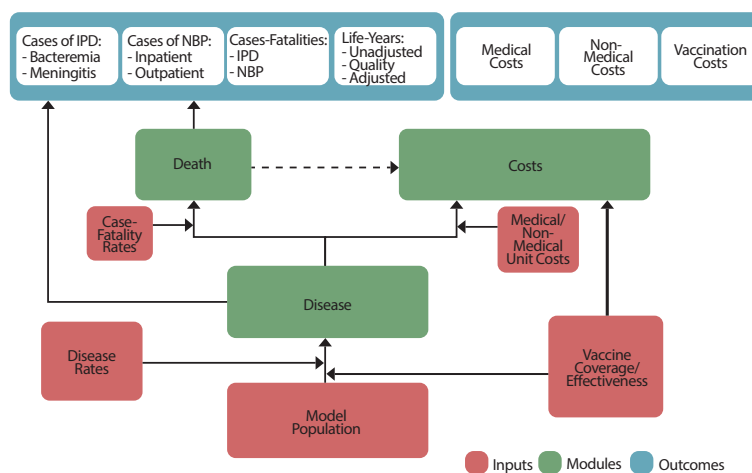


Table 1: Incremental Analysis

Strategy	Cost (\$)	Efectiveness (QALYs)	Δ Cost (\$)	Δ Efectiveness (QALYs)	ICER (\$/QALY)
PPSV23	2,026,510	11,479,124			
PCV13	1,994,404	11,484,554	-32,106	5,430	-5.91

ICER: Incremental Cost Effectiveness Ratio

Tabla 2: Variables used in the Sensitivity Analysis and Corresponding Statistical Distribution

Variable	Statistical Distribution
Incidence Rate	Beta
Indirect Effects	Uniform
Efectiveness	Beta
Utility	Uniform
Mortality	Beta
Direct Costs	Log Normal
Indirect Costs	Log Normal

Figure 2: Sensitivity Analysis

