

# Cost-effectiveness evidence – a case study

This document is intended to support immunization programme managers and staff in their efforts to secure sustainable funding for immunization.

## HOW TO USE THIS DOCUMENT

It is important that decision-makers and partners appreciate the importance of immunization, not just as a public health intervention but as a national investment that yields socioeconomic returns and health care savings.

This document presents summaries and key findings from a cost-effectiveness study. It is one of ten such studies drawn from evidence published in peer-reviewed journals and official documentation. The summaries can be drawn upon to support your

country's efforts to raise the profile of immunization and ensure continued investment in it within the context of health care prioritization.

**Use the summaries as inspiration, to prepare for a meeting or to hand out to stakeholders.**

The case studies will help most when they are used to help paint a national picture and a strong country-specific case for continued support in immunization. Present the studies alongside descriptions of the national issues and challenges. If available, supplement them with your own national data. If the same data is not available, consider using other national data that can serve as a proxy.



# Cost-effectiveness evidence for the introduction of a vaccine

## Case Study: Croatia – PCV<sup>1</sup>

### KEY FINDINGS

A cost-effectiveness study on the introduction of Pneumococcal Conjugate Vaccine (PCV) was conducted in Croatia. Key findings included the following.

Pneumococcal vaccination in children aged less than 5 years in Croatia in the period 2014–2033 was predicted to:

- prevent 36 000 episodes of pneumococcal illness;
- prevent 3650 outpatient visits, 100 hospital admissions and 1 death each year;
- reduce by 50–60% incidence of pneumococcal meningitis and the number of children with long term disabilities due to meningitis;
- reduce health service expenditure for treating pneumococcal illnesses by US\$ 6–7 million;
- cost the government US\$ 50–55 million to introduce;
- be potentially cost-effective at vaccine price less than US\$ 20 per dose.

## Methods

PCV10 and PCV13 were compared to a scenario assuming no vaccination for 20 birth cohorts of children over the period 2014–2033 using a static cohort model (TRIVAC).

Input parameters included:

- demography and disease burden
- health service utilization and costs
- vaccination coverage and efficacy
- vaccination cost.

## About *Streptococcus pneumoniae*

These bacteria cause a wide range of diseases including meningitis, pneumonia, sinusitis and otitis media.

Worldwide, about 14.5 million episodes of serious pneumococcal disease occur each year, and it is the most important cause of vaccine-preventable deaths in children younger than 5 years.

The two available pneumococcal conjugate vaccines (PCV), PCV10 and PCV13, target either 10 or 13 of the most prevalent serotypes respectively, which cause over 70% of serious pneumococcal disease in children.

<sup>1</sup> Višekruna Vuđina V, Kuređiđ Filipoviđ S, Kožnjak N, Stameniđ V, Clark A, Mounaud B, Blau J, Hoestlandt C, Kaiđ B. Cost-effectiveness of pneumococcal conjugate vaccination in Croatia.

## Results

### Health benefits

- Each year, in children less than 5 years of age either vaccine is estimated to prevent about:
  - 1800 pneumococcal cases
  - 100 hospital admissions
  - 1 death

Table 1. Discounted health benefits (20 cohorts vaccinated over the period 2014–2033)

HEALTH OUTCOME	NO VACCINE	NUMBER OF CASES AVERTED	
		PCV 10	PCV 13
Pneumococcal cases in children less than 5 years	680 474	36 348	36 931
Outpatient visits	1 360 359	72 381	73 497
Inpatient admissions	3 365	1 808	2 086
Deaths < 5 years	27	15	17
Children with permanent disability	15	8	9
DALYs Lost	1 297	559	643

### Economic benefits

For the period 2014–2033, about 600 disability-adjusted life years (DALYs) would be prevented

Over 20 years, either vaccine would avert costs amounting to approximately:

- US\$ 6–7 million (government perspective)
- US\$ 10–11 million (societal perspective).

The cost per DALY averted would be US\$ 69 000–77 000. In Croatia, 3 x GDP per capita (i.e. the WHO-recommended cost-effectiveness threshold) is around US\$ 40 000, therefore routine vaccination with PCV in Croatia is **unlikely to be cost-effective** unless:

- the vaccine is priced at US\$ 20 per dose or less;
- the disease burden is higher than estimated;
- the burden of pneumococcal disease in older age groups is considered.

Figure 1. US\$ per DALY averted for PCV10 with variable input parameters

