

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 introducing and sustaining a vaccine

Case study: Italy – Hepatitis B¹

KEY FINDINGS

An economic evaluation of the clinical impact of hepatitis B immunization in the 20 years following its introduction in Italy in 1991 was conducted. Key findings included the following.

- The first 20 years of the hepatitis B vaccination programme resulted in:
 - **reduced burden** of hepatitis B virus (HBV) related diseases;
 - return on investment of 1.02 from the National Health Service (NHS) perspective;
 - clinical **savings exceeding** vaccination **costs** in 2010

Italy context

1980s

- 11 000 symptomatic cases of acute viral hepatitis per year (incidence rate 19/100 000).
- 64 000 affected by chronic viral hepatitis or cirrhosis.
- 3 400 affected by hepatocellular carcinoma.

1991

- Italy introduced a programme of routine immunization against HBV.
- Immunization of all newborns within their first years of life.
- Immunization of 12-year-olds during the first 12 years of the programme.
- HBV incidence rate declined to 5/100 000 due to behaviour changes and improved health care procedures.

2010

- HBV incidence rate decreased to 0.9/100 000.

About hepatitis B

Approximately 2 billion people worldwide have been infected with HBV. Of the 360 million people chronically infected, 600 000 die each year from HBV-associated liver cirrhosis or hepatocellular carcinoma.

In endemic areas, HBV transmission mainly occurs perinatally or during early childhood. However, in low endemic areas, transmission mainly occurs later in life through sexual contact or through the use of contaminated needles.

Methods

The authors used a mathematical simulation model to conduct an economic evaluation of the clinical impact of hepatitis B immunization in the 20 years following its introduction in Italy. The authors also projected future benefits that could be expected to be delivered by the programme.

¹ Boccalini S, Taddei C, Ceccherini V, Bechini A, Levi M, Bartolozzi D, Bonanni P. Economic analysis of the first 20 years of universal hepatitis B vaccination program in Italy: An a posteriori evaluation and forecast of future benefits. *Human Vaccines & Immuno-therapeutics*. May 2013, 9(5): 1119-1128.

Results

- The study found that hepatitis B incidence declined between 1990 and 2010 by:
 - 100% among children aged 0–14 years
 - 97% among teenagers and adults aged 15–24 years
 - 70% among adults older than 24 years of age
 - 82% in the total population.
- Benefit-to-cost ratio was 0.91 from the societal perspective for the period 1991–2010, and predicted to be 2.47 for the period 1991–2059.
- Projections for 2011–2059 estimated a 77% reduction of costs, from the both the NHS and societal perspectives.

From the NHS perspective, the break-even point was achieved in approximately 2010. Therefore, benefits of the immunization programme will continue to become more evident in the future.

The impact of the immunization programme was far reaching, affecting all age groups within the Italian population.

Figure 1. Cumulative clinical savings and vaccination costs from the NHS perspective during the period 1991–2010

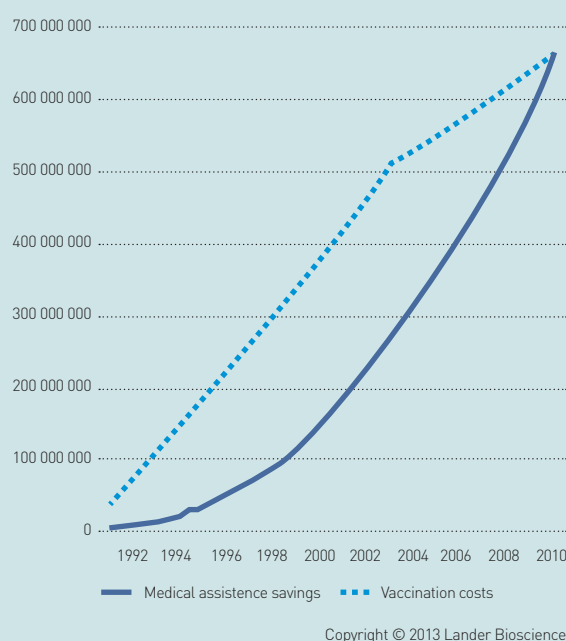


Table 1. Total number of cases related to HBV infection in Italy during the 1991–2010 period in the vaccination and no vaccination scenario

CLINICAL CASES	NO VACCINATION	VACCINATION	AVOIDED CASES	% REDUCTION
HBV infection	168 930	42 038	126 892	75
Symptomatic acute HBV infection	43 140	28 520	14 621	34
Chronic hepatitis B	5 465	1 360	4 105	75
Compensated cirrhosis	129	59	70	54
Decompensated cirrhosis	9	4	5	54
Hepatocellular carcinoma	86	22	64	74
Liver transplantation	24	7	17	72

Table 2. Clinical costs during the 1991–2010 period from the NHS perspective in the vaccination and no vaccination scenarios

CLINICAL COSTS (1991–2010)	NHS PERSPECTIVE			
	NO VACCINATION	VACCINATION	AVOIDED CASES	% REDUCTION
Symptomatic acute HBV infection	572 051 723	362 160 953	209 890 771	37
Chronic hepatitis B	649 157 949	210 059 569	439 098 380	68
Compensated cirrhosis	18 485 689	8 914 521	9 571 168	52
Decompensated cirrhosis	1 193 807	575 700	618 107	52
Hepatocellular carcinoma	8 330 359	2 830 361	5 499 999	66
Liver transplantation	3 135 545	1 117 773	2 017 771	64
Total	1 252 355 072	585 658 877	666 696 195	53