

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: Belarus and Uzbekistan – *Haemophilus influenzae* type B¹

KEY FINDINGS

A comparative economic evaluation of *Haemophilus influenzae* type b (Hib) vaccination in Belarus and Uzbekistan was conducted to guide decision-makers on whether:

- Belarus should expand current regional Hib vaccination countrywide;
 - Uzbekistan should continue Hib vaccination following termination of funding from the GAVI Alliance in 2015.
- Key findings included the following.

Hib vaccination for one birth cohort is predicted to:

- prevent about **350** deaths and **3000** Hib disease cases **annually** in children less than 5 years of age in Uzbekistan;
- prevent about **3** deaths and **500** Hib disease cases **annually** in children less than 5 years of age in Belarus;
- **reduce** by **80%** treatment costs for Hib (outpatient visits and inpatient admissions) in both countries;
- **reduce** by **80%** the number of children with long-term disabilities due to Hib meningitis.
- increase immunization costs per fully vaccinated child to **US\$ 43** and **US\$ 16** in Belarus and Uzbekistan respectively.

Methods

A decision analytic model was used to predict the impact of Hib vaccination for the 2009 birth cohort in Belarus and Uzbekistan.

Input parameters included:

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

About *Haemophilus influenzae* type B

Hib is the most common cause of serious infection and mortality in children under 5 years of age in industrialized countries that do not include Hib vaccination in their routine immunization schedules.

Hib often presents as meningitis, epiglottitis, pneumonia, septic arthritis or osteomyelitis.

Hib is frequently associated with severe neurologic sequelae, even if antibiotics are given promptly.

Vaccines are the only public health tool that can prevent most cases of serious Hib disease.

¹ Griffiths UK, Clark A, Shimanovich V, Glinskaya I, Tursunova D, Kim L, et al. (2011) Comparative Economic Evaluation of *Haemophilus influenzae* Type b Vaccination in Belarus and Uzbekistan. PLoS ONE 6(6): e21472. doi:10.1371/journal.pone.0021472.

Results

Health impact

Hib vaccination is predicted to:

- prevent 3002 cases of Hib disease for the 2009 birth cohort in Uzbekistan and 467 cases in Belarus;
- reduce under-five mortality by 1.1% and 0.3% in Uzbekistan and Belarus respectively.

Cost-effectiveness

- The cost per discounted disability-adjusted life-year (DALY) averted was calculated to be US\$ 9323 in Belarus and US\$ 267 in Uzbekistan, making Hib vaccination cost-effective and highly cost-effective respectively.
- Hib vaccination is more cost-effective in Uzbekistan mainly due to the country's:
 - higher baseline Hib mortality burden
 - lower price of vaccine.

Table 1. Discounted health and economic impact for 2009 birth cohort (0-59 months)

| | BELARUS | UZBEKISTAN |
|--|--------------|------------|
| Hib disease cases averted | 467 | 3 002 |
| Hib deaths averted | 3 | 334 |
| Hib meningitis sequelae cases averted | 4 | 33 |
| DALYs averted | 152 | 11 473 |
| Annual incremental vaccine costs (US\$) | 1 764 322 | 4 241 611 |
| Treatment costs averted (US\$) | 343 740 | 1 183 681 |
| Annual net costs (US\$) | 1 420 582 | 3 057 930 |
| Incremental costs per DALY averted (US\$) | 9 323 | 267 |

Table 2. Cost-effectiveness

| | BELARUS | UZBEKISTAN |
|---|----------------|-----------------------|
| Cost per discounted DALY averted (US\$) | \$9 323 | \$267 |
| GDP per capita (US\$) | \$5 560 | \$1 100 |
| Cost-Effectiveness (WHO Criteria) | Cost-effective | Highly cost-effective |