

Vaccine delivery costing to support decision-making

Karene Yeung

yeungh@who.int

Consultant

Raymond Hutubessy

hutubessyr@who.int

Team lead

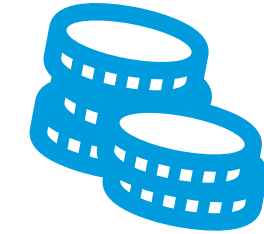
Value of Vaccines, Modelling and Economics Team
Immunization Analysis and Insights Unit
Department of Immunization, Vaccines and Biologicals
World Health Organization



Outline

1. Vaccine delivery cost: WHAT, HOW, WHY, WHEN
2. Major types of vaccine delivery costing
3. Costing for new vaccines: examples of WHO guidance and tools
4. Systematic review of cost projections of new vaccine introduction
5. Take-home messages

What is vaccine delivery cost



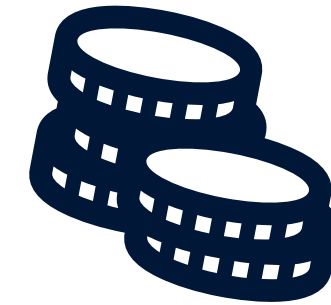
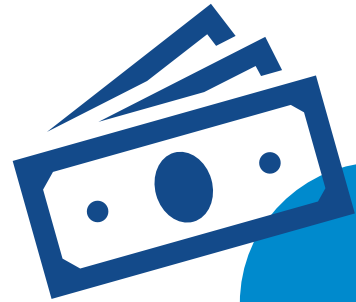
Costs associated with delivering immunization programmes to target populations (exclusive of vaccine costs)



How to calculate the costs using ingredients approach



Unit cost (or price) x utilization number (quantity)



EPI childhood vaccines
VS
Vaccines for expanded target groups

Different
delivery strategies !!!

Cost components

Vaccine procurement

- Vaccines
- Diluent
- Syringes
- Safety boxes
- Waste management
- International shipment
- Insurance
- Customs/duties

Service delivery

- Personnel
 - Allowance
 - Supplies and materials
- (for different delivery modalities)

Programme support activities

- Microplanning
- Training
- Supervision
- Social mobilization/ Information, education and communication (IEC)

Capital investment

- Equipment for cold storage expansion

Vaccine delivery costs

Examples of use of vaccine delivery cost estimates

1

Cost calculation

2

Budgeting plan

3

Programme planning

4

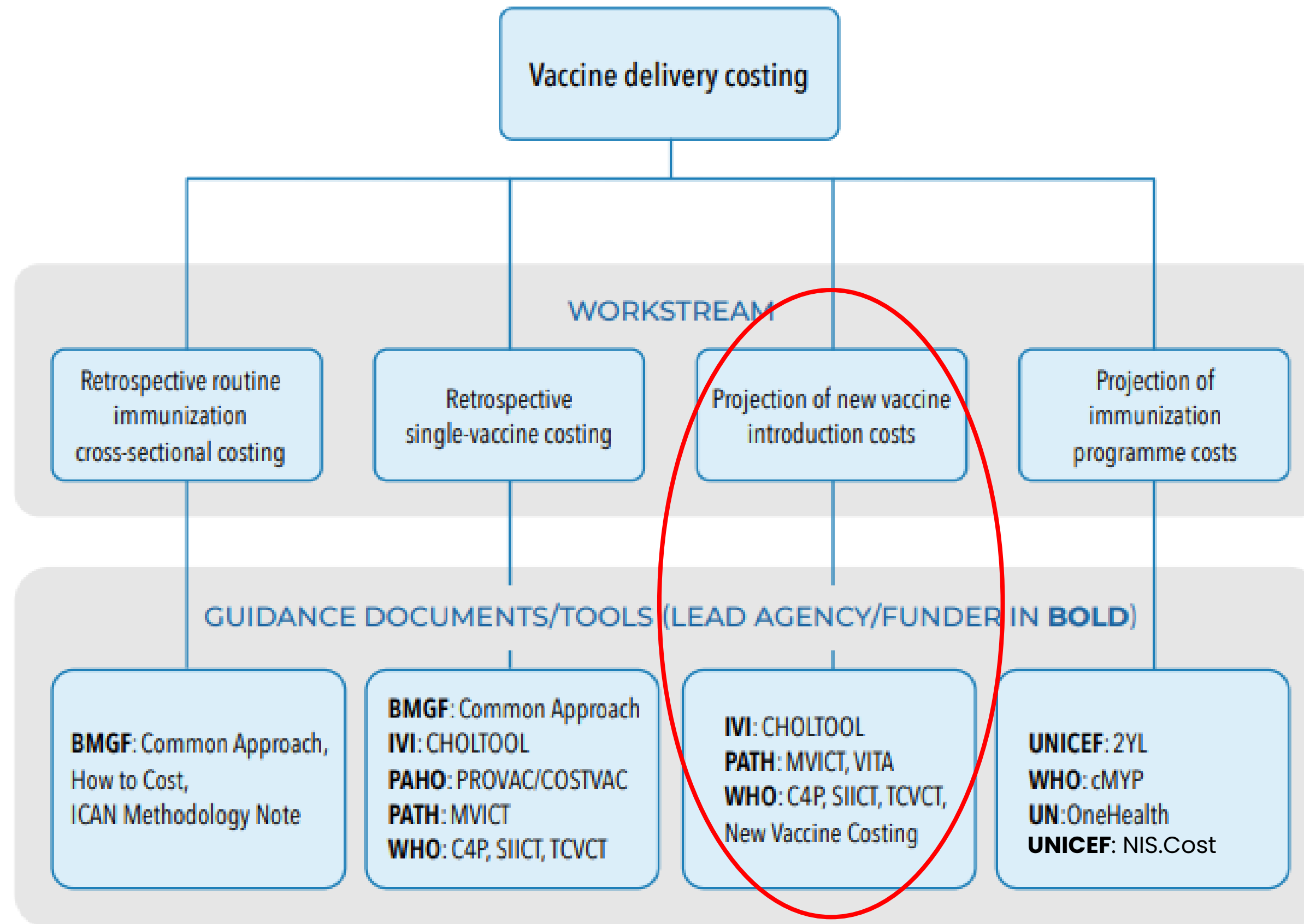
Economic evaluations

(e.g., cost-effectiveness analysis [CEA], cost-benefit analysis [CBA])

5

Investment case

Major types of vaccine delivery costing



World Health Organization. (2022). Standard terminology and principles for vaccine delivery costs. <https://www.who.int/publications/i/item/9789240052475>
 Levin A, et al. WHO-led consensus statement on vaccine delivery costing: process, methods, and findings. BMC Med 20, 88 (2022).

Costing for new vaccines: examples of WHO guidance and tools

Tools

1. [COVID-19 Vaccine Introduction and deployment Costing tool \(CVIC tool\)](#)
2. [Cervical Cancer Prevention and Control Costing Tool: human papillomavirus vaccination module \(C4P-HPV tool\)](#)
3. [Seasonal Influenza Immunization Costing Tool \(SIICT\)](#)
4. [Typhoid Conjugate Vaccine Costing Tool \(TCVCT\)](#)

Guidance

1. [Guidelines for estimating costs of introducing new vaccines into the national immunization system](#)
2. [Standard terminology and principles for vaccine delivery costs](#)

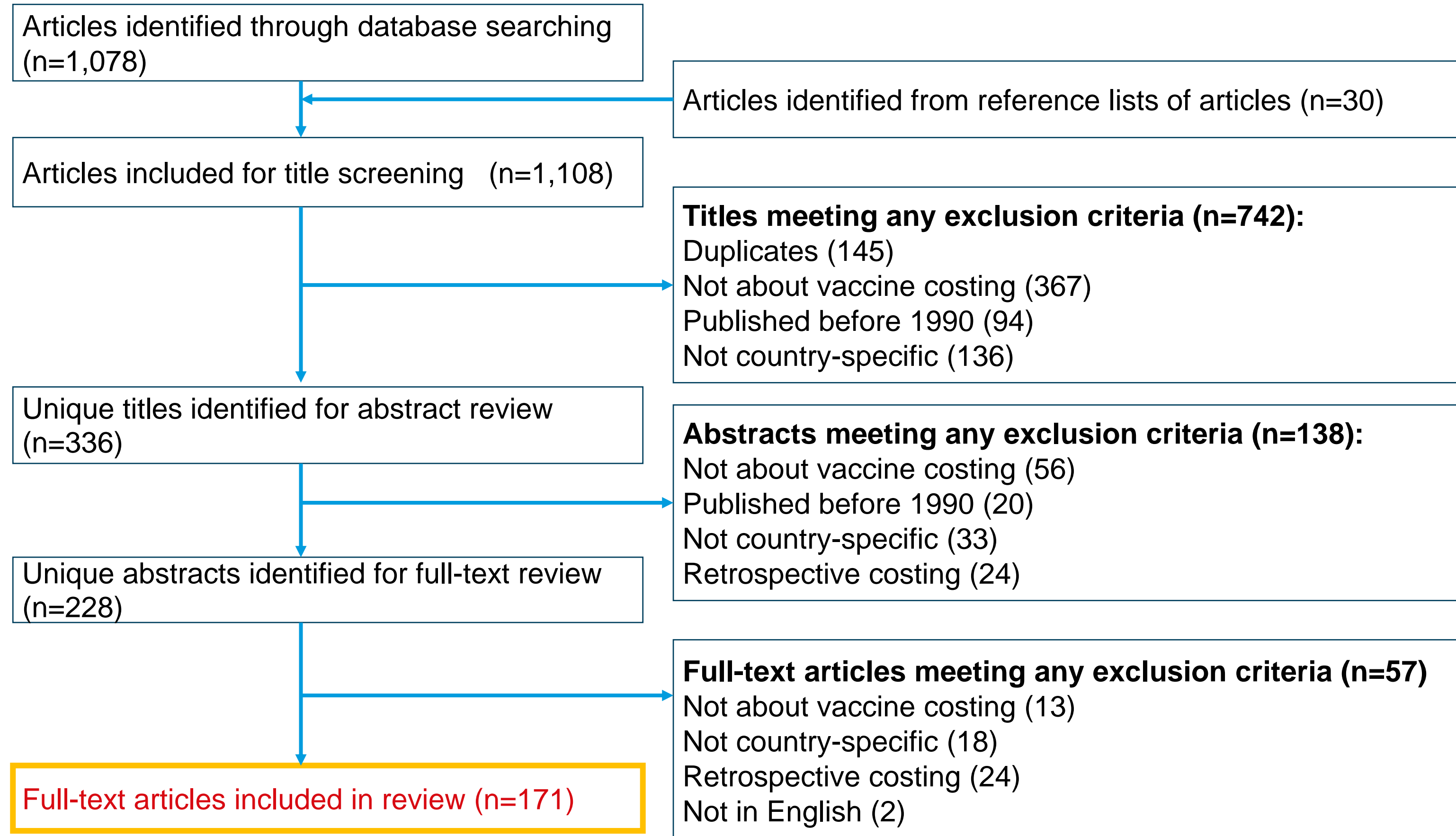
Guidelines for estimating costs of introducing new vaccines into the national immunization system



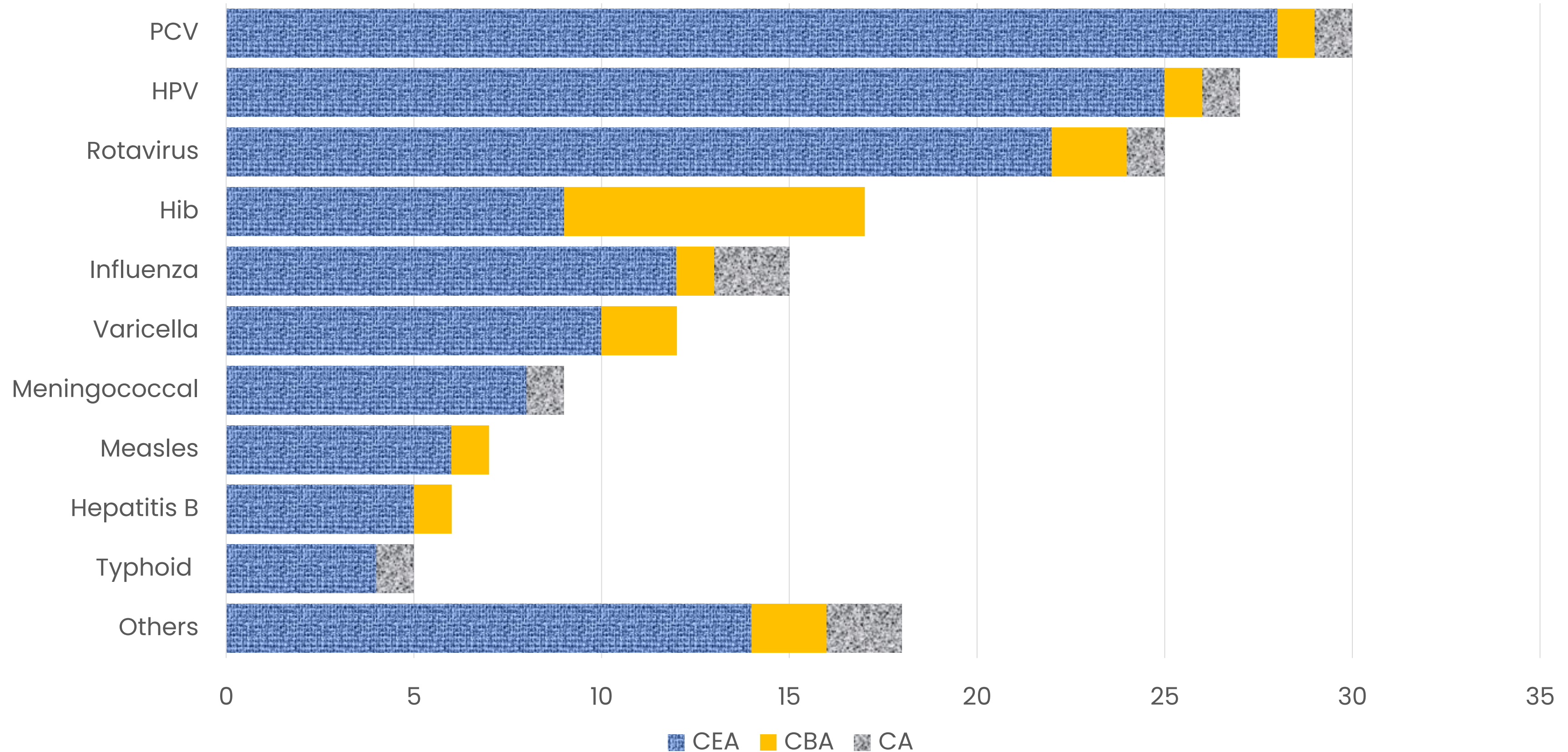
DEPARTMENT OF VACCINES
AND BIOLOGICALS



Systematic review of cost projections of new vaccine introduction



Studies by type of economic evaluation and vaccine (n=171)



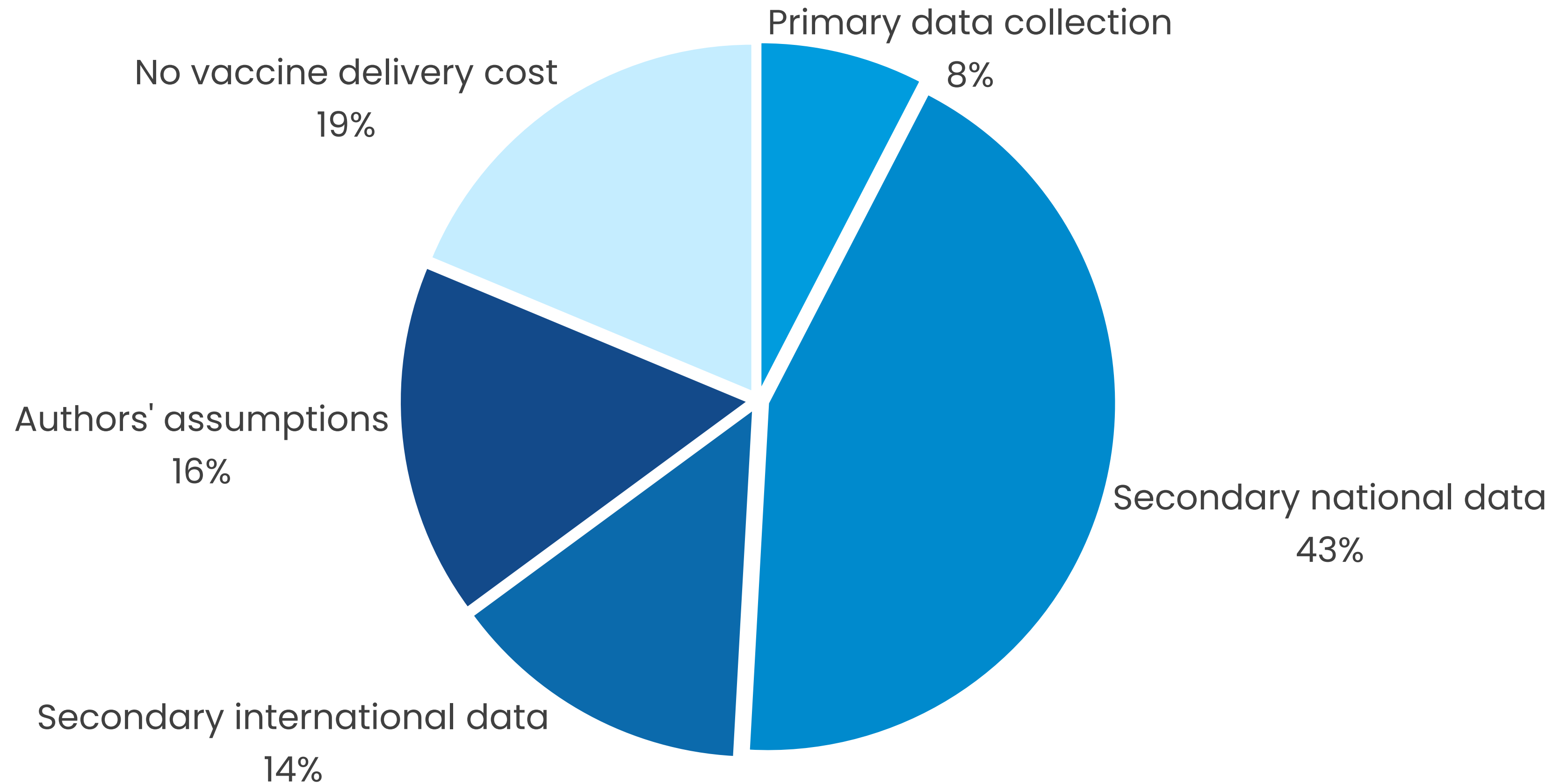
Objectives of studies with new vaccine cost projections (n=171)

Table 1

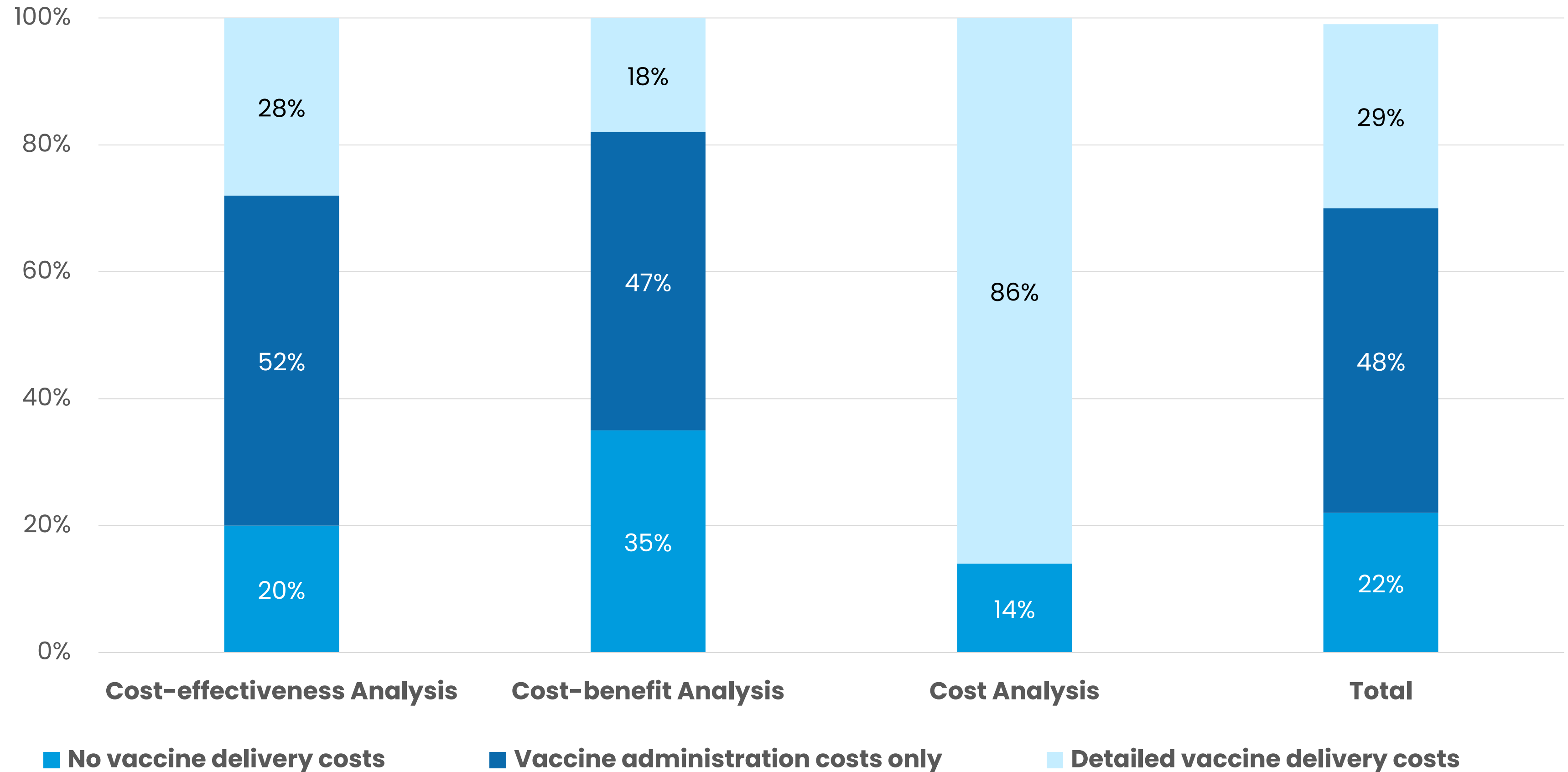
Objectives of studies with new vaccine cost projections by vaccine.

Vaccine	Evaluate the cost-effectiveness (# of articles)	Compare costs and benefits (# of articles)	Estimate total cost (# of articles)	Assess impact and economic outcomes (# of articles)	Estimate the impact of changing presentation of vaccine (# of articles)	Other (# of articles)
Pneumococcal	17			12	1	
Human papillomavirus (HPV)	17	1		7	1	1 paper's main objective is to introduce a costing tool
Rotavirus	10	2	1	11	1	
Haemophilus influenzae type b (Hib)	8	6		2	1	
Influenza	10	1	2	1	1	
Varicella	8	2		2		
Meningococcal	6			1	2	
Measles	4	1		1	1	
Typhoid	3		1	1		
Polio	1	1		2		
Oral cholera	3	1				
Hepatitis B	4	1		1		
COVID-19	1		1	2		
Measles-rubella				1	1	
Rubella	2					
Yellow fever	1					
Pentavalent			1			
Total	95 (56%)	16 (9%)	6 (4%)	44 (26%)	9 (5%)	1 (1%)

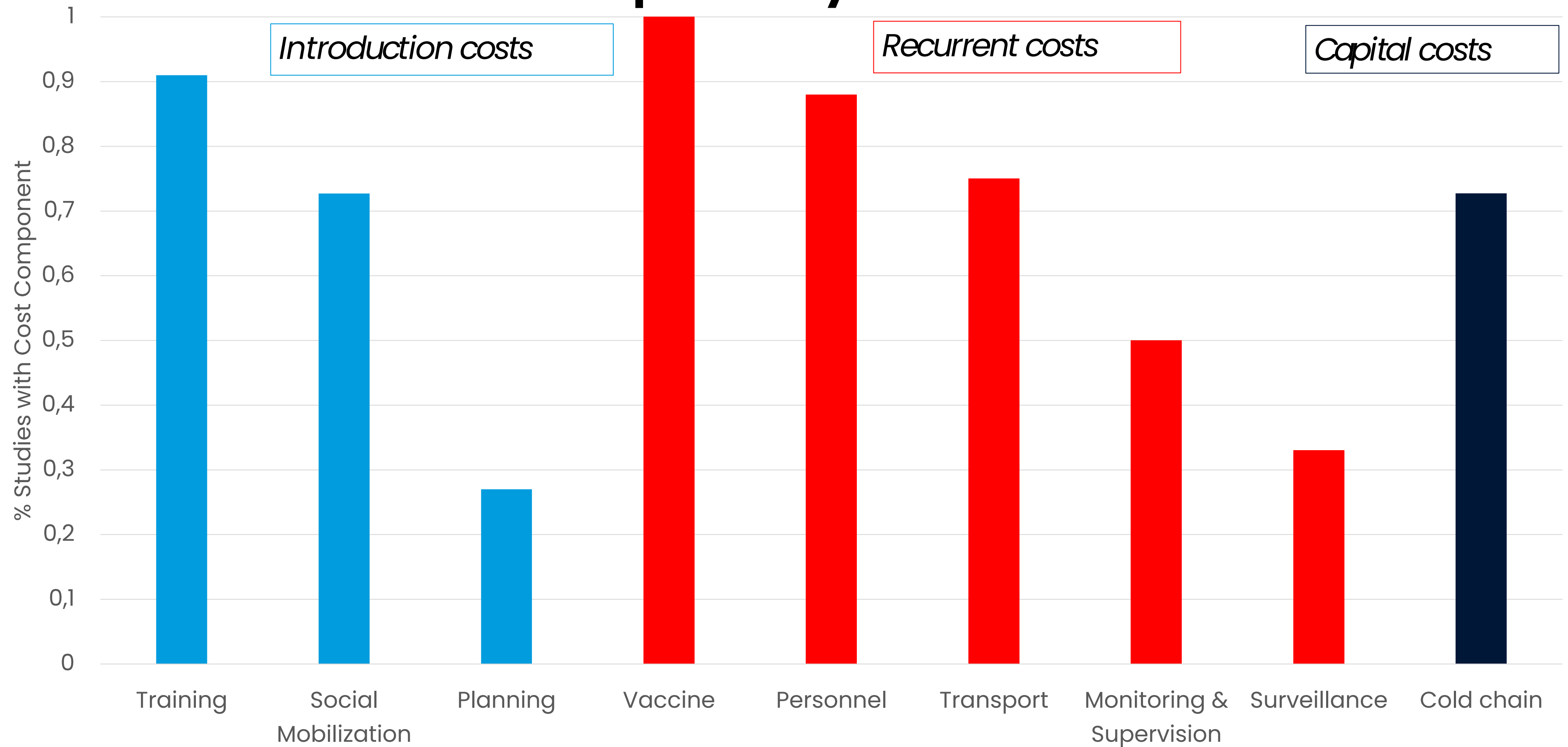
Source of vaccine delivery costs (n=171)



Studies by type of economic evaluation and completeness of vaccine delivery cost data (n=171)



Common cost components of vaccine delivery costs included in studies with primary data collection



Methods of analyses

Vaccine procurement costs

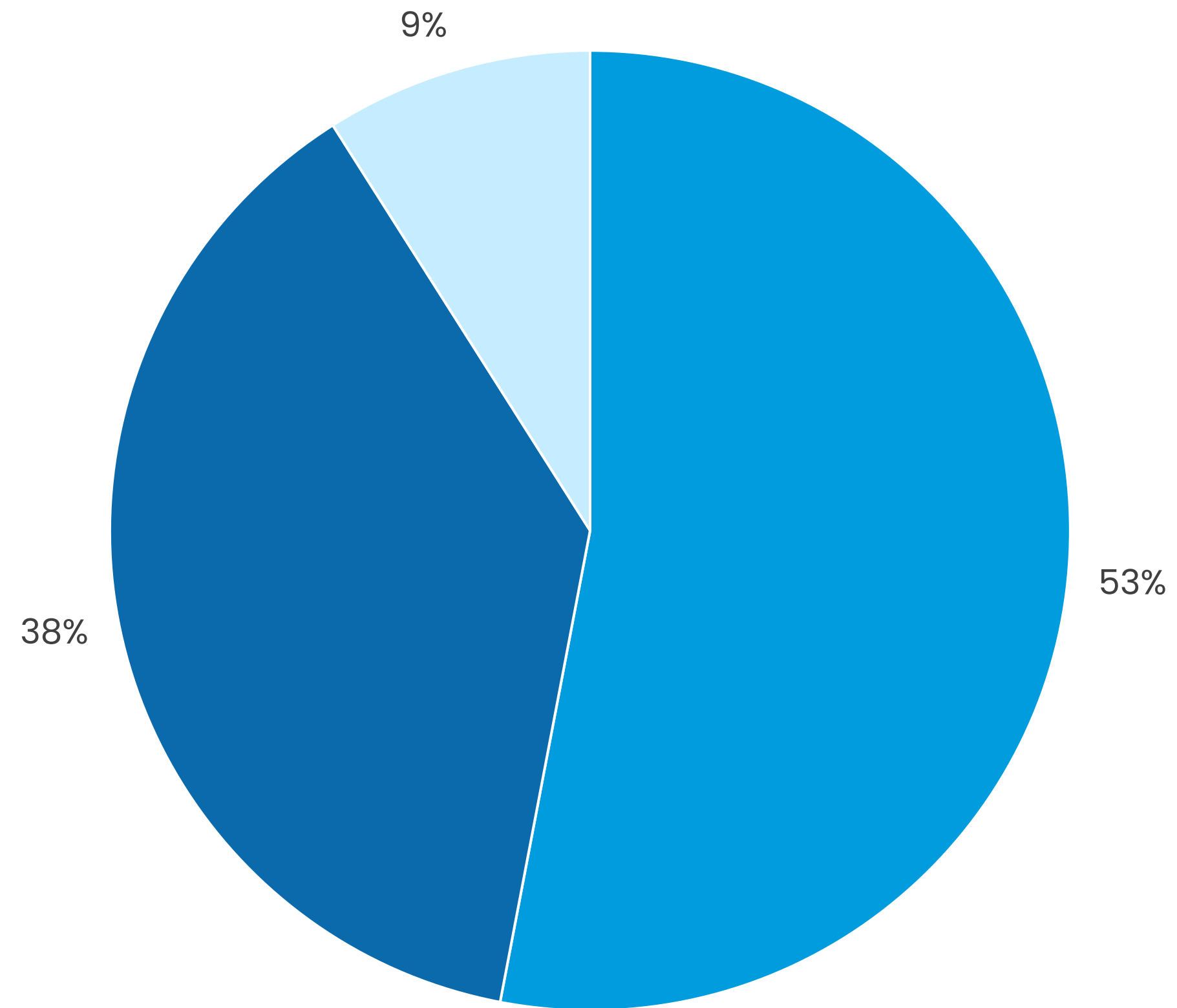
- 98% studies projected cost of purchasing vaccines through estimation of size of target population multiplied by coverage and price per dose
- A few studies conducted parity pricing (compare 2 vaccine products)
- Sensitivity analyses to vary costs of vaccine
- Only 12% studies specified that included freight, insurance and handling charges in their calculations

Methods of analyses

Vaccine delivery costs

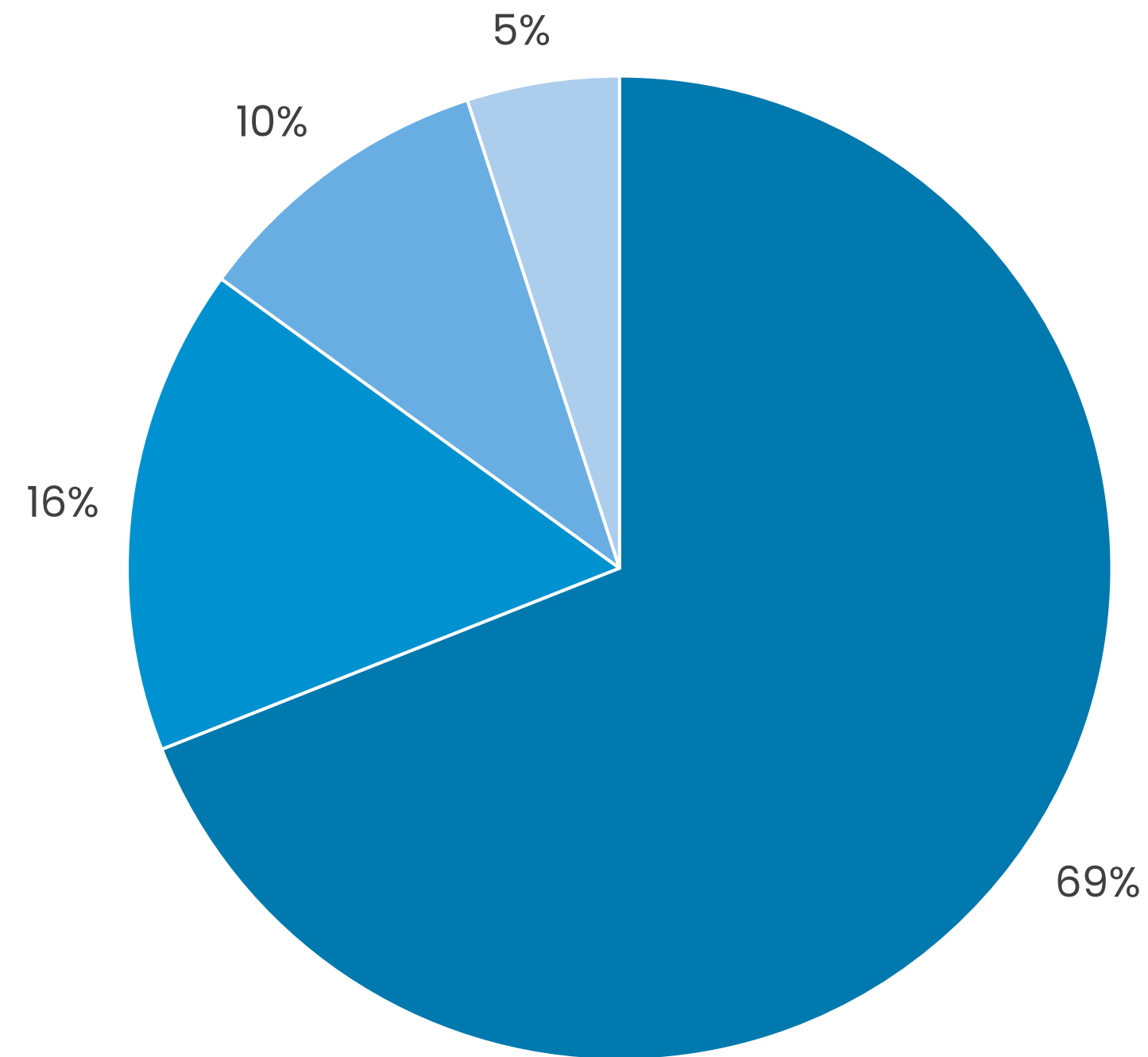
- 64% studies used aggregate costing
- 15% studies conducted micro-costing
- One study used top-down costing

Characterization of data uncertainty on cost



■ One-way sensitivity analysis ■ Probabilistic sensitivity analysis ■ No analysis of uncertainty

Use cases of new vaccine cost projection studies



- Generate evidence on CEA/CBA to inform policy decision-making on new vaccine introduction
- Compare CEA of alternative vaccines
- Compare CEA of alternative service delivery strategies
- Estimate vaccine introduction cost for planning and advocacy

Take-home messages

1. Ingredients approach is recommended
2. Cost projection of new vaccine introduction generates evidence on CEA/CBA to inform policy decision-making on new vaccine introduction
3. Important to include vaccine delivery costs in a cost analysis
 - Not underestimate the costs of introducing the vaccines
 - Should be separated from vaccine procurement costs
3. Costs should be mapped and reported as either inputs or activities
4. Uncertainty around cost estimates should be appropriately characterized
5. Updated guidance document on calculation of vaccine delivery costs could assist new vaccine costing studies to be more comparable



**World Health
Organization**



Thank you