

Using health economics to inform decision making

Human papillomavirus as an example

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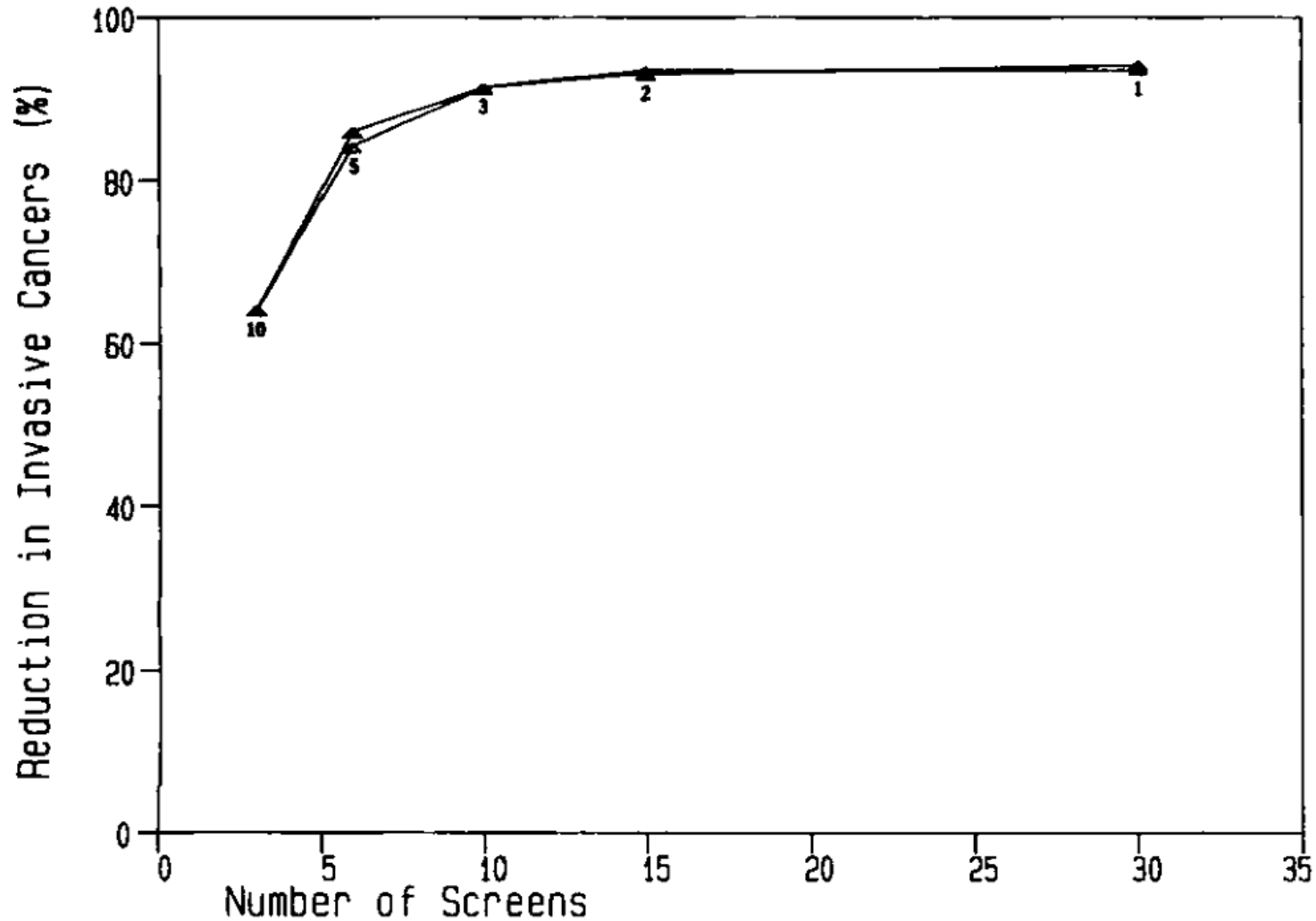
Health Protection Agency

London, United Kingdom



The role of health economics

Health economics guides decision making about allocating scarce health care resources (money, staff time, beds etc.) to maximise benefits.



Example: cervical cancer control

You have just been appointed the Minister of Health of your country and would like to devise a programme to reduce the incidence of cervical cancer.

Which of these options would you choose:

- Schoolgirl HPV vaccination?
- Schoolgirl + schoolboy HPV vaccination?
- Screen using HPV testing as triage followed by cytology?
- Screen using visual inspection with acetic acid (VIA) or with Lugol's iodine (VILI)?
- Some combination of the above?

Uses of health economics in health care policy

Decision making

- Choosing between options

Price negotiation

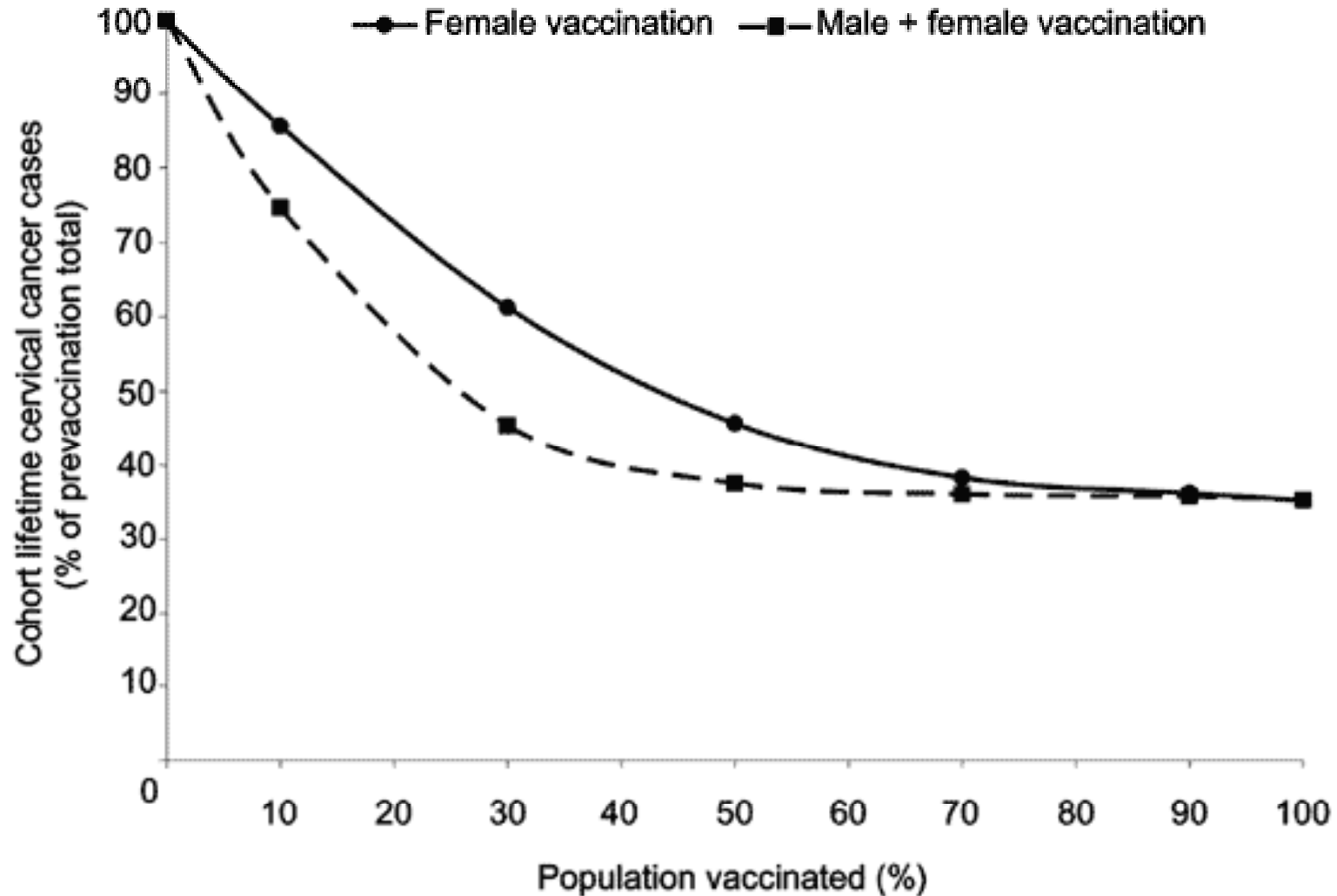
- Setting target prices for an intervention to be a good use of resources

Advocacy

- Clarifying the cost and health implication of choices to funders

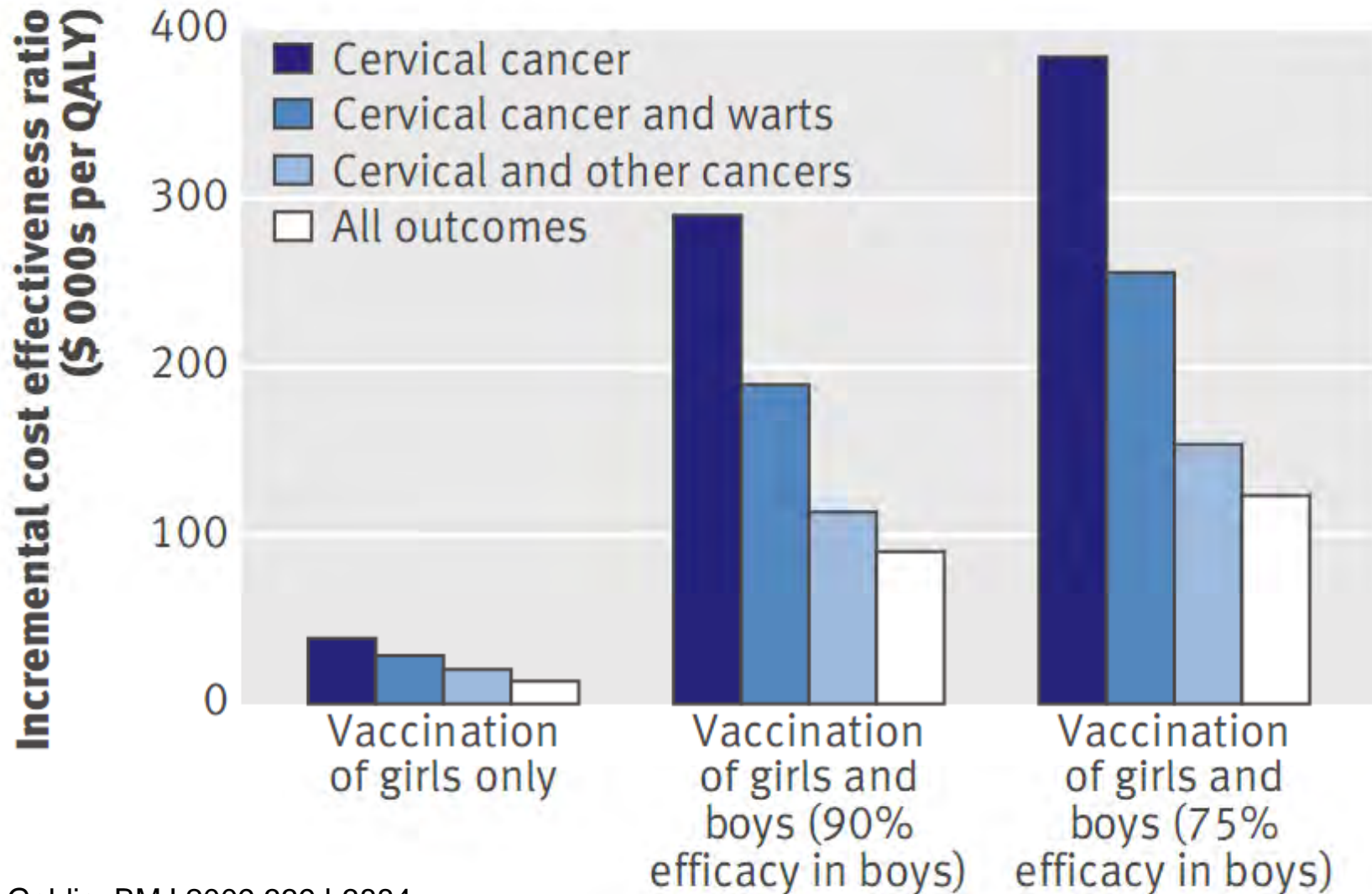
Decision making: choosing between options

Should we vaccinate boys or more girls?



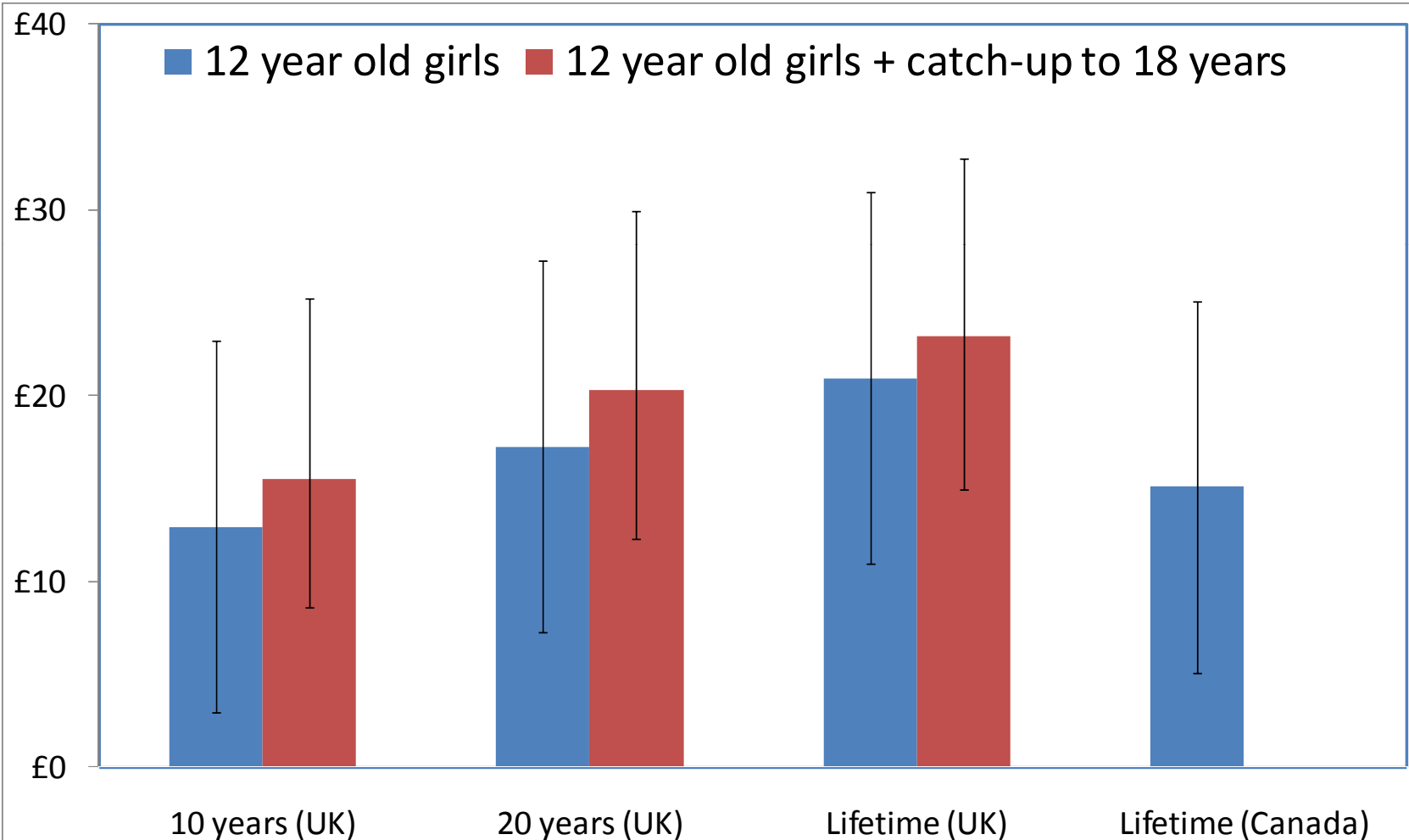
Decision making: choosing between options

Should we vaccinate boys or more girls?



Price negotiation: setting target prices

Price differential per dose between equally cost-effective bivalent and quadrivalent vaccines

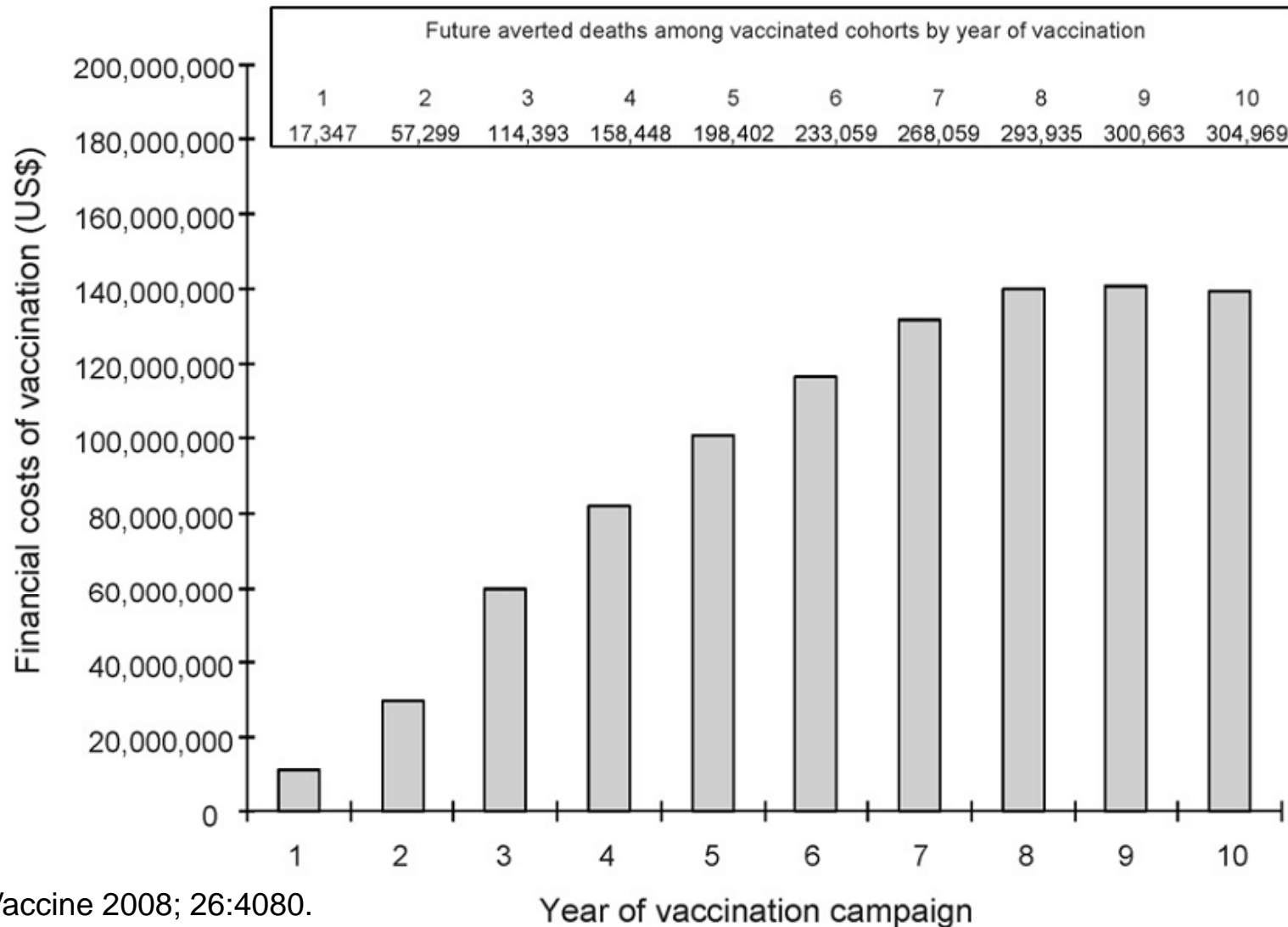


Jit *et al.* BMJ 2008; 337:a769

Brisson *et al.* Vaccine 2007; 25:5399 Duration of vaccine protection

Advocacy: clarifying costs and benefits to funders

Financial costs and cancer deaths averted by HPV vaccination in 72 GAVI-eligible countries.



Examples of guidance or policy made using evidence from health economic modelling

USA (2007):

Advisory Committee on Immunization Practice recommends HPV vaccination for females aged 9-26.

Based on analyses in Kim et al. NEJM 2008; 359:821.

UK (2008):

Department of Health chooses Cervarix® for national HPV immunisation programme after competitive tendering.

Based on analyses in Jit et al. BMJ 2008; 337:a769.

WHO (2008):

WHO concludes that male HPV vaccination will have limited impact on cervical cancer incidence in females.

Based on analyses by Kim et al. Br J Cancer 2007; 97:1322 + others.

Types of outcomes from an economic model

Epidemiological outcomes

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graph TD; A[Epidemiological outcomes] --> B[Costs and cost savings]; A --> C[Clinical outcomes]; A --> D[Health outcomes]; B --- B_list["• Health service<br>• Other public sector<br>• Society"]; C --- C_list["• Diagnosed cancers<br>• Positive test results<br>• Hysterec-tomies"]; D --- D_list["• Life years saved<br>• DALYs<br>• QALYs"];
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Costs and cost savings

- Health service
- Other public sector
- Society

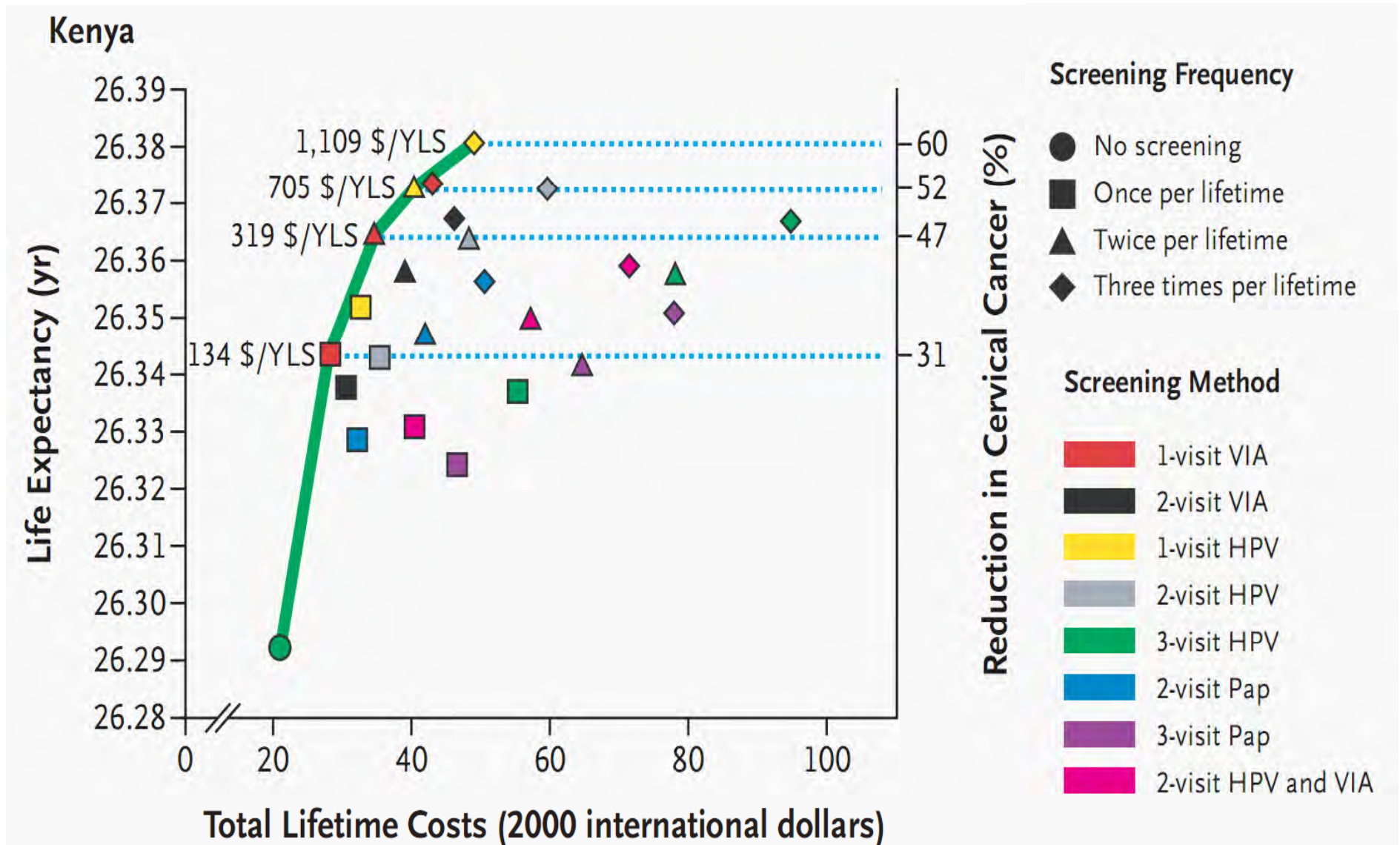
Clinical outcomes

- Diagnosed cancers
- Positive test results
- Hysterec-tomies

Health outcomes

- Life years saved
- DALYs
- QALYs

Types of outcomes from an economic model



Goldie et al. NEJM 2005; 353:2158.

How can health economics help you?

- Economic models for HPV are highly complex and take months or years to develop...
- However, a model developed for a particular country can be reparameterised for another.
- Data requirements to parameterize an HPV model for a specific country
 - Epidemiology: age-specific prevalence of infection and cancer
 - Health service utilization
 - Behavioral: sexual mixing patterns
- IHMG (International Human Papillomavirus Modelling Group) brings together modellers, some of whom are keen to work with local partners in developing countries