



Economic impact of achieving HPV vaccination and cervical screening targets in London

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Agenda

A very short intro to Health Economics

Health Economic modelling project: "Economic impact of achieving HPV vaccination and cervical screening targets in London"

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(A very) short intro to Health Economics



What is economics?

Unlimited

wants

Resources constrained

Introduction to economic evalua



'Economic problem'



Introduction to economic evaluation



What is health economics?



Health economics is concerned with how best to allocate scarce resources to improve the population's health



care

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Introduction to economic evaluation

What should be produced/delivered?

The 'economic problem' and opportunity cost in health and social

How should it be produced/delivered?

Who should receive health care?



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What is the role of a health economist





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Economic evaluation

"Is this intervention a good use of resources?"

Economic evaluation - a process of comparing the costs and consequences of different healthcare interventions or programs to inform decision-making in funding



Source: Klarenbach, S., Tonelli, M., Chui, B. et al. Economic evaluation of dialysis therapies. Nat Rev Nephrol 10, 644–652 (2014). https://doi.org/10.1038/nrneph.2014.145



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Economic evaluation toolbox

pproaches	Measure			· · · · · · · · · · · · · · · ·
Cost-utility nalysis	Incremental cost-effectiveness ratio, cost per quality-adjusted life year	Budget impact		C effect
ost- fectiveness nalysis	Incremental cost-effectiveness ratio e.g. cost per admission avoided	analysis		an
Cost-benefit malysis	Assign monetary value to costs and benefits, present net monetary benefit			
Cost- consequence analysis	Present costs and benefits separately in a disaggregated format	Cos consequ	it- lence	Cost-benefit analvsis
3udget impact analysis	Summarises the net budget impact	analy	'SIS	

Cost-utility analysis



Modelling the economic impact of achieving HPV vaccination and cervical screening targets in London



Why is this important

Symptoms of Cervical Cancer



Vaginal bleeding that is unusual for you



Changes to vaginal discharge



Pain or discomfort during sex



Pain in your lower back or pelvis

For your protection, even if you have had the HPV vaccination you will still be invited for cervical screening Don't ignore your invite!





<u>Cervical Cancer UK</u> Office of Health Economics, 2024



NHS London Cervical Cancer elimination strategy

Prevent cases of cervical cancer through **enhanced vaccination** Improve access in schools

 Improve access out of schools e.g. catchup clinics

 Targeted interventions to address inequalities

Awareness campaigns

90% of boys and girls fully vaccinated with the HPV vaccine by the age of 15 by 2030

Support earlier treatment through cancer screening Information, awareness, community engagement

Improve access

- Targeted interventions to address inequalities
- Strengthen capacity through workforce

70% of women aged between 25-64 years screened with a highperformance test by 2030 Eliminate cervical cancer by 2040



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To help make the case for additional funding..

We were commissioned to develop an economic model to estimate the value of investing in strategies aimed at increasing coverage rates, from a health care and wider societal perspective.



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Our approach
 We combined cost-benefit and cost- utility analysis
 CBA demonstrated the broader economic impact on the population of London affected by cervical cancer
 CUA provided evidence of the value of preventing health loss (QALY loss avoided)





Overview of modelling approach

Decision problem: What is the potential return on investment in eliminating cervical cancer by increasing HPV vaccination and screening coverage?

		ltem	Details
Approach	Model type	Perspective	Health care payer and wider societal perspective
Cost-benefit and cost-utility	Multi-year decision tree	Population	Women aged 25 to 64 at risk of cervical cancer
anaiysis	moder	Time horizon	Costs and outcomes over the duration of the model - 2025 to 2050
	Data, evidence &	Discounting	3.5% for costs and benefits (as per NICE methods guidance)
Modelling tool Adaptable	assumptions Drawn from many	Primary outcome	Net Present Value Incremental Cost Effectiveness Ratio
modelling tool	validated by stakeholders	Secondary outcomes(s)	Life Years gained; Productivity gains; Cost savings

*Clinical, epidemiological and economic evidence was collated from various sources e.g. literature, national statistics. NHS cost collections



Model structure (simplified)









Cost and benefits included in the model

Costs

- Investment package
 - Interventions and strategies to achieve targets
- Resource use
 - Vaccination, screening, diagnosis, treatment
- Productivity loss
 - Mortality, morbidity and informal care

Benefits

- Clinical outcomes
 - Cervical cancer, CIN incidence
- Resource use avoided
 - Diagnosis, treatment
- Health gain
 - QALY loss avoided
- Productivity loss avoided
 - Mortality, morbidity and informal care









Scenario 1

Cervical cancer incidence (rate per 100,000 population): all ages

2040 2043 2046

2049

2025 2028 2031 2034 2037

4.0

3.0

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Cervical cancer cases by stage in 2025 and 2050: age 25 to 64

150

1618

5

250

300

350

400

200

No. of cervical cancer cases

164

100

50







... and it offers greater health benefit at a lower cost*





Change in ICER over time

 By 2030 the investment becomes cost-effective as the cost per QALY loss avoided falls below NICE willingness-to-pay thresholds.





Main limitations

Simplified version of a complex pathway

True effect of the vaccine is underestimated, e.g. does not account for herd immunity or transmission dynamics in the population

It focuses solely on cervical cancer and not on other HPV-related cancers, therefore, does not account for full benefit of HPV vac

Population level. Therefore, does not account for differences across subgroups.

(1) Jit et al (2008). Economic evaluation of human papillomavirus vaccination in the United Kingdom. BMJ. 2008 Jul 17;337:a769. doi: 10.1136



Any questions?

