

# MODELLING THE COST-EFFECTIVENESS AND CAPACITY IMPACT OF CHANGES TO COLPOSCOPY REFERRAL GUIDELINES FOR WOMEN WITH MILD DYSKARYOSIS IN THE ENGLISH CERVICAL SCREENING PROGRAMME

## Theme: Making cost-effectiveness analysis specific to and dependent on local service design

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### Objective:

To develop a model which will allow local clinicians in England to input population and policy data for their own colposcopy service and evaluate the effects of new guidelines in terms of **capacity** and **cost-effectiveness**



### Background:

Recent guidelines suggest **referral to colposcopy after one mild dyskaryosis cervical screening result** rather than two (1).

• We previously developed a computer model of colposcopy service management and capacity to examine increases in referrals (2).

• A separately developed model examined long-term cost-effectiveness but only on a national basis (3).

This study links the two models to test how local policy for managing colposcopy affects cost-effectiveness.

### Methods:

The models allow clinicians to choose from local policy options.

If increase in referrals is significant, clinicians test different colposcopy management policies to reduce capacity and/or improve cost-effectiveness.

Model / user manual were piloted to be user-friendly.

Model allows for 1000's of scenarios. We examine:

'Typical' (most frequently adopted in current practice),

'High intensity' (most capacity required)

'Low intensity' (least capacity required).

Policy type	Choices available		L = Low intensity, T = Typical, H = High intensity
	Cytology type	Screening interval	
Screening policies	Cytology type	Conventional cytology Liquid based cytology	
	Screening interval	3 yearly 5 yearly	
	Mild referral policy	Age-related screening policy Refer after 2 mild results	
Colposcopy policies	Borderline referral policy	Refer after 1 mild result Refer after 2 borderline results Refer after 3 borderline results	
	Post-negative colposcopy policy	Discharge Repeat colposcopy in 6 months Repeat colposcopy in 12 months	L / T H
	HPV management policy	Discharge Repeat colposcopy in 6 months Repeat colposcopy in 12 months	L / T H
	CIN 1 management policy	Discharge Repeat colposcopy in 6 months Treat immediately	L H / T
	CIN 1 time-to-treat policy	NA - as discharge chosen above Treat at 6 months Treat at 12 months Treat at 18 months Treat at 24 months	L H / T
	Treatment policy (low-grade referrals)	NA - as discharge chosen above See and treat Treat later	L H / T
	Treatment policy (high grade)	See and treat	L / T

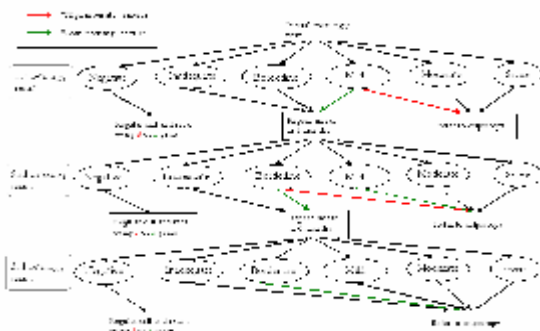
### Colposcopy Management Policy Results for a Local service (pop'n = 300,000)

The model suggests that, given current screening policy guidelines, the optimal colposcopy service in terms of capacity requirements and cost-effectiveness is to:

- discharge women receiving negative and HPV colposcopy results,
- use 'see and treat' appointments rather than 'treat later', and
- to offer one repeat colposcopy to women who receive a CIN 1 result.

	Capacity (clinics required)	Costs	LYs	QALYs	Difference in costs	Difference in LYs	Difference in QALYs	Net Benefit (threshold = £20,000)	Net Benefit (threshold = £30,000)
High intensity service	1138	£15,186,532	1887209	1886412	0	0	0	£37,713	£56,577
Discharge post-negative colposcopy	1063	£14,953,981	1887209	1886412	-£240,553	0	0	£37,713	£56,577
See & treat high grade (not 2 visits)	1012	£14,686,884	1887209	1886412	-£249,696	0	0	£37,714	£56,578
Discharge HPV ('typical' service)	995	£13,504,677	1887209	1886412	-£1,182,207	0	0	£37,715	£56,579
See & treat low grade (not 2 visits)	950	£13,426,586	1887209	1886412	-£1,780,901	0	0	£37,715	£56,579
Treat CIN1 earlier (at 18 months)	917	£13,226,388	1887214	1886418	-£200,197	5	6	£37,715	£56,579
Treat CIN1 earlier (at 12 months)	872	£13,008,059	1887219	1886423	-£218,500	10	11	£37,715	£56,580
Treat CIN1 earlier (at 6 months)	822	£12,761,786	1887222	1886426	-£246,273	13	14	£37,716	£56,580
Discharge CIN1 ('low intensity' service)	671	£12,730,247	1887169	1886362	-£31,539	-40	-49	£37,715	£56,578

### Screening Policies

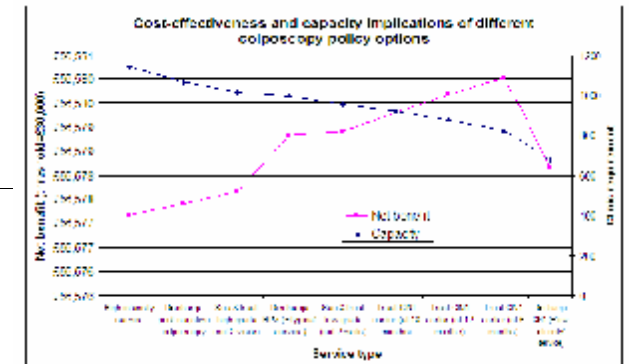
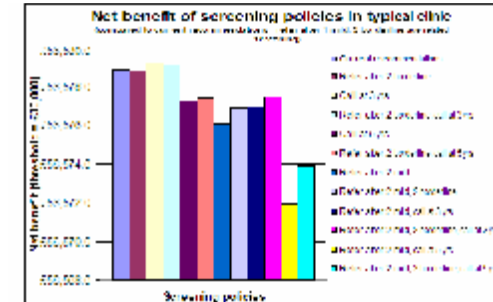


### Screening Policy Results for a Local service (total population = 300,000)

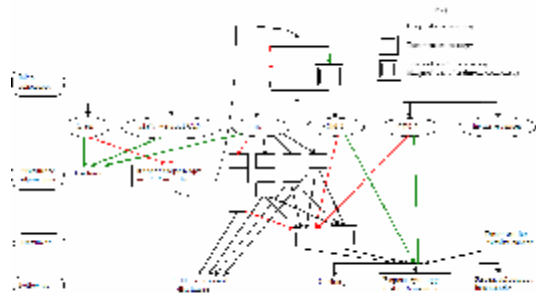
Single mild dyskaryosis referral is cost-effective for all types of service. On average, colposcopy workload increases 21.7% in for services not currently operating this policy.

Policy	Clinics per 6 months Capacity	Discounted Lifetime Costs	Discounted Lifetime QALYs	Dif in costs	Dif in QALYs	Cost per QALY gained
'Typical' service - refer after 2 mild	608	£13,348,775	1,886,313			
'Typical' service - refer after 1 mild	995	£13,504,677	1,886,412	£155,902	99	£1,576
'High intensity' service - refer after 2 mild	754	£14,873,671	1,886,313			
'High intensity' service - refer after 1 mild	1138	£15,186,532	1,886,412	£312,861	99	£3,162
'Low intensity service' - refer after 2 mild	484	£12,683,344	1,886,250			
'Low intensity service' - refer after 1 mild	671	£12,730,247	1,886,362	£46,903	113	£416

Re-screening every 5 years (rather than 3 or 5 depending on age) is not cost-effective. Referral after 2 borderline (rather than 3) is not cost-effective (differences very small).



### Colposcopy Management Policies



### Conclusions:

This local-level model for practitioners helps establish 'best practice' for their service. Integrating local health systems modelling with cost-effectiveness analysis is possible

A user-friendly model is now available on the SCHARR website via the NHS Cancer Screening Programme website to aid local service planning. See:

<http://www.shef.ac.uk/scharr/sections/heds/modelling/cervical-screening>

### References

- (1) Colposcopy and Programme Management. Guidelines for the NHS Cervical Screening Programme. NHSCSP Publication No. 20, 2004. [www.cancerscreening.nhs.uk](http://www.cancerscreening.nhs.uk)
- (2) Eggington S, Hadwin R, Brennan A, Walker P. Modelling the impact of referral guideline changes for mild dyskaryosis on colposcopy services in England. Guidelines for the NHS Cervical Screening Programme. NHSCSP Publication No. 24, 2006.
- (3) Karnon J, Peters J, Platt J, Chilcott J, McGoogan E, Brewer N. Liquid-based cytology in cervical screening: an updated rapid and systematic review and economic analysis. Health Technology Assessment 2004; 8(20).