

Estimates of effectiveness and reach for 'return on investment' modelling of smoking cessation interventions using data from England

Clean Air Coalition of BC Presentation

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Summary

- What is ROI modelling?
- The EQUIPT model
- Estimating intervention effects and reach for EQUIPT
- Issues to consider

ROI modelling

- **Cost effectiveness (CE)**
 - Incremental cost-effectiveness ratio (ICER) is cost per life-year gained, QALY or DALY
- **Cost benefit (CB)**
 - Ratio of cost to return per unit of delivery with economic benefit, including monetised health outcome and financial savings
- **Return on Investment (ROI)**
 - Economic benefit in a designated population for total intervention cost for the population

Relative to a
comparator

Parameters required for ROI modelling

- Impact of the intervention on behaviour
 - Total number of ex-smokers created
- Impact of the behaviour on health outcomes
 - Number of designated health outcomes averted
- Costs associated with health outcomes
 - Total treatment costs, productivity costs, deaths

Over a specified
timescale

Estimating numbers of ex-smokers created

$$E = N \times S$$

E=Number of ex-smokers

N=Number of smokers who try to stop

S=Proportion of smokers who succeed

Over a specified
timescale

Interventions increasing quit attempts

Intervention type	Specification
Tax increase	5% real increase in cost of smoking
Indoor smoking ban	Complete ban, fully complied with
Mass media campaign	400 GRP, 4-10 weeks per year
Brief physician advice	5 mins, all smokers, offer of support
Provision of NRT for reduction	Any NRT product to help smokers cut down

Interventions increasing quit success (pharmacotherapy)

Intervention type	Specification
Single form NRT (8 weeks)	Patch, gum, lozenge, nasal spray etc.
Dual form NRT (8 weeks)	Patch plus another product
Varenicline (12 weeks)	As per SPC
Varenicline (24 weeks)	As per SPC
Bupropion (6-8 weeks)	As per SPC
Nortriptyline (12-14 weeks)	75-100mg pd
Cytisine (4 weeks)	As per SPC

Interventions increasing quit success (behavioural)

Intervention type	Specification
Face-to-face (individual)	4 h over 6 weeks to NCSCT standard
Face-face (group)	6.5 h over 6 weeks to NCSCT standard
Telephone	Pro-active 4h over 6 weeks to NCSCT standard
Text messaging	Automated, daily then less often for 4 weeks
Printed materials	Books or booklets

Interventions not included

Advertising bans

Health warnings

Standardised packaging

NRT pre-loading

E-cigarettes

Websites and apps

Methods

- Reach estimation

- Population interventions: 100%
- Clinical interventions: Data from Smoking Toolkit Study (www.smokinginengland.info) for England

- Effectiveness estimation

- Quit attempts: risk ratio and base-rate over one year; Cochrane, up-to-date reviews, and articles
- Quit success: risk ratio 12-months after quit date; Cochrane, up-to-date reviews, and articles

Reach and effect on quit attempts

Intervention	Reach	Effect size (RR)
Increases in taxation	100%	1.20
Ban on smoking in public indoor areas	100%	1.10
Mass media campaigns	100%	1.03
Brief opportunistic advice by a physician	21%	1.40
Nicotine replacement therapy (NRT) for 'reduce to quit'	12%	2.10

Reach and effect on quit success (pharmacotherapy)

Intervention	Reach	Effect size (RR)
Single form nicotine replacement therapy (NRT)	5%	1.60
Dual form nicotine replacement therapy (NRT)	2%	2.14
Varenicline (12 weeks)	5%	2.24
Varenicline (24 weeks)	1%	2.76
Bupropion	1%	1.60
Nortriptyline	0%	2.00
Cytisine	0%	3.98

Reach and effect on quit success

Intervention	Reach	Effect size (RR)
Behavioural support (individual)	2%	1.40
Behavioural support (group)	1%	1.88
Telephone support (proactive)	0.5%	1.37
Text messaging	0.5%	1.63
Printed materials	1%	1.19

Caveats and assumptions

- Interventions are assumed to combine multiplicatively except for combinations of types of pharmacotherapy and types of behavioural support
- Effect sizes are assumed to be independent of population, setting, and other interventions
- Interventions are assumed to be delivered to specification
- Some estimates are synthetic estimates based on combining RRs from different studies

Future research

- Need to start creating models of intervention combinations, predicting synergistic and antagonistic interactions
- Need evidence of intervention impacts in different populations and settings
- Need more evidence on under-researchers interventions (e.g. cytisine, e-cigarettes, websites and apps)
- Need more evidence on impact on inequality

Discussion



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