Brief interventions delivered in GP surgeries to improve quit rates

Matrix Insight, in collaboration with Imperial College London, Kings College London and Bazian Ltd, were commissioned by Health England to undertake a research study to develop and apply a method for prioritising investments in preventative interventions for England. Seventeen preventative health interventions were included in the study. Each intervention was evaluated in terms of the following criteria: reach; inequality score; cost-effectiveness; and affordability. This report presents the results of the analysis for one of the interventions: brief interventions delivered in GP surgeries to improve quit rates. The full report of the study is available from the ***H.E.L.P.*** website.

Summary

Description of the intervention
Five minutes of GP opportunistic advice to smokers presenting at GP surgeries, compared to no advice or usual care (Parrot, Godfrey and Kind, 2006).

Criteria	Measure	Value	Certainty
1. Reach			
Percentage of population affected by the condition and that could potentially benefit from the intervention.	Adult smokers visiting a GP as a percentage of the population aged 15 and above in England (Healthcare Commission 2007; Office for National Statistics, 2009)	19.18%	★★★
2. Inequality score			
Ratio of the percentage of disadvantaged population to the percentage of the general population that could potentially benefit from the intervention.	Ratio of percentage of adult smokers in routine and manual occupations to percentage of smokers in the general population (Office for National Statistics, 2009)	1.55	★★
3. Cost-effectiveness			
Cost of the intervention per QALY gained (in £2007/08)	See cost-effectiveness	£1,151	★★
Net cost of the intervention per QALY gained (in £2007/08)	See cost-effectiveness	-£2,169	★★
Timing of benefits	QALY gain and cost savings are estimated to occur in the long-run (5 years or more after the intervention).		
4. Affordability			
Total cost of implementing the intervention at the national level	Multiple of eligible individuals and unit cost of the intervention	Less than £100 million	★★★

Key to certainty grading scales

★ Low quality evidence

★★ Medium quality evidence

★★★ High quality evidence

Box 1. Cost per QALY gained

A quality adjusted life year (QALY) is a simple way of combining quality of life with length of life.
One QALY is equivalent to one year in full health. The cost per QALY gained is therefore the cost of achieving one extra year of full health. Its calculation is based on the following formula:

$$cost\ per\ QALY\ gained = \frac{incremental\ cost\ of\ intervention}{QALYs\ gained}$$

The net cost per QALY gained is the cost per QALY considering the incremental cost of the intervention as well as the cost saved through health treatment avoided. Its calculation is based on the following formula:

$$net\ cost\ per\ QALY\ gained = \frac{incremental\ cost\ of\ intervention - cost\ savings}{QALYs\ gained}$$

Cost effectiveness

Cost. Brief interventions delivered in GP surgeries to improve quit rates on average cost £11 per person more than usual care (£2007/08).

Effect. Compared to usual care, brief interventions delivered in GP surgeries increase the quit rate by 0.727 per cent. This effect was obtained from a review undertaken to identify evidence on the effectiveness and cost-effectiveness of smoking cessation interventions.

Benefits. The benefits of the intervention derive from stopping individuals smoking. Two types of benefits are considered: QALYs and health care cost savings.[1] Based on the QALYs gained and the health care cost savings of quitting smoking, a 0.727 per cent increase in the quit rate is associated with the following benefits:

- An additional 0.009 QALYs per person
- Cost savings of £31.1 per person (£2007/08)

Please refer to decision model for details on how the QALY gain and cost savings were calculated.

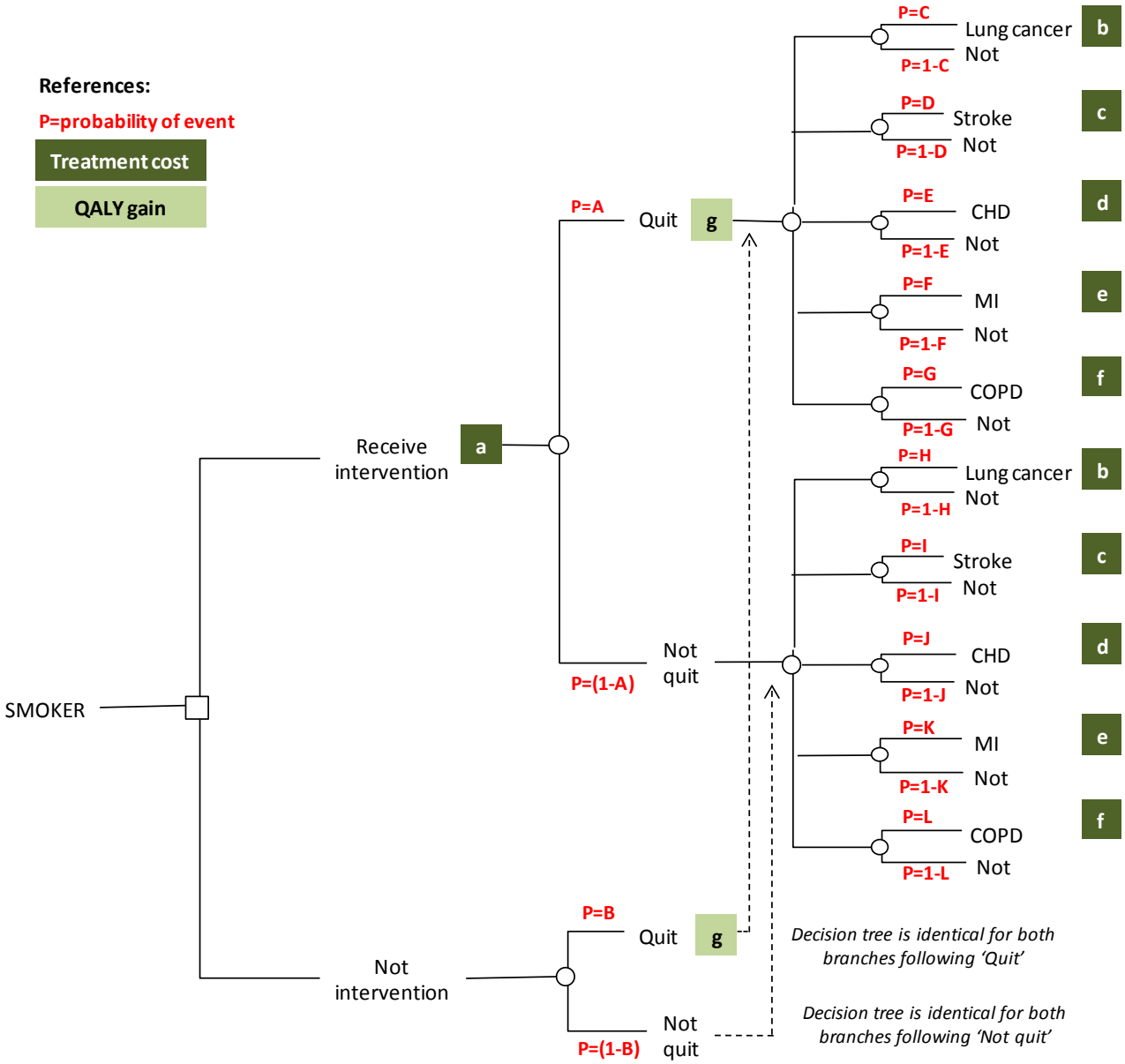
[1] Cost associated with increased life expectancy resulting from the intervention –such as pensions and health care costs– are not included in the analysis.

Decision model

An economic model was built to estimate the cost-effectiveness of the intervention. The model estimates the QALY gain and cost savings associated with the intervention. Figure 1 illustrates the structure of the model, which is based on the following assumptions:

- The effect of the intervention is given by a change in the chances of an individual's quitting smoking.
- Individuals receiving the intervention are assumed to be 45 years old on average.
- Smoking is assumed to be associated with five diseases: lung cancer, stroke, coronary heart diseases (CHD), myocardial infarction (MI) and chronic obstructive pulmonary disease (COPD). These diseases have impacts in terms of quality of life and health care costs.
- The probabilities of experiencing these diseases vary for smokers and former smokers. Former smokers have reduced probabilities of experiencing the diseases. Thus, quitting smoking reduces the probability of experiencing these diseases and produces corresponding improvements in quality of life and health care cost savings.

Figure 1. Smoking cessation model



Unless stated otherwise, the analysis was undertaken in accordance with H.M. Treasury's Green Book (HM Treasury, 2003). Specifically:

- Any costs and effects incurred more than one year after the intervention were discounted at 3.5%.
- Where necessary monetary values were converted in 2007/8 prices using Gross Domestic Product (GDP) deflators (HM Treasury, 2008).
- Where necessary monetary values were converted into pounds sterling using: www.x-rates.com

The model draws the following estimates from the literature:

- The unit cost of the intervention (Table 1).
- The effect of the intervention on people's smoking behaviour (Table 1).
- The probabilities that those who smoke experience diseases (Table 2).
- The probabilities that those who don't smoke experience diseases (Table 2).
- The impact of experiencing diseases on quality of life, measured in QALYs (Table 3).
- The impact of experiencing diseases on health care treatment costs (Table 3).

Table 1. Intervention costs and effects (monetary values in £2007/08)

Ref	Description	Value	Calculation and source
a	Cost of intervention	£10.8	Based on cost of 5 minutes GP time including overheads (Parrot, Godfrey and Kind, 2006).
A	P(if intervention, 12-month quit)	0.0073	This is the incremental quit rate -i.e. over and above the background or natural quit rate assumed at 1% (Parrot, Godfrey and Kind, 2006). See evidence review.
B	P(if no intervention, 12-month quit)	0.0000	Given that the effect of the intervention measures incremental quit rate, the probability of quitting for those not receiving the intervention is assumed zero.

Table 2. Transition probabilities

Ref	Description	Value	Calculation and source
The probability of contracting the disease for (former) smokers was assumed to be equivalent to the average prevalence of the disease among (former) smokers. These were calculated for three different age groups: 55 to 64, 65 to 74, and 75 and older. The following formula was used in the calculation: $$D = \frac{x}{t} \cdot D_x \cdot RR_x + \frac{y}{t} \cdot D_x \cdot RR_y + \frac{z}{t} \cdot D_x \cdot RR_z$$ where: D = prevalence of disease; RR = relative risk of contracting the disease; x = non-smokers; y = former smokers; z = smokers.; and t = total population.			

Ref	Description	Value	Calculation and source
C	P(if smoker, lung cancer) by age group	0.0045 0.0297 0.0329	These were obtained by applying the following parameters to the above formula: ▪ Prevalence of the disease in the total population by age group (D=0.0015; D=0.008; D=0.008). ▪ Relative risk of lung cancer among men (RR smokers=1; RR former smokers=0.44; RR non-smokers=0.03) and women (RR smokers=1; RR former smokers=0.21; RR non-smokers=0.05). ▪ Proportion of smokers in the general population by age group (z/t=0.195; z/t= 0.116; z/t=0.08). ▪ Proportion of former smokers in the general population by age group (y/t=0.367; y/t=0.419; y/t=0.469). All data refers to the UK (Flack et al, 2007).
H	P(if former smoker, lung) cancer) by age group	0.0014 0.0087 0.0095	
D	P(if smoker, stroke) by age group	0.0272 0.0961 0.1684	These were obtained by applying the following parameters to the above formula: ▪ Prevalence of the disease in the total population aged 65 to 74 years old (D=0.022; D=0.076; D=0.133). ▪ Relative risk of stroke (RR smokers=1.37; RR former smokers=1.11; RR non-smokers=1). ▪ Proportion of smokers in the general population by age group (z/t=0.195; z/t= 0.116; z/t=0.08). ▪ Proportion of former smokers in the general population by age group (y/t=0.367; y/t=0.419; y/t=0.469). All data refers to the UK (Flack et al, 2007).
I	P(if former smoker, stroke) by age group	0.0220 0.0778 0.1365	
E	P(if smoker, CHD) by age group	0.2149 0.4564 0.5771	These were obtained by applying the following parameters to the above formula: ▪ Prevalence of the disease in the total population aged 65 to 74 years old (D=0.111; D=0.215; D=0.264). ▪ Relative risk of CHD (RR smokers=3.12; RR former smokers=1.55; RR non-smokers=1). ▪ Proportion of smokers in the general population by age group (z/t=0.195; z/t= 0.116; z/t=0.08). ▪ Proportion of former smokers in the general population by age group (y/t=0.367; y/t=0.419; y/t=0.469). All data refers to the UK (Flack et al, 2007).
J	P(if former smoker, CHD) by age group	0.1068 0.2267 0.2867	
F	P(if smoker, myocardial infarction) by age group	0.0854 0.1644 0.1694	These were obtained by applying the following parameters to the above formula: ▪ Prevalence of the disease in the total population aged 65 to 74 years old (D=0.067; D=0.121; D=0.121). ▪ Relative risk of MI among men (RR smokers=1.6; RR former smokers=1.11; RR non-smokers=1) and women (RR

Ref	Description	Value	Calculation and source
K	P(if former smoker, myocardial infarction) by age group	0.0592 0.1141 0.1175	smokers=2.76; RR former smokers=1.05; RR non-smokers=1). ▪ Proportion of smokers in the general population by age group (z/t=0.195; z/t= 0.116; z/t=0.08). ▪ Proportion of former smokers in the general population by age group (y/t=0.367; y/t=0.419; y/t=0.469). All data refers to the UK (Flack et al, 2007).
G	P(if smoker, COPD) by age group	0.0114 0.0578 0.1152	These were obtained by applying the following parameters to the above formula: ▪ Prevalence of the disease in the total population aged 65 to 74 years old (D=0.01; D=0.05; D=0.10). ▪ Relative risk of COPD among men (RR smokers=1; RR former smokers=0.84; RR non-smokers=0.68) and women (RR smokers=1; RR former smokers=0.96; RR non-smokers=0.92). ▪ Proportion of smokers in the general population by age group (z/t=0.195; z/t= 0.116; z/t=0.08). ▪ Proportion of former smokers in the general population by age group (y/t=0.367; y/t=0.419; y/t=0.469). All data refers to the UK (Flack et al, 2007).
L	P(if former smoker, COPD) by age group	0.0103 0.0519 0.1034	

Table 3. Associated outcomes (monetary values in £2007/08)

Ref	Outcome	Value	Calculation and source
All lifetime treatment cost calculations were based on the present value of the annual treatment cost through the expected duration of the disease. The duration of the disease was assumed to be given by the difference between the average onset and mortality ages for the disease. Three possible onset ages were considered: 60, 70 and 80 years old. Total treatment costs were discounted to the age of individuals receiving the intervention, which was assumed 45 years old, at a 3.5% annual rate.			
b	Lung cancer treatment cost by onset age of disease	£4,923 £3,490 £2,474	The annual treatment of lung cancer cost was estimated by Flack et al (2007) at £5,742 (in £2007/08). The mortality age was assumed to be equal to that for colon cancer and to increase with the onset age of the disease. As reported by Matrix (2006), the mortality ages assumed are: 64, 74 and 86 years old.
c	Stroke treatment cost by onset age of disease	£4,905 £2,101 £2,187	The annual treatment cost was estimated by Matrix (2006) at £2,194 (in £2007/08) based on data from the Department of Health. The average mortality was assumed to increase with the onset age of the disease. As reported by Matrix (2006), the mortality ages assumed are: 64, 72 and 84 years old.
d	CHD treatment cost by onset age of disease	£7,182 £4,547 £2,809	The annual treatment cost was estimated by Matrix (2006) at £1,511 (in £2007/08) based on data from the British Heart Foundation. The average mortality was assumed to increase with the onset age of the disease. As reported by Matrix (2006), the mortality ages assumed are: 72, 78 and 87 years old.

Ref	Outcome	Value	Calculation and source
e	Myocardial infarction treatment cost by onset age of disease	£10,790 £6,831 £4,221	The annual treatment cost was estimated by Flack et al (2007) at £2,270 (in £2007/08) based on data from the Department of Health and the Health and Social Care Information Centre. The mortality age was assumed to be equal to that for CHD and to increase with the onset age of the disease. As reported by Matrix (2006), the mortality ages assumed are: 72, 78 and 87 years old.
f	COPD treatment cost by onset age of disease	£4,594 £2,908 £1,797	The annual treatment cost was estimated by Flack et al (2007) at £967 (in £2007/08) based on data from the National Clinical Guideline on Management of COPD. The mortality age was assumed to be equal to that for CHD and to increase with the onset age of the disease. As reported by Matrix (2006), the mortality ages assumed are: 72, 78 and 87 years old.
g	QALYs: 12 month quit	1.29	This is the number of QALYs gained associated with lifetime quitting based on the number of quitters at 12 months. It was estimated by Fiscella and Franks (1996) using the results from the Healthy People 2000 Years of Healthy Life research project (US). It implicitly assumes a 35% relapse rate.

Effectiveness evidence

A literature review was undertaken by Bazian to identify evidence on the effectiveness and cost-effectiveness of brief interventions delivered in GP surgeries to improve quit rates. Further details are available on the evidence methods page of the ***H.E.L.P.*** website.

The review of the evidence on the effectiveness of brief interventions delivered in GP surgeries identified one review of studies and two randomised control studies. Table 4 provides the following details of the studies identified:

- Population
- Intervention
- Results

The review of the evidence on the cost-effectiveness of brief interventions delivered in GP surgeries identified four studies. Table 5 provides the following details of the studies identified:

- Population, intervention and model
- Perspective, discounting, inflation, cost year
- Utility/benefit
- Unit costs
- Efficiency

Table 6, Table 7 and Table 8 provide a quality assessment of the studies. Further details are available on the quality appraisal methods page.

The following criteria were applied to select effectiveness evidence for undertaking the economic analysis:

- Location. Studies from the UK were preferred over studies from other locations.
- Population. Studies applied to the general population were preferred over studies applied to restricted population groups (e.g. pregnant women; individuals from specific communities/nationalities).
- Counterfactual. Studies for which the counterfactual intervention was ‘usual care’ or ‘do nothing’ in a UK setting were preferred over studies for which the counterfactual was different from ‘usual care’ or ‘do nothing’.
- Method. Studies using more rigorous design methods (e.g. randomised control trials or quasi experimental designs with regression models controlling for confounders) were preferred over studies using less rigorous design methods (e.g. before-after studies or simple correlation analysis).

Table 4. Effectiveness of brief interventions delivered in GP surgeries to improve quit rates

Study reference	Population	Intervention	Results
Effectiveness extraction is based on a Cochrane review identified by the review for NICE guidance PH1: “Brief interventions and referral for smoking cessation” that pooled 17 studies of minimal GP intervention vs. control: Lancaster & Stead, 2004. NICE reviewers use this as a basis for their own analyses and re-categorise some of the studies that Lancaster and Stead defined as 'extensive' as brief (according to this rapid review of evidence) and included them in a meta-analysis along with the original studies. However, the meta-analytic value from Lancaster and Stead is used in NICE's cost effectiveness modelling and is therefore extracted here.			
Lancaster and Stead, 2004 ▪ systematic review	Smokers of either gender in any setting (most recruited participants in primary care who were not selected on the basis of motivation to quit).	*Intervention* ▪ Brief physician advice (minimal intervention) to stop smoking delivered in the context of routine care. Advice was defined as verbal instructions from physician with a 'stop smoking' message, irrespective of whether or not information was provided about harmful effects of smoking. This review did not include studies in which patients also received NRT, or where advice was delivered as part of a multi-factorial lifestyle counselling (inc. diet and exercise advice). This is brief opportunistic GP advice *Control* ▪ No advice or usual care	Odds of quitting (OR): 1.74 (95% CI 1.48 to 2.05)

Study reference	Population	Intervention	Results
Butler et al, 1999; UK ▪ randomised controlled trial with parallel cost study (see below)	536 smokers who consulted GPs in South Wales; people with terminal illness were excluded.	*Intervention* ▪ Motivational counselling involved 3 phases: initially patients asked to numerically rate their motivation and confidence to quit. Phase 2 involved clinicians' response to the scores using specific questions and strategies. In phase 3 patients were encouraged to identify arguments for change and steps to do so and to set meaningful targets *Control* ▪ Brief advice involved clinician saying: "Smoking is an extremely serious matter. Apart from lung cancer, smoking can damage your health in many other ways. If you give up now, a lot of the harm can be undone. It is my professional duty to tell you that you must give up smoking in the interests of your future health"	Results were not significant Odds ratio for having quit for at least a week with motivational counselling vs. brief intervention: 1.9 (95% CI 0.95 to 3.38)

Study reference	Population	Intervention	Results
Lennox et al, 2001; UK ▪ randomised controlled trial with parallel cost study (see below)	2,553 smokers aged 17 to 65 years in six general practices in Aberdeen, Scotland.	*Intervention* ▪ All participants received a questionnaire asking about their smoking habit ▪ Intervention participants received either a computer tailored or a non-tailored letter on smoking cessation ▪ Tailored letter generated by a computerised system that compiled a letter based on answers that participant gave in questionnaires. Experts devised the decision rules based on participant details ▪ Non-tailored letter generated by the computerised system but scanning a blank questionnaire *Control* ▪ No letter about smoking cessation; letter thanking them for their participation	Validated cessation rate at 6 months: 66% (-4% to 186%) greater in non-tailored letter vs. no letter (p=0.07)

Table 5. Cost-effectiveness of brief interventions delivered in GP surgeries to improve quit rates

Study reference	Population, intervention and model	Perspective, discounting, inflation, cost year	Utility/benefit	Unit costs	Efficiency
NICE's cost-effectiveness review26 found 7 studies deemed relevant to NICE guidance, 3 of which looked solely at brief GP interventions (not including NRT etc): these are extracted here (see pages 13, 14, and 15 and appendix 2). Additional economic simulations27 for this guidance are also extracted here. Brief GP interventions (not including additional telephone, NRT, nurse etc. support)					
Butler, 1999; UK ▪ randomised controlled trial with parallel cost study	Pragmatic RCT of motivational counselling (9.96mins) vs. brief advice (2mins) in 21 general practices in South Wales, UK. 536 smokers who consulted GPs in South Wales; people with terminal illness were excluded.	▪ Health perspective ▪ No discounting ▪ No adjustment for inflation ▪ Cost year: unclear (study published in 1999)	NS	Training: ▪ £69.50 per clinician (which worked out to be £9.52 per smoker receiving motivational counselling) Cost of motivational counselling: ▪ £23.11 per patient over the cost of brief advice (which includes the extra consultation of £13.59 per patient)	Marginal cost: ▪ £450.65 per additional quitter for motivational counselling; £265 per additional quitter when training costs are excluded ▪ £312 per quit attempt (including training) for motivational counselling

Study reference	Population, intervention and model	Perspective, discounting, inflation, cost year	Utility/benefit	Unit costs	Efficiency
Cummings, 1989; USA ▪ primary studies for effectiveness were not sourced or appraised as this study undertook a pooling/meta-analysis of three of them. QA of effectiveness data-point is therefore based on this pooling]	Cost study of physician advice to stop smoking during a routine visit; intervention involved 4 minutes of physician time and self-help materials; opportunistic intervention so patient costs are excluded (as patient would attend regardless of receiving the intervention) vs. no intervention. Effectiveness evidence was from a systematic review and pooling of results from 3 RCTs.	▪ Societal perspective ▪ 5% discounting ▪ Unclear whether inflation adjusted ▪ Cost year: USD1984	Gains in life expectancy estimated from published literature of increase in life expectancy for men and women between the ages of 35 and 69 years at the time of quitting (based on data from American Cancer Society's 25-state Cancer Prevention Study).		Cost effectiveness ranged from $705 to $988 per year of life saved for men and from $1204 to $2058 for women.
Lennox, 1999; Scotland ▪ randomised controlled trial with parallel cost study	Cost-effectiveness based on an RCT of computer tailored or a non-tailored, standard letter on smoking cessation, or no letter in 2,553 smokers aged 17 to 65 years in 6 general practices in Aberdeen, Scotland.	▪ Health perspective ▪ 5% discounting ▪ Unclear whether adjusted for inflation ▪ Cost year: unclear (study published 2001)	NS	Estimated total cost of £464 but not stated how this is derived.	Increase in cost per additional quitter in non-tailored letter group compared to no letter group: £37 (best case scenario) to £89 (worst case scenario) Cost per LYG: £50 (best case scenario) to £122 (worst case scenario)

Study reference	Population, intervention and model	Perspective, discounting, inflation, cost year	Utility/benefit	Unit costs	Efficiency
Parrot, Godfrey and Kind, 2006 ▪ University of York; additional modelling for NICE) ▪ effectiveness estimate used in modelling is from Lancaster and Stead (2004) – see above	▪ GP brief opportunistic advice (5 minutes) ▪ No intervention (1% background quit rate is assumed) ▪ Model for a cohort of smokers for which mean age and gender can be varied. Model based upon ages of 30, 40, 50 and 60 years ▪ Decision tree: Researchers state that they couldn't do a Markov model and used 4 cohorts (aged 30, 40, 50, 60) - they give LYG for each cohort and we assume this is modelled over the remaining life for each. LYGs given in column BY are LYG from quitting and are based on estimates by Doll et al (2004)	▪ Health perspective ▪ 3.5% discounting ▪ No adjustment for inflation ▪ Cost year: 2004/2005 (per minute staff costs based on 2004/2005 costs)	▪ 30 years old: 10 LYG ▪ 40 years old: 9 LYG ▪ 50 years old: 6 LYG ▪ 60 years old: 3 LYG Life years saved were calculated from gains in life expectancy from American Cancer Society's State Cancer Prevention Study.	▪ £10 per smoker (5 minutes GP time including overheads)	

Study reference	Population, intervention and model	Perspective, discounting, inflation, cost year	Utility/benefit	Unit costs	Efficiency
Cummings, 1989; USA ▪ primary studies for effectiveness were not sourced or appraised as this study undertook a pooling/meta-analysis of three of them. QA of effectiveness data-point is therefore based on this pooling]	Cost study of physician advice to stop smoking during a routine visit; intervention involved 4 minutes of physician time and self-help materials; opportunistic intervention so patient costs are excluded (as patient would attend regardless of receiving the intervention) vs. no intervention. Effectiveness evidence was from a systematic review and pooling of results from 3 RCTs.	▪ Societal perspective ▪ 5% discounting ▪ Unclear whether inflation adjusted ▪ Cost year: USD1984	Gains in life expectancy estimated from published literature of increase in life expectancy for men and women between the ages of 35 and 69 years at the time of quitting (based on data from American Cancer Society's 25-state Cancer Prevention Study).		Cost effectiveness ranged from $705 to $988 per year of life saved for men and from $1204 to $2058 for women.

Table 6. Quality assessment for meta-analysis

Study reference	QA for meta-analysis			Score	Grading (++ 3; + 2; -1)
	Search and inclusion criteria?	Quant data each study?	Assessment of quality data?		
Lancaster and Stead, 2004	Yes	Yes	Yes	3	++
Cummings, 1989	No	Yes	Yes	2	+

Table 7. Quality assessment for effectiveness studies

Study reference	QA for trials/RCTs					Score	Grading (++ 4-5; + 3; -0-2)
	Follow-up	Intention to treat?	Attrition	Groups similar or controlled?	Randomised?		
Butler et al, 1999; UK	Yes	Yes	Yes	Yes	Yes	5	++
Lennox et al, 2001; Scotland	Yes	Yes	Yes	Yes	Yes	5	++

Table 8. Quality assessment for economic studies

Study reference	QA for economic studies						Score	Grading (++ 4-6; + 3; -0-2)
	All costs of intervention included?	Market values used for costs?	Perspective reported?	Sensitivity analysis?	Reports base year adopted?	Effectiveness data from RCT or MA?		
Butler, 1999; UK	Yes	Yes	Yes	No	No	Yes	4	++
Cummings, 1989; USA	No	Don't know	Yes	Yes	Yes	Yes	4	++
Lennox, 1999; Scotland	Don't know	Don't know	Yes	No	No	Yes	2	-
Parrot, Godfrey and Kind, 2006	Yes	Yes	Yes	Yes	Yes	Yes	6	++

References

Butler, C.C., Rollnick, S., Cohen, D., Bachmann, M., Russell, I., Stott, N. (1999) Motivational consulting versus brief advice for smokers in general practice: a randomized trial, *Br J Gen PractI,*Vol.49, Nr.445, 611-6pp.

Cummings, S.R., Rubin, S.M., Oster, G. (1989) The cost-effectiveness of counseling smokers to quit, *JAMA*, Vol.261, Nr.1, 75-9pp.

Fiscella, K., Peter, P. (1996) Cost-effectiveness of the transdermal nicotine patch as an adjunct to physicians' smoking cessation counselling, *Journal of the American Medical Association*, Vol.275, Nr.16 1247-51pp.

Flack, S., Taylor, M., Trueman, P. (2007) Cost-effectiveness of interventions for smoking cessation, York Health Economics Consortium.

Healthcare Commission (2008) National findings from the 2008 Local Health Services survey: Briefing note.

HM Treasury (2003) The Green Book. Appraisal and Evaluation in Central Government. London: The Stationary Office.

HM Treasury (2008) Gross Domestic Product Deflator Series. Available from: http://www.hm-treasury.gov.uk/data_gdp_index.htm

Lancaster, T., Stead, L.(2004) Physician advice for smoking cessation, *Cochrane Database System Rev*, Nr.4, CD000165.

Lennox, S. (1999) Smoking cessation in primary care, *Br J Gen Pract*, Vol.49, Nr.443, 486pp.

Matrix (2006) Modelling the cost effectiveness of physical activity interventions, London.

NICE (2006) The diagnosis and treatment of lung cancer, *Clinical Guideline 24*, London.

Office for National Statistics (2009) General Household Survey 2007. Available from: http://www.statistics.gov.uk/Statbase/Product.asp?vlnk=5756

Parrot, S., Godfrey, C., Kind, P. (2006) Cost-effectiveness of brief intervention and referral for smoking cessation, York: The University of York. Available from: http://www.nice.org.uk/nicemedia/pdf/SmokingInterventionsEconomicsModellingReportFINAL25-01-06.pdf