NATIONAL INSTITUTE FOR HEALTH AND CLINICAL EXCELLENCE

Cost-Effectiveness of Interventions for Smoking Cessation: Mass Media Interventions

Supplementary Report

November 2021: NICE guidelines PH10 (February 2008) and PH14 (July 2008) have been updated and replaced by NG209.
The recommendations labelled [2008] or [2008, amended 2021] in the updated guideline were based on these evidence reviews.
See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

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Executive Summary

Aims

This additional analysis aimed to determine the costs and health outcomes associated with a range of hypothetical mass media interventions.

Methods

In this analysis, an intervention is deemed to be cost-effective (i.e. results in an incremental cost effectiveness ratio (ICER) of less than £20,000 per QALY) if the following statement is satisfied:

Actual number that quit as a result of the intervention > number needed to quit to beak even

The actual number needed to quit was calculated for a range of hypothetical mass media campaigns with a reach ranging from 1,000 to 1,000,000 smokers and a quit rate of 0% to 10%, by multiplying the reach by the quit rate. A number of previously undertaken mass media campaigns were also investigated, for example the John Cleese television commercials.

The number needed to quit to break even (i.e. to achieve an ICER of less than £20,000 per QALY) was calculated for each intervention as follows:

$$\frac{Cost_{int\,ervention}}{ExtraCost_{smo\,ker} + \left(£20,000 * ExtraQALY_{quitter}\right)}$$

Where:
　　　Cost intervention is the cost of the mass media campaign
　　　ExtraCost smoker is the additional cost of a smoker
　　　ExtraQALY quitter is the additional QALYs per quitter

The cost of the hypothetical intervention was varied from £100,000 to £10,000,000. The cost of the 'real' campaigns varied from £500,000 to £4,097,816. The additional cost and QALYs of a smoker, compared to a non-smoker, were calculated from the original model and the reader is referred to the previous report for a full description of the model's methods[1].

Findings and Conclusions

This analysis allows the user to determine, for any given campaign spend, the number of additional quitters (over and above the background quit rate) required for a mass media campaign to be cost-effective (based on a threshold of £20,000 per QALY). The UK mass media campaigns studied were shown to be cost-effective providing they resulted in approximately 150-200 additional quitters with the 'No Smoking Day' shown to be highly cost-effective.

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[1] Flack S, Taylor M & Trueman P. *Cost-Effectiveness of Interventions for Smoking Cessation.* Report to NICE, 2007.

Section 1: Introduction and Methods

1.1 INTRODUCTION

This additional analysis aimed to determine the cost-effectiveness of mass media a range of hypothetical interventions.

Mass media campaigns (including 'No Smoking Day') seek to achieve a range of positive outcomes including influencing public opinion and social norms around smoking, generating national and local publicity and action on smoking as well as encouraging and supporting smokers to stop smoking.

1.2 METHODS

Actual number that quit due to a campaign

A range of mass media campaigns were considered, with a reach ranging from 1,000 to 1,000,000 smokers and a quit rate of 0% to 10%. Table 1.2 shows the number of smokers who would quit as a result of each intervention.

Table 1.2:   Number of smokers who quit

		Reach of mass media campaign (smokers)			
		1,000	**10,000**	**100,000**	**1,000,000**
Proportion of smokers quitting	**0%**	0	0	0	0
	1%	10	100	1,000	10,000
	2%	20	200	2,000	20,000
	3%	30	300	3,000	30,000
	4%	40	400	4,000	40,000
	5%	50	500	5,000	50,000
	6%	60	600	6,000	60,000
	7%	70	700	7,000	70,000
	8%	80	800	8,000	80,000
	9%	90	900	9,000	90,000
	10%	100	1,000	10,000	100,000

1.2.1 Number needed to quit

The number needed to quit to break even (i.e. to achieve an ICER of less than £20,000 per QALY) was calculated as follows:

$$\frac{Cost_{intervention}}{ExtraCost_{smoker} + \left(£20,000 * ExtraQALY_{quitter}\right)}$$

Where:

$Cost_{intervention}$ is the cost of the mass media campaign
$ExtraCost_{smoker}$ is the additional cost of a smoker
$ExtraQALY_{quitter}$ is the additional QALYs per quitter

The cost of the hypothetical interventions was varied from £100,000 to £10,000,000. Costs of real interventions were also included in the analysis.

The original cohort simulation model was used to provide an estimate of the additional costs and QALYs of a smoker, compared to a quitter[2], see Table 1.1.

Each cycle, smokers and former smokers face a probability of five co-morbidities included:

- Lung cancer;
- Coronary heart disease (CHD);
- COPD;
- Myocardial infarction (MI);
- Stroke.

Table 1.1 shows that there is an additional cost of £1,777 and a reduction in QALYs of 0.91 associated with a smoker. As in the original model, during each cycle smokers could either quit (become former smokers), remain smokers or die; and former smokers could either relapse (become smokers), remain as quitters or die.

Table 1.1: Lifetime cost and QALYs of a smoker and non-smoker

	Cost	QALYs	LYs
Smoker	£7,268	11.88	29.97
Non smoker	£5,491	12.79	32.01
Additional impact due to smoking	**£1,777**	**-0.91**	**-2.03**

1.2.2 Background quit rate

The analysis was run for an annual background quit rate of 2% (i.e. a six-month background quit rate of 1.01%).

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[2] Flack S, Taylor M & Trueman P. *Cost-Effectiveness of Interventions for Smoking Cessation.* Report to NICE, 2007.

Section 2:   Results

2.1   HYPOTHETICAL INTERVENTIONS

Table 2.1 shows, for a range of costs, the additional number of quitters required for the campaign to be cost-effective. Figure 2.1 allows the user to see for any given campaign the additional number of quitters required for the intervention to be cost-effective (based on a threshold of £20,000 per QALY).

For example, Table 2.1 and Figure 2.1 show that if a campaign costs £100,000 five smokers need to quit (over and above the background quit rate) for the intervention to result in a cost per QALY of <£20,000.

Table 2.1:   Hypothetical mass media campaigns

Cost of the campaign	Number needed to quit to give a cost per QALY of <20,000
£100,000	5
£500,000	25
£1,000,000	50
£5,000,000	250
£10,000,000	500

Figure 2.1:   Mass media campaigns
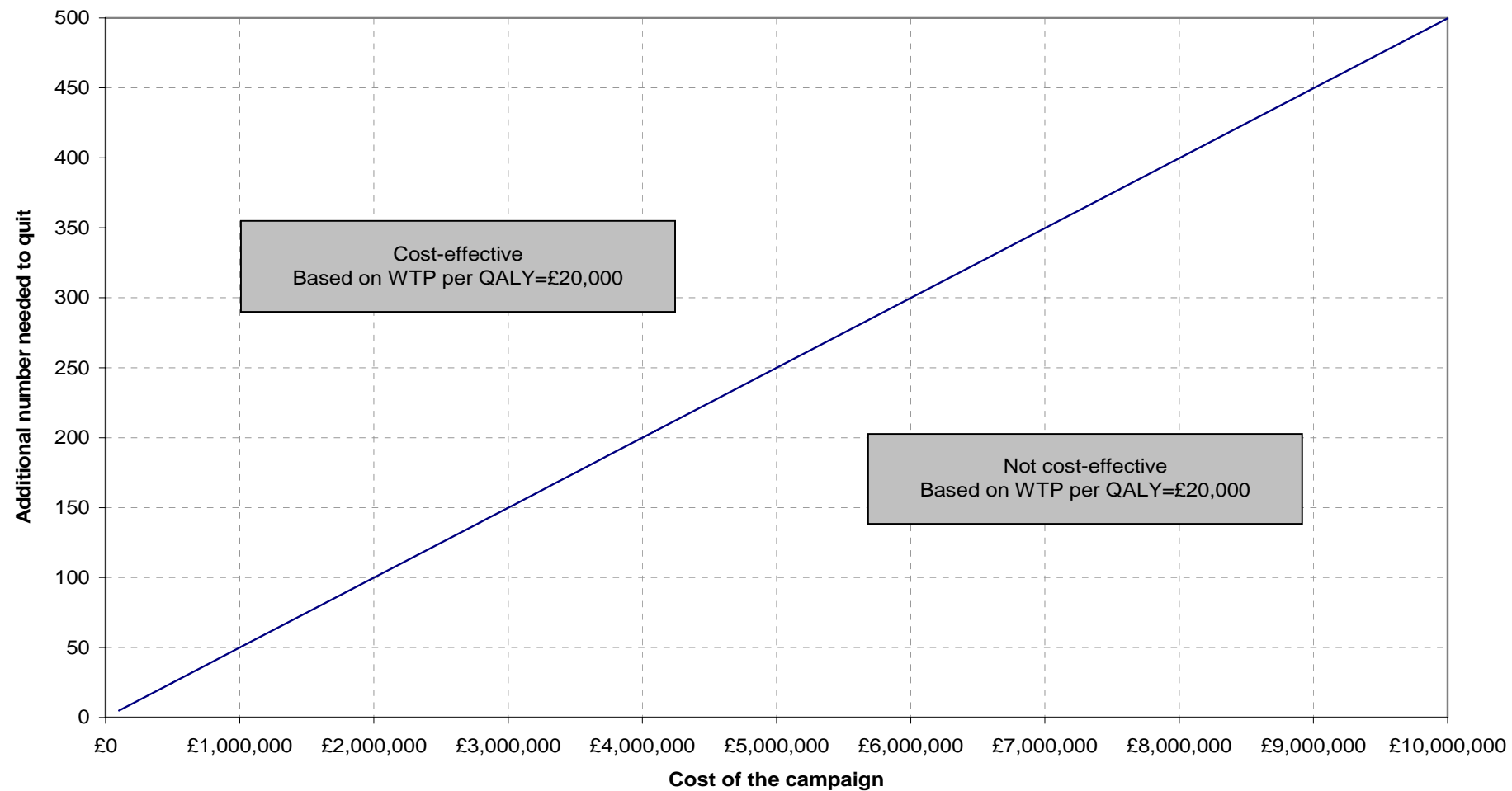
2.2   INTERVENTIONS

This section discusses the cost-effectiveness of UK mass media interventions. Table 2.2 summaries the main aspects of the campaigns.

Until the mid 1990s 'No Smoking Day' was the leading smoking cessation campaign in the UK [1]. An evaluation of the 'No Smoking Day' was undertaken by Owen and Youdan, 2006 [1]. The study found that three months after the event 0.7% of all smokers were still not smoking (85,000 quitters). It was assumed that the background quit rate on the 'No Smoking Day' was zero. Only a small proportion of smokers were compliant with the 'No Smoking Day', 11% of whom were still not smoking more than three months after the day. To be able to use the 11% figure an assumption of complete compliance would have to be made. The cost of the campaign was approximately £500,000. By using Figure 2.1 it can be seen that the 'No Smoking Day' is highly cost-effective. However, if No Smoking Day were to have simply brought forward the background quits for the following 9 to 12 months (and had not resulted in any "new" quitters), then it would not have been cost-effective. The current analysis allows us to recognise how many "new" quitters No Smoking Day would need to gain in order to be cost-effective. For the cost of £500,000, Figure 2.1 demonstrates that only 25 "new" quitters would be required. Those who fund No Smoking Day would have to make a judgement about whether they thought this achievement would be feasible.

The *'Breath of Fresh Air Tackling Smoking Through the Media'* report published by the Health Development Agency [3] provides details of five mass media campaigns that were carried out between 1992 and 1999:

- John Cleese (1995/1995), television commercials;
- Break free (1995/1996), television commercials and supporting posters;
- Quit for life (1996/1997, television and radio campaign;
- Testimonial 1 (1997/1998), television, radio and press campaign;
- Testimonial 2 (1998/1999), television, radio and press campaign.

This report does not provide details of the additional number of smokers that quit as a result of these campaigns, making it impossible to tell if the campaigns were cost-effective. Figure 2.1 shows the minimum number of additional smokers that need to quit for each campaign to be cost-effective, see Table 2.2.

McVey and Stapleton [2] provide further detail of the John Cleese campaign. They show that, by 18 months, 9.8% of smokers have quit. However the reach of the campaign is not stated and, therefore, the actual number of smokers that quit cannot be calculated. However, Figure 2.1 shows that, so long as 205 additional smokers had quit, then the campaign would have been cost-effective.

Table 2.2:   Mass media campaigns

Intervention	Cost	Additional smokers needed to quit	Quitting evidence	Reference
No Smoking Day	£500,000	25	Three months after the Day approximately 85,000 smokers were still not smoking.	Owen and Youdan [1]
John Cleese	£4,097,816*	205	Phase I: 6.6% quit, reach unknown. Phase I and II: by 18 months 9.8% quit, reach unknown.	McVey and Stapleton [2] Health Development Agency [3]
Break free	£2,994,509*	150	None stated	Health Development Agency [3]
Quit for life	£3,197,919*	160	None stated	Health Development Agency [3]
Testimonials 1	£2,788,523*	139	None stated	Health Development Agency [3]
Testimonials 2	£3,501,747*	175	None stated	Health Development Agency [3]

* Inflated to 2006

Section 3:   Discussion and Conclusions

3.1   MAIN FINDINGS AND CONCLUSIONS

This analysis allows the user to determine, for any given campaign spend, the number of additional quitters (over and above the background quit rate) required for a mass media campaign to be cost-effective (based on a threshold of £20,000 per QALY). The UK mass media campaigns studied were shown to be cost-effective providing they resulted in approximately 150-200 additional quitters.

3.2   DISCUSSION

The 'No Smoking Day' resulted in 85,000 quitters. However, there is no evidence to say whether these smokers were additional quitters or whether they would have quit anyway.

For example, in any given month a certain number of smokers would have quit (this is the background quit rate). After seeing the 'No Smoking Day' advertised these smokers may have decided that this would be their quit day, resulting in the same number of smokers quitting as would have happened without the 'No Smoking Day'.

3.3   CONCLUSION

This analysis has shown that UK mass media campaigns have the potential to be cost-effective providing they resulted in approximately 150-200 additional quitters. Although it is not known whether any of these campaigns actually result in any additional quitters, funders and decision makers are able to make a judgement about the cost-effectiveness of the campaigns on the basis of the numbers they think would be the additional quitters. Nationwide, 200 additional quitters would represent much fewer than 1% of the total "background" quitters in any one year.

References

1. Owen L Youdan B. 22 Years On: The Impact and Relevance of the UK No Smoking Day. *Tobacco Control.* 2006; **15** 19-25.

2. McVey D Stapleton J. Can anti-smoking television advertising affect smoking behaviour? Controlled trail of the Health Education Authority for England's anti-smoking TV campaign. *Tobacco Control.* 2000; **9** 273-282.

3. Grey A, Owen L, Bolling K. *A breath of fresh air tackling smoking through the media.* Health Development Agency, 2000.