

## National mass media campaigns to reduce population levels of obesity

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: national mass media campaigns to reduce population levels of obesity. The full report of the study is available from the [H.E.L.P.](#) website.

### Summary

Description of the intervention
A health education campaign undertaken by the BBC: 'Fighting Fit, Fighting Fat' (FFFF). The campaign spanned over seven weeks of numerous peak and day-time programming across BBC One and Two, BBC Radio 2 and local BBC radio programmes. FFFF was supported by a website, Ceefax pages, a book, a video, the Radio Times and telephone lines for further information. People were invited to register and buy a pack containing a self-help guide for lifestyle change (Miles et al, 2001).

Criteria	Measure	Value	Certainty
<b>1. Reach</b>			
Percentage of population affected by the condition and that could potentially benefit from the intervention.	Number of individuals receiving intervention as a percentage of adult population in catchment area (Miles et al, 2001 and Office for National Statistics, 2005)	0.06%	★★
<b>2. Inequality score</b>			
Ratio of the percentage of disadvantaged population to the percentage of the general population that could potentially benefit from the intervention.	Assumption	1	★
<b>3. Cost-effectiveness</b>			
Cost of the intervention per <a href="#">QALY</a> gained (in £2007/08)	See <a href="#">cost-effectiveness</a>	£100	★★
Net cost of the intervention per <a href="#">QALY</a> gained (in £2007/08)	See <a href="#">cost-effectiveness</a>	-£3,290	★★
Timing of benefits	<a href="#">QALY</a> gain and cost savings are estimated to occur in the long-run (5 years or more after the intervention).		
<b>4. Affordability</b>			
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:

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

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:

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

## Cost effectiveness

**Cost.** National mass media campaigns to reduce population levels of obesity cost on average £73.6 per person (£2007/08).

**Effect.** National mass media campaigns to reduce population level of obesity increase adults' chances of becoming physically active by 16.9 per cent. This effect was obtained from a [review](#) undertaken to identify evidence on the effectiveness and cost-effectiveness of national mass media campaigns to reduce population levels of obesity.

**Benefits.** The benefits of the intervention derive from becoming physically active. Two types of benefits are considered: QALYs and health care cost savings.<sup>1</sup> Based on the QALYs gained and the health care cost savings of physical activity, a 16.9 per cent increase in the chances of becoming physically active is associated with the following benefits:

- An additional 0.736 QALYs per person
- Cost savings of £2,494 per person (£2007/08)

Please refer to the [decision model](#) for details on how the QALY gain and cost savings were calculated.

<sup>1</sup> 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

The cost-effectiveness estimates were calculated by drawing the following parameters from the literature:

- The unit cost of the intervention (Table 1).
- The effect of the intervention on the chances of adults' becoming physically active (Table 1).
- The benefits associated with becoming physically active, in terms of quality of life and health care cost savings (Matrix, 2006).

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

Description	Value	Calculation and source
Cost of intervention	£73.6	This was estimated by dividing the total cost of the campaign (£2,462,651) as reported by Hammond (1999) with the number of individuals who registered with the campaign (Miles et al, 2001).
P(if intervention, becoming physically active)	0.169	This probability is based on a 16.9% change in the proportion of participants classified as active after the intervention (Miles et al, 2001). See evidence <a href="#">review</a> .
P(if no intervention, becoming physically active)	0.000	Given that the effect of the intervention measures incremental effect, the probability of becoming active for those not receiving the intervention is assumed zero. See evidence <a href="#">review</a> .

The benefits of the intervention were obtained by adjusting the results of an economic model built by Matrix (2006) to the effect size achieved by this particular intervention. The model developed by Matrix (2006) estimated the QALY gain and cost savings associated with becoming physically active, as described below:

- Individuals receiving the intervention are assumed to be 45 years old on average.
- The effect of the intervention is given by a change in adults' chances of becoming physically active.
- The model assumes a 50 per cent drop off in the number of people increasing their physical activity levels as result of the intervention, and then assumes that the resulting increase in physical activity is maintained long enough to obtain health benefits of that physical activity level.
- Physical activity is assumed to be associated with reduced probabilities of experiencing the following four diseases: type II diabetes; stroke: coronary heart diseases (CHD); and colon cancer.
- The four diseases have impacts in terms of quality of life and health care costs.
- The impacts on quality of life were estimated by comparing the EQ-5D scores for individuals experiencing the diseases of different age groups and genders, with average quality of life scores for different age groups and genders. The impact on quality of life of experiencing colon cancer was assumed to be the same as the average for all cancers.
- The impacts on health care costs were estimated based on the costs of treating type II diabetes, stroke and CHD. The costs of colon cancer were not included in the estimates given that no reliable annual cost for the treatment colon cancer could be identified.

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).

## Effectiveness evidence

A literature review was undertaken by [Bazian](#) to identify evidence on the effectiveness and cost-effectiveness of national mass media campaigns to reduce population levels of obesity. 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 national mass media campaigns to reduce population levels of obesity identified one before-after study. Table 2 provides the following details of the studies identified:

- Population
- Intervention
- Results

The review of the evidence on the cost-effectiveness of national mass media campaigns to reduce population levels of obesity identified one economic study. Table 3 provides the following details of the studies identified:

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

Table 4 and Table 5 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 controlled 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 2. Effectiveness of national mass media campaigns to reduce population levels of obesity**

Study reference	Population	Intervention	Results
<p>Miles et al, 2001; UK</p> <ul style="list-style-type: none"> <li>▪ before-after study</li> </ul>	<p>6,000 (random sample of the total 33,474 campaign registrants) adults who registered with the FFFF campaign were sent a postal questionnaire survey at the start of the campaign and 5 months later. 3,661 respondents completed the baseline questionnaire and 2,112 (58%) of these completed the follow-up evaluation questionnaire 5 months later. The majority were classified as 'overweight' or 'obese'</p>	<p><i>Intervention</i></p> <p>A multi-component campaign to raise public awareness of the need for obesity prevention, healthy eating and increased physical activity among UK adults. The campaign was broadcast during peak and daytime programming across BBC 1 and BBC 2, BBC radio 1 and local BBC radio programmes, and was supported by a website, Ceefax, book, video, telephone lines and national and regional press coverage.</p> <p><i>No control</i></p>	<ul style="list-style-type: none"> <li>▪ Mean change in weight from before to after intervention: -2.3kg (95% CI -2.2 to 2.5)</li> <li>▪ BMI change: 0.88 (95% CI 0.82 to 0.94)</li> <li>▪ Change in proportion eating 5 or more portions of fruit and vegetables per day (%): +13% (p&lt;0.001)</li> <li>▪ Change in proportion classified as 'active': +16.9% (p&lt;0.001)</li> </ul>

**Table 3. Cost-effectiveness of national mass media campaigns to reduce population levels of obesity**

Study reference	Population, intervention and model	Perspective, discounting, inflation, cost year	Utility/benefit	Unit costs	Efficiency
<p>Dalziel and Segal, 2007; UK</p> <ul style="list-style-type: none"> <li>▪ Cost effectiveness of FFFF intervention (see above)</li> </ul>	<p>State transition Markov models using data from original publication of effects of BBC's Fighting fat, fighting fit campaign. One-year cycle length. For details of intervention – see above.</p>	<ul style="list-style-type: none"> <li>▪ Social perspective</li> <li>▪ 5% discounting</li> <li>▪ No adjustment for inflation</li> <li>▪ Cost year: USD and GBP2006</li> </ul>	<p>0.0546 QALYs gained</p>	<p>US\$231/£124 (incremental cost per person)</p>	<p>US\$12,200 / £6500 per changer (obese)</p> <p>US4200/£2300 per QALY gained (associated with great uncertainty. Possible performance varying from less than £10 per QALY to intervention dominated, reflecting the poorer quality and uncertainty in the trial results.</p>

**Table 4. 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?		
Miles et al, 2001; UK	Yes	No	No	Yes	No	3	+

**Table 5. 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?		
Dalziel & Segal, 2007; UK	Don't know	Don't know	Yes	Yes	Yes	No	3	+

## References

Dalziel, K., Segal, L. (2007) Time to give nutrition interventions a higher profile: cost-effectiveness of 10 nutrition interventions, *Health Promot Int*, Vol.22, Nr.4, 271-83pp.

Hammond, P. (1999) Fighting Fat, Fighting Fit, *British Medical Journal*, Vol.318, Nr.7177, 202pp. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1114689>

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](http://www.hm-treasury.gov.uk/data_gdp_index.htm)

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

Miles, A., Rapoport, L., Wardle, J., Afuape, T., Duman, M. (2001) Using the mass-media to target obesity: an analysis of the characteristics and reported behaviour change of participants in the BBC's 'Fighting Fat, Fighting Fit' campaign, *Health Educ Res*, Vol.16, Nr.3, 357-72pp.

Office for National Statistics (2005) Mid-1999 Population estimates: Estimated resident population of the United Kingdom at mid-1999. Available from: <http://www.statistics.gov.uk/statbase/xsdataset.asp?vlnk=1917&More=Y>