

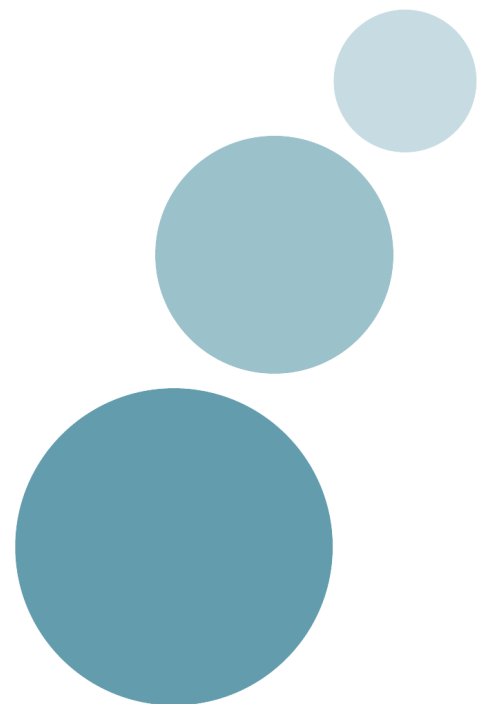


Bazian.

Department of Health

Prioritising investments in public health

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1.0 Executive summary

1.1 Objective

The Matrix Knowledge Group and Bazian were commissioned by the Department of Health to undertake research to inform the prioritisation of locally commissioned public health interventions. Specifically, the objective of the research was to review the high level evidence for the effectiveness and cost-effectiveness of interventions with potential to achieve one of the following 8 objectives:

- Reduce smoking rates and prevent harm from smoking.
- Prevent obesity, manage risk factors and address the complications of obesity.
- Prevent dangerous drinking and minimise the harm from alcohol.
- Prevent the uptake of and harm from illicit drug use.
- Reduce the incidence of STI and reduce the rates of teenage pregnancy.
- Promote breast feeding.
- Promote healthy nutrition and dietary patterns which reduce the complications of illness.
- Promote health in the elderly and prevent diseases associated with age.

It is important to note that the research conducted to answer this question, which is described in this report, was undertaken in less than one month. While the results reported here are robust, they should be considered a necessary and important – but not sufficient – input into decisions about how public health investments should be prioritised. The report concludes with recommendations for future research to improve the evidence base on which public health investment decisions are made, and recommends other domains of information that should be included in the prioritisation process.

1.2 Methods

Thirty eight candidate intervention categories were selected from a short list of international public health programme types. Three were subsequently subdivided, giving a total of forty one intervention categories. The categories were chosen to represent a range of primary and secondary prevention activities with a population, group and individual focus. Settings of interest included communities, schools, clinics and hospitals with a presumed implementation strategy that used either universal or high risk targeted approaches. Taxation and legislative changes were excluded from analysis, to retain focus on interventions that might be commissioned at the local level..

UK knowledge portals, guideline sites, health technology assessment and systematic review databases were searched for recommended interventions within the programme category. Following first pass appraisal of 1094 documents, the data for a common behavioural or health outcome from 97 reviews and guidelines was extracted and appraised by health research

reviewers. Effect size, reliability and relevance were scored using adapted international scoring schemes. These scores were combined to rate the effectiveness of the interventions.

Recent reviews of economic evaluations of public health interventions were used to identify relevant studies, from which evidence of the cost, effect, health gain, and public sector costs savings associated with the interventions was extracted. Cost-effectiveness, reliability and relevance were scored using adapted international scoring schemes. These scores were combined to rate the cost-effectiveness of the interventions. An intervention was defined as very cost-effective if its benefits (including improvements in health related quality of life and public sector costs saved) were more than twice as great as its costs, and cost-effective if its benefits were between one and two times its cost.

Further detail on the scales used to assess the effectiveness and cost-effectiveness of the interventions are available in section 3.0.

1.3 Results

Table 1 summarises the intervention ratings produced by the review. It is important to note that, because of the different estimates of effect used by studies within different intervention categories, comparison across effectiveness ratings are only valid within intervention categories (for example, it is not valid to directly compare effectiveness ratings for interventions for “smoking cessation” with those for “breastfeeding”). However, as the economic rating is based on standardised measures (net-benefit) it is valid to use this rating to compare both between and within categories.

Table 1 demonstrates the following:

- **Smoking cessation:** Drug therapies show the best general effectiveness, and some specific interventions (bupropion and nicotine replacement therapy) within this category have also been demonstrated to be cost-effective. A number of other interventions were demonstrated to be effective, but there was insufficient economic evidence to comment on their cost-effectiveness.
- **Preventing obesity:** Intensive targeted interventions (multifactor targeted interventions, community based intervention to increase physical activity) and two universal interventions (school based programmes and mass media campaigns) were generally effective though with low or moderate effect sizes. There was insufficient evidence to say if population screening programmes coupled with treatment for obesity were effective. The economic evidence suggests that school-based programmes are cost-effective. However, there was insufficient data to comment on the cost-effectiveness of other interventions.
- **Preventing dangerous drinking:** Evidence on a diverse range of interventions was identified, including primary preventive universal programmes (mass media campaigns): low intensity interventions (brief interventions in primary care, school based classroom sessions) and high intensity interventions for high risk drinkers or dependent drinkers (drugs, psychological therapies, motivational counselling including twelve step

programmes). Other than intensive motivational counselling, for which there was insufficient data, there was evidence that all the interventions within this category were effective. Economic evidence demonstrated that brief interventions for high risk drinkers in primary care were cost-effective. There was insufficient data to conclude on the cost-effectiveness of the other interventions in this category.

- **Preventing illicit drug use:** There was reliable evidence of a large effect for school based programmes that aimed to prevent uptake of drugs in school and for methadone and some other substitution programmes. Economic evidence was identified that demonstrates that a school-based life skills programme aiming to reduce the amount of cocaine consumed produced public sector savings that exceed the cost of the intervention. There was insufficient data to conclude on the cost-effectiveness of the other interventions in this category.
- **Reducing STIs and teenage conception:** There was evidence that individual risk counselling, and screening and testing were both effective and cost-effective. Population screening programmes for STI (chlamydia and gonorrhoea) when combined with effective treatments were highly effective at reducing pelvic inflammatory disease and produced public sector savings exceeded the costs of the programme. Screening for HIV, coupled with effective management, produces a lifetime gain in quality of life that justified its cost.
- **Promoting breastfeeding:** The review identified relatively good evidence for the effectiveness of antenatal or postnatal education to either promote initiation of breast feeding or to lengthen the duration of breastfeeding for the women who had started. Though the cost of these interventions could be low, there was insufficient evidence to determine whether they were cost-effective.
- **Promoting healthy nutrition:** There was evidence that intensive interventions for promoting lifestyle change was effective, especially when directed at preventing diabetes in people with impaired glucose tolerance by using high intensity dietary advice, educational and physical activity intervention delivered together. There was also evidence of the effectiveness of general nutritional counselling in primary care. However, economic evidence was limited in this area. Economic evidence was available for only one intervention type – nutrition counselling in primary care. However, this evidence was insufficient to conclude whether the intervention was cost-effective.
- **Health of the elderly:** There was evidence that vaccination for influenza and fall prevention programmes are both moderately effective and good value for money. The specific interventions that are useful in preventing falls invite closer inspection as strategies may target either one or multiple risk factors, and may be targeted to the individual, or begin at specific ages. There was insufficient economic evidence to comment on the cost-effectiveness of other interventions.

1.4 Conclusion

The review identified the following interventions within the 8 public health areas investigated that are both effective and cost-effective and which should, therefore, be considered in any prioritisation process:

- Drug therapies for smoking cessation, specifically NRT and bupropion.
- School-based programmes for obesity prevention, specifically interdisciplinary curricula.
- Brief interventions in primary care for high risk drinkers.
- School-based programmes to prevent illicit drug use, specifically life skills training interventions.
- Individual risk counselling to reduce STIs.
- Screening for STIs coupled with treatment.
- Vaccinations for influenza for the elderly.
- Fall prevention programmes for the elderly.

A number of other interventions were found to be effective, but there was insufficient evidence to draw conclusions regarding their cost-effectiveness. In a number of instances this was due to the review being unable to identify any economic evidence. Specifically, no economic evidence was identified for 15 of the 41 interventions. However, the analysis was unable to conclude regarding the cost-effectiveness of another 15 interventions, not because there was no data, but because the economic evidence that was identified took the form of a cost-effectiveness analysis where effectiveness was measured by change in behaviour. As it is not possible to say whether these changes are worth the cost of the intervention, the analysis is unable to conclude whether these interventions are cost-effective.

Given the tight timeframe within which this research was undertaken, these limitations are not surprising. Further research is required to overcome the limitations. It is proposed that this should include:

- **A consultative scoping phase.** Further research should involve public health experts and other stakeholders to identify and describe any interventions for study, as well as agree the criteria against which the effectiveness and cost-effectiveness of interventions should be assessed.
- **A more thorough review of the evidence.** Further research should examine lower levels of effectiveness evidence in addition to existing systematic reviews, and undertake a more thorough review of the economic evidence.
- **Preventable burden of disease.** Further research should incorporate robust methods to establish preventable burden of disease.
- **Current uptake.** Further research should incorporate robust methods to quantify the current degree of uptake of the interventions examined.
- **Inequalities.** Further research should examine the effect of interventions on inequality.
- **Modelling health gains and cost savings.** Further research should include robust modelling of longer term health outcomes, QALYs and public sector cost savings if currently unavailable in the existing literature.

Table 1: Summary of effectiveness and economic evidence

Note: Because of the different estimates of effect used by studies within different intervention categories, comparison across effectiveness ratings are only valid within intervention categories. However, as the economic rating is based on standardised measures (net-benefit) it is valid to use this rating to compare both between and within categories.

Ref	Specific description of intervention being categorised	Universal or targeted/high risk strategy	Effectiveness rating	Cost-effectiveness rating		Timing of benefits
				Public sector costs saved	Quality of life gained	
1	Smoking cessation					
1a (i)	Mass media campaigns aimed at adults	Universal	★★★	★	★	Immediate
1a (ii)	Mass media campaigns aimed at children and young people	Universal		★	★	Immediate
1b	School based programmes	Universal		★	★★	Long-run
1c	Phone counselling quitlines	Universal	★★★	★	★	Immediate
1d	Brief interventions in primary care	Targeted/high risk	★★★	★	★	Immediate
1e	Drug therapies	Targeted/high risk	★★★★	★	★★★★	Immediate
2	Obesity prevention					
2a	Mass media campaigns	Universal	★★			
2b	School based programmes	Universal	★★	★	★★★	Short-run
2c	Screening for obesity	Universal				
2d	Community based interventions to increase physical activity	Universal	★★	★	★	Immediate
2e	Multifactor targeted interventions	Targeted/high risk	★★★	★	★	Immediate
3	Preventing dangerous drinking					
3a	Mass media campaigns	Universal	★★			
3b	Brief interventions in primary care for high risk drinkers	Targeted/high risk	★★★	★★★	★	Short-term
3c	Drugs and psychological therapies for alcohol dependence	Targeted/high risk	★★★★			
3d (i)	School based programmes - classroom	Universal	★★★★	★	★	Short-term
3d (ii)	School based programmes – one on one	Universal	★★	★	★	Short-term
3e	Intensive motivational counselling	Targeted/high risk				
4	Preventing illicit drug use					
4a	School based programmes	Universal	★★★★	★★★	★	Short-run
4b	Needle and syringe exchange programmes	Targeted/high risk	★★★			
4c	Methadone and other substitution programmes	Targeted/high risk	★★★★			
4d	Screening and identification of drug users	Universal				
4e	Community based programmes for vulnerable children and young people	Universal	★★★	★	★	Immediate
5	Reducing STIs and teenage conception					
5a	Partner notification schemes for sexually transmitted infections	Targeted/high risk	★★	★	★	Immediate
5b	Individual risk counselling	Targeted/high risk	★★★	★	★★★	Don't know
5c	School based programmes	Universal		★★	★	Long-run
5d	Mass media campaigns	Universal		★	★	Long-run
5e (i)	Screening for STI (chlamydia, HIV) - screening	Secondary		★	★★	Long-run

Ref	Specific description of intervention being categorised	Universal or targeted/high risk strategy	Effectiveness rating	Cost-effectiveness rating		Timing of benefits
				Public sector costs saved	Quality of life gained	
5e (ii)	Screening for STI (chlamydia, HIV) – screening + treating	Secondary	★★★★	★★★	★	Long-run
6	Promoting breastfeeding					
6a	Mass Media campaigns	Universal				
6b	Antenatal education to promote initiation of breastfeeding	Universal	★★★★			
6c	Postnatal care for lengthening duration of breastfeeding	Universal	★★★	★	★	Immediate
7	Promoting healthy nutrition					
7a	Nutritional counselling in primary care	Targeted/high risk	★★	★	★	Immediate
7b	Intensive interventions for promoting lifestyle change	Targeted/high risk	★★★★			
7c	School nutrition schemes	Universal	★★★			
7d	Mass media campaigns	Universal				
7e	Food labelling schemes	Universal				
8	Health of the elderly					
8a	Vaccination for influenza	Universal	★★★	★★★	★★★	Immediate Short-run
8b	Vitamin D and calcium supplementation for bone health	Universal	★★	★	★	
8c	Screening for osteoporosis	Universal				
8d	Community based vision screening	Universal				
8e	Fall prevention	Universal	★★★	★★★	★	Short-run

Key to ratings (effectiveness):

- ★★★★ There is reliable evidence of a large effect
- ★★★ There is uncertain evidence of a large effect or reliable evidence of a moderate effect
- ★★ There is uncertain evidence of a moderate effect or reliable evidence of a small effect
- ★ There is uncertain evidence of a small effect

Not rated: There is insufficient or no evidence

Key to ratings (economics):

- ★★★★ There is reliable evidence that the intervention is very cost-effective
- ★★★ There is uncertain evidence that the intervention is very cost-effective or reliable evidence that the intervention is cost-effective
- ★★ There is uncertain evidence that the intervention is cost-effective
- ★ There is insufficient or contradictory evidence

Not rated: No economic evidence was identified

2.0 Introduction

The Matrix Knowledge Group and Bazian were commissioned by the Department of Health to undertake research to inform the prioritisation of locally commissioned public health interventions. Specifically, the objective of the research was to assess the effectiveness and cost-effectiveness of interventions with proven potential to achieve one of the following 8 objectives:

- Reduce smoking rates and prevent harm from smoking.
- Prevent obesity, manage risk factors and address the complications of obesity.
- Prevent dangerous drinking and to minimize harm from alcohol.
- Prevent the uptake of and harm from illicit drug use.
- Reduce the incidence of STI and to reduce the rates of teenage pregnancy.
- Promote breast feeding.
- Promote healthy nutrition and dietary patterns which reduce the complications of illness.
- Promote health in the elderly and prevent diseases associated with age.

Given the very tight timeframe within which the research had to be undertaken – less than one month was available to do the work – a review of existing evidence was conducted to answer this question. This report describes the approach undertaken to identify interventions within the above 8 areas on which the review would focus; the method adopted to identify, review and synthesise the evidence on the effectiveness and cost-effectiveness of these interventions; and the results of the synthesis of this evidence. The report concludes with recommendations for where the evidence suggests that public health resources might be productively targeted. The report also describes how this research can be built upon to provide more a robust answer to the research question than was possible with the limited timeframe available to this project.

3.0 Method

The methodology described in this section was designed to assess the effectiveness and cost-effectiveness of 38 public health interventions within a one-month timeframe. Given the time available, we recommend that the present project be seen as a “triaging” process, which identifies and prioritises areas where a second stage research project can provide robust policy recommendations. Specifically, the method outlined below can be taken to suggest which interventions are broadly likely to be effective and cost-effective, and which should, therefore be considered as candidates for prioritisation. However, a second stage of work is needed to more robustly describe the magnitude of those benefits, the cost-effectiveness of the interventions, the applicability of the interventions to local populations, and the extent to which the interventions are already deployed. The discussion section of this report provides some suggestions about where further research can productively build on the start made by this project.

This section of the report describes the methods employed to assess the effectiveness and the cost-effectiveness of public health interventions.

3.1 Selection of interventions for investigation

A streamlined consensus rating method was employed to identify interventions which had demonstrated potential to achieve one of the 8 objectives outlined in the introduction. Further detail on the method employed is available in appendix 1. Following the application of the consensus rating method, 5 intervention were identified for further investigation in each of the 8 areas, except for promoting breastfeeding for which 3 interventions were identified.

3.2 Review of evidence of effectiveness

It was agreed with the client that the timescale and resource constraints would mean a restriction of the search to certain databases. In April 2008 a search for all reviews of preventive interventions within the eight domains was undertaken on the following databases:

- Cochrane Database of Systematic Reviews (search)
- Health Technology Assessment (HTA) Database (including NCCHTA) (search)
- National Library for Health (includes NICE, SIGN, DH, NHS screening programmes) (site searched and browse)
- U.S. Preventive Services Task Force (site searched and browse)

This high level search identified 1087 documents. Of these, 91 documents both addressed a preventive activity and were written in English. To this was added 30 documents that had been found through reference searching or unsystematic searching; leaving a total of 121 documents referenced in this report.

From the 121 documents, a lead review was identified for each intervention category that was comprehensive, based on an available published systematic review or HTA, and applicable to or authored in the UK. If no such reviews were identified or if the data for magnitude of change to behaviour or risk factor was not available in the review identified, then alternative sources of evidence, usually Cochrane reviews, were used to provide an estimate of the effect size.

For this “review of reviews” the threshold for inclusion was deliberately set high, so that only reviews and health technology assessments which met all the following criteria were included¹:

- Accepted health technology assessment methodology, fully reported.
- Clear questions set for the review.
- Results and evidence statements linked.
- Clear descriptions of the intervention or programmes assessed and referenced.

Three out of the ten GRADE steps (Atkins et al, 2004) were used to assess the quality of evidence and the magnitude of any benefit shown. This approach was scored according to:

- estimates of effect size (none, low, moderate, high)
- relevance of the outcome (direct or indirect)
- reliability (quality) of the underlying body of research (reliable or uncertain)

Using the above criteria, the effectiveness of the interventions was given a final rating as described in table 2.

Table 2: Rating of intervention effectiveness

Rating	Effect size estimate	Relevance	Reliability
****	High	Direct	Reliable
***	High	Indirect	or Minor uncertainty
***	Moderate	Direct	Reliable
**	Moderate	Indirect	or Minor uncertainty
**	Low	Direct	Reliable
*	Low	Indirect	or Minor uncertainty
Not rated	Insufficient	Indirect	or Major uncertainty
Not rated	None	Direct	Reliable

3.3 Review of evidence of cost-effectiveness.

The following sources were searched for studies of the cost-effectiveness of public health interventions in the 8 domains identified above: two recent reviews of economic evaluations of public health interventions (Drummond et al, 2006; and McDaid and Needle, 2006); and reviews undertaken as part of NICE technology and public health intervention appraisals.

Studies were included in the review if they met the following criteria:

¹ The criteria are based on those that are common to recognised standards in systematic review and guideline development, such as QUOROM (Moher et al, 2006) and AGREE (AGREE Collaboration, 2003)

- The study had to include at least one of the final list of 38 preventive intervention categories.
- The study had to be published in the English language
- The study had to have been undertaken in a western context. That is, it had to have been undertaken in Europe, North America, Australia or New Zealand.

As a result of the search, 55 studies were identified that met the above criteria. Each of these papers was read by two economists, and data was extracted from the studies on the intervention and the counterfactual, the population, the method used to measure effect, estimates of effect, the method used to measure costs and the value of effects, and estimates of costs and benefits.

Evidence of the cost-effectiveness of 22 of the 38 interventions was identified. Based on the data extracted from the studies, each of the 22 interventions was scored according to the following criteria:

- **Cost-effectiveness:** whether the value of the benefits of the intervention exceeded its costs. Specifically, an intervention was judged very cost-effective if its benefits were at least twice as great as its cost, and cost-effective if its benefits were between one and two times as great as its cost. The assessment of cost-effectiveness was undertaken twice. First, defining benefits as public sector costs saved. Second, defining benefits as gains in health related quality of life (Quality Adjusted Life Years (QALY) gained were converted into monetary amounts using the lower end of NICE's cost per QALY gained of £20,000 per QALY).
- **Relevance:** whether the evidence on the cost-effectiveness of the intervention was assessed came from the UK.
- **Reliability:** whether the evidence on which the cost-effectiveness of the intervention was assessed was of good quality.

Further detail on these criteria is available in appendix 1. Using the above criteria, the cost-effectiveness of the interventions was given a final rating as described in table 3.

Table 3: Rating of intervention cost-effectiveness

Rating	CE estimate	Relevance	Reliability
****	Very CE	Relevant	Reliable
***	Very CE	Uncertain	
***	CE	Relevant	Reliable
**	CE	Uncertain	
*	Don't know / uncertain	Any	
Not rated	Not CE	Any	

4.0 Summary of findings

Table 4 presents a summary of the intervention ratings produced by the review. Tables 5 and 6 provide more detail on the nature and quality of the effectiveness and cost-effectiveness evidence identified by the review.

It is important to note that, because of the different estimates of effect used by studies within different intervention categories, comparison across effectiveness ratings are only valid within intervention categories. However, as the economic rating is based on standardised measures (net-benefit) it is valid to use this rating to compare both between and within categories.

It is also important to note that the different sources of data on effectiveness and cost-effectiveness means that it is possible that these measures are in conflict with each other. The best evidence for effectiveness comes from systematic reviews of a number of studies of an intervention, often implemented in different contexts and for different populations. The best evidence for the health economic analyses often comes from specific interventions, delivered in specific locations with costs that can be accurately attributed. The inherent tension between the general and the specific means that the interventions being compared in the effectiveness part of this study can be subtly different from the single intervention that has been shown to be cost effective.

Although it is possible at a high level to compare the rating implied by these results across effectiveness and cost effectiveness, within categories and between categories, a cautious approach is recommended since there are often differences in population, intervention or outcome measurement that may explain some of the differences in scoring. Furthermore the counterfactual, comparison, interventions in the cost effectiveness analysis may be “current practice” and for these a high score will indicate the value from consideration of incremental benefit gained and the expected cost from a new intervention when substituted for the old. For the systematic reviews of effectiveness the comparator used is often placebo or no care.

Smoking

Amongst the programmes and interventions that reduce smoking and harms from smoking, drug therapies show the best general effectiveness. Some specific interventions (bupropion and NRT) within this category have also been evaluated in economic analysis, these demonstrate that the monetary value of the health gains substantially exceed interventions cost.

There was limited evidence that specific school-based programmes were cost-effective. Specifically, the value of the gains in health related quality of life associated with the programmes exceeded their costs. However, uncertainties remain around the general effectiveness of school based programmes. This is largely because these programmes contain a wide variety of interventions. Some but not all school based programmes are effective, and the exact components and theoretical basis of the school based intervention which determine success are unknown.

Other general interventions within this category (brief counselling in primary care, quitlines and mass media campaigns aimed at adults) also seem effective. However, there was insufficient evidence to draw conclusions regarding the cost-effectiveness of these interventions.

Obesity

Amongst the programmes and interventions that prevent obesity and reduce the complications of obesity, the more intensive targeted interventions (multifactor targeted interventions, community based intervention to increase physical activity) and two universal interventions (school based programmes and mass media campaigns) were generally effective, though with low or moderate effect sizes.

There was insufficient evidence to say if population screening programmes coupled with treatment for obesity were effective as the assumption that people identified as overweight might subsequently lose weight is unproven.

Some specific examples of school based interventions have been demonstrated to show health related quality of life gains and reduced public sector costs that justify the low cost of adding obesity prevention to usual curriculum and physical activity class.

Economic evidence was identified on community-based interventions to increase physical activity and multifactorial targeted interventions. However, the analysis was unable to conclude whether these interventions were cost-effective.

No economic evidence was identified for mass media campaigns and screening to reduce obesity.

Alcohol

The interventions to prevent dangerous drinking and to minimise the harm from alcohol use were diverse. Those evaluated included those that are best thought of as primary preventive universal programmes (mass media campaigns): low intensity intervention (brief interventions in primary care, school based classroom sessions) and high intensity interventions for high risk drinkers or dependent drinkers (drugs psychological therapies, and motivational counselling including twelve step programmes).

Other than intensive motivational counselling, for which there was insufficient data, there was evidence that all the interventions within this category were effective. The strongest certain effect was demonstrated by the more intensive drug and psychological interventions and by classroom-based school programmes.

Economic evidence demonstrated that brief interventions for high risk drinkers in primary care were very cost-effective. Specifically, the public sector costs saved following the intervention were more than double the cost of the intervention. There was insufficient data to conclude on the cost-effectiveness of the other interventions in this category.

Table 4: Summary of effectiveness and economic evidence

Note: Because of the different estimates of effect used by studies within different intervention categories, comparison across effectiveness ratings are only valid within intervention categories. However, as the economic rating is based on standardised measures (net-benefit) it is valid to use this rating to compare both between and within categories.

Ref	Specific description of intervention being categorised	Universal or targeted/high risk strategy	Effectiveness rating	Cost-effectiveness rating		Timing of benefits
				Public sector costs saved	Quality of life gained	
1	Smoking cessation					
1a (i)	Mass media campaigns aimed at adults	Universal	★★★	★	★	Immediate
1a (ii)	Mass media campaigns aimed at children and young people	Universal		★	★	Immediate
1b	School based programmes	Universal		★	★★	Long-run
1c	Phone counselling quitlines	Universal	★★★	★	★	Immediate
1d	Brief interventions in primary care	Targeted/high risk	★★★	★	★	Immediate
1e	Drug therapies	Targeted/high risk	★★★★	★	★★★★	Immediate
2	Obesity prevention					
2a	Mass media campaigns	Universal	★★			
2b	School based programmes	Universal	★★	★	★★★	Short-run
2c	Screening for obesity	Universal				
2d	Community based interventions to increase physical activity	Universal	★★	★	★	Immediate
2e	Multifactor targeted interventions	Targeted/high risk	★★★	★	★	Immediate
3	Preventing dangerous drinking					
3a	Mass media campaigns	Universal	★★			
3b	Brief interventions in primary care for high risk drinkers	Targeted/high risk	★★★	★★★	★	Short-term
3c	Drugs and psychological therapies for alcohol dependence	Targeted/high risk	★★★★			
3d (i)	School based programmes - classroom	Universal	★★★★	★	★	Short-term
3d (ii)	School based programmes – one on one	Universal	★★	★	★	Short-term
3e	Intensive motivational counselling	Targeted/high risk				
4	Preventing illicit drug use					
4a	School based programmes	Universal	★★★★	★★★	★	Short-run
4b	Needle and syringe exchange programmes	Targeted/high risk	★★★			
4c	Methadone and other substitution programmes	Targeted/high risk	★★★★			
4d	Screening and identification of drug users	Universal				
4e	Community based programmes for vulnerable children and young people	Universal	★★★	★	★	Immediate
5	Reducing STIs and teenage conception					
5a	Partner notification schemes for sexually transmitted infections	Targeted/high risk	★★	★	★	Immediate
5b	Individual risk counselling	Targeted/high risk	★★★	★	★★★	Don't know
5c	School based programmes	Universal		★★	★	Long-run
5d	Mass media campaigns	Universal		★	★	Long-run
5e (i)	Screening for STI (chlamydia, HIV) - screening	Secondary		★	★★	Long-run

Ref	Specific description of intervention being categorised	Universal or targeted/high risk strategy	Effectiveness rating	Cost-effectiveness rating		Timing of benefits
				Public sector costs saved	Quality of life gained	
5e (ii)	Screening for STI (chlamydia, HIV) – screening + treating	Secondary	★★★★	★★★	★	Long-run
6	Promoting breastfeeding					
6a	Mass Media campaigns	Universal				
6b	Antenatal education to promote initiation of breastfeeding	Universal	★★★★			
6c	Postnatal care for lengthening duration of breastfeeding	Universal	★★★	★	★	Immediate
7	Promoting healthy nutrition					
7a	Nutritional counselling in primary care	Targeted/high risk	★★	★	★	Immediate
7b	Intensive interventions for promoting lifestyle change	Targeted/high risk	★★★★			
7c	School nutrition schemes	Universal	★★★			
7d	Mass media campaigns	Universal				
7e	Food labelling schemes	Universal				
8	Health of the elderly					
8a	Vaccination for influenza	Universal	★★★	★★★	★★★	Immediate
8b	Vitamin D and calcium supplementation for bone health	Universal	★★	★	★	Short-run
8c	Screening for osteoporosis	Universal				
8d	Community based vision screening	Universal				
8e	Fall prevention	Universal	★★★	★★★	★	Short-run

Key to ratings (effectiveness):

- ★★★★ There is reliable evidence of a large effect
- ★★★ There is uncertain evidence of a large effect or reliable evidence of a moderate effect
- ★★ There is uncertain evidence of a moderate effect or reliable evidence of a small effect
- ★ There is uncertain evidence of a small effect

Not rated: There is insufficient or no evidence

Key to ratings (economics):

- ★★★★ There is reliable evidence that the intervention is very cost-effective
- ★★★ There is uncertain evidence that the intervention is very cost-effective or reliable evidence that the intervention is cost-effective
- ★★ There is uncertain evidence that the intervention is cost-effective
- ★ There is insufficient or contradictory evidence

Not rated: No economic evidence was identified

Drug use

Amongst the programmes and interventions that prevent the uptake or harm from drug use, those that were directed at children had most evidence regarding effectiveness and cost-effectiveness. There was reliable evidence of a large effect of school based programmes that aimed to prevent uptake of drugs in school and for methadone and some other substitution programmes. Economic evidence was identified that demonstrates that a life skills programme that aimed to reduce cocaine consumption produced public sector savings that exceed the cost of the intervention.

There was insufficient data to conclude on the cost-effectiveness of the other interventions in this category.

Sexual health

For interventions that aim to improve sexual health, some evaluations used condom use as a behavioural outcome which could be applied across the two areas of interest, prevention of infections and prevention of teenage pregnancy.

There was evidence that individual risk counselling and screening and testing were both effective and cost-effective. Population screening programmes for STI (chlamydia and gonorrhoea) when combined with effective treatments were highly effective at reducing pelvic inflammatory disease and produced public sector cost savings that exceeded the costs of the programme. Screening for HIV coupled with effective management produces a lifetime gain in quality of life that justified its cost.

The review identified limited evidence of the cost effectiveness of school-based programmes to increase increases in condom use. However some universal programmes (school based campaigns and mass media campaigns) had other objectives and overall we found insufficient evidence of general effectiveness to score these.

Breastfeeding

The review identified relatively good evidence for the effectiveness of antenatal or postnatal education to either promote initiation of breast feeding or to lengthen the duration of breastfeeding for the women who had started. Though the cost of these interventions could be low, there was insufficient evidence to determine whether they were cost effective.

Nutrition

Economic evidence was available for specific examples of only one of the interventions to promote healthy nutrition – nutrition counselling in primary care. However, this evidence was insufficient to conclude whether the intervention was cost-effective.

There are a variety of interventions that can broadly be described as intensive interventions for promoting lifestyle change. Systematic reviews of these did show large improvements in some parameters of a healthy diet. Some large effects were shown within this intervention type,

particularly those directed at preventing diabetes in people with impaired glucose tolerance by a high intensity dietary advice, educational and physical activity intervention delivered together.

More general nutritional counselling in primary care has evidence for general effectiveness. Other interventions in this category also overlap with obesity interventions and also some aspects of improving health in the elderly. Combining the appropriate components of general nutritional counselling across settings (school or primary care clinic) and including a wider range of health outcomes (cancer, cardiovascular disease, diabetes) may change the assessment of effectiveness and alter cost effectiveness in favour of these activities.

Health of the elderly

When assessing the priority for interventions that aim to improve health in the elderly, the effectiveness and cost effectiveness scores align – implying that vaccination for influenza and fall prevention programmes are both moderately effective and good value for money (both reducing future public sector costs and increasing health related quality of life). The specific interventions that are useful in preventing falls invite closer inspection, as strategies may target either one or multiple risk factors, and may be targeted at the individual or begin at specific ages.

Table 5 Summary of effectiveness evidence

Note: Because of the different estimates of effect used by studies within different intervention categories, comparison across effectiveness ratings are only valid within intervention categories.

Ref	Specific description of intervention	Universal or High risk/targeted approach	Effect size	Outcome directness (external validity)	Reliability/quality of the body of evidence (internal validity, volume, consistency)	Rating
1	Smoking cessation					
1a(i)	Mass media campaigns for adults	Universal	Moderate	Direct	Reliable	★★★
1a(ii)	Mass media campaigns for children	Universal	Low	Direct	Uncertain	
1b	Education in schools	Universal	Low	Direct	Uncertain	
1c	Phone counselling quitlines	Universal	Moderate	Direct	Reliable	★★★
1d	Brief interventions in primary care	Targeted/high risk	Moderate	Direct	Reliable	★★★
1e	Pharmacotherapy	Targeted/high risk	Moderate	Direct	Reliable	★★★★
2	Obesity prevention					
2a	Mass media campaigns	Universal	Low	Direct	Reliable	★★
2b	Education in schools	Universal	Moderate	Indirect	Reliable	★★
2c	Screening for obesity	Universal	Insufficient	Indirect	Uncertain	
2d	Community based interventions to increase physical activity	Universal	Moderate	Indirect	Reliable	★★
2e	Multifactorial targeted interventions	Targeted/high risk	Moderate	Direct	Reliable	★★★
3	Preventing dangerous drinking					
3a	Mass media campaigns	Universal	Moderate	Direct	Uncertain	★★
3b	Brief interventions in primary care for high risk drinkers	Targeted/high risk	Moderate	Direct	Reliable	★★★
3c	Pharmacotherapy and psychotherapy for alcohol dependence	Targeted/high risk	High	Direct	Reliable	★★★★
3d(i)	Education in schools – classroom based	Universal	High	Direct	Reliable	★★★★
3d(ii)	Education in schools – one on one	Targeted/high risk	Moderate	Direct	Uncertain	★★
3e	Intensive motivational counselling	Targeted/high risk	Insufficient	Indirect	Uncertain	
4	Preventing illicit drug use					
4a	Education in schools	Universal	High	Direct	Reliable	★★★★
4b	Needle and syringe exchange schemes	Targeted/high risk	High	Indirect	Reliable	★★★
4c	Methadone and other substitution programmes	Targeted/high risk	High	Direct	Reliable	★★★★
4d	Screening and identification of drug users	Universal	Insufficient	Indirect	Uncertain	
4e	Support for vulnerable children and young people	Universal	Moderate	Direct	Reliable	★★★
5	Reducing STIs and teenage conception					
5a	Partner notification for sexually transmitted infections	Targeted/high risk	Low	Direct	Reliable	★★
5b	Individual risk counselling	Targeted/high risk	Moderate	Direct	Reliable	★★★
5c	Education in schools	Universal	Low	Indirect	Uncertain	
5d	Mass media campaigns	Universal	Low	Indirect	Uncertain	
5e	Screening for sexually transmitted infections	Universal	High	Direct	Reliable	★★★★

Ref	Specific description of intervention	Universal or High risk/targeted approach	Effect size	Outcome directness (external validity)	Reliability/quality of the body of evidence (internal validity, volume, consistency)	Rating
6	Promoting breastfeeding					
6a	Mass media campaign	Universal	Insufficient	Direct	Uncertain	
6b	Antenatal education for increasing initiation of breastfeeding	Universal	High	Direct	Reliable	★★★★
6c	Postnatal support for increasing duration of breastfeeding	Universal	Moderate	Direct	Reliable	★★★
7	Promoting health nutrition					
7a	Nutritional counselling in GP or nurse clinics	Universal	Low	Direct	Reliable	★★
7b	Intensive interventions for promoting lifestyle change	Targeted/high risk	High	Direct	Reliable	★★★★
7c	School nutrition schemes	Universal	Moderate	Direct	Reliable	★★★
7d	Media campaigns	Universal	Low	Indirect	Uncertain	
7e	Nutrition labelling schemes	Universal	Low	Indirect	Uncertain	
8	Health of the elderly					
8a	Vaccination for influenza	Universal	Moderate	Direct	Reliable	★★★
8b	Vitamin D and calcium for bone health	Universal	Low	Direct	Reliable	★★
8c	Osteoporosis screening	Universal	Insufficient	Indirect	Reliable	
8d	Community based vision screening	Universal	None	Direct	Reliable	
8e	Fall prevention	Universal	Moderate	Direct	Reliable	★★★

Key to ratings (effectiveness):

- ★★★★ There is reliable evidence of a large effect
- ★★★ There is uncertain evidence of a large effect or reliable evidence of a moderate effect
- ★★ There is uncertain evidence of a moderate effect or reliable evidence of a small effect
- ★ There is uncertain evidence of a small effect

Not rated: There is insufficient or no evidence

Table 6 Summary of economic evidence (benefits defined as public sector cost savings)

Ref	Specific description of intervention	Population or High risk/targeted approach	Cost-effective	Relevance to UK	Reliability	Rating
1	Smoking cessation					
1a	Mass Media Campaigns (adults)	Universal	Don't know	Relevant	Reliable	★
1b	School based programs to prevent uptake and encourage cessation	Universal	Don't know	Uncertain	Uncertain	★
1c	Phone counselling quitlines	Universal	Don't know	Uncertain	Reliable	★
1d	Nurse led	Targeted/high risk	Don't know	Uncertain	Uncertain	★
1e	Drug therapies for smoking cessation in adults	Targeted/high risk	Don't know	Relevant	Reliable	★
2	Obesity prevention					
2a	Mass Media campaigns (fighting fit fighting fat)	Universal				
2b	School education (assess and advise programmes)	Universal	Uncertain	Uncertain	Reliable	★
2c	Screening for obesity in adults	Universal				
2d	Community based interventions to increase PA	Universal	Don't know	Uncertain	Reliable	★
2e	Multifactor targeted interventions for people identified as obese	Targeted/high risk	Don't know	Uncertain	Reliable	★
3	Preventing dangerous drinking					
3a	Mass media and awareness campaigns	Universal				
3b	Brief interventions in primary care with high risk drinkers	Targeted/high risk	Very CE	Uncertain	Reliable	★★★
3c	Drugs and psychotherapy for alcohol dependence	Targeted/high risk				
3d	School based interventions to address alcohol	Both	Don't know	Uncertain	Uncertain	★
3e	Intensive motivational interviewing and other counselling programmes	Targeted/high risk				
4	Preventing illicit drug use					
4a	School based interventions	Universal	Very CE	Uncertain	Reliable	★★★
4b	Needle exchange schemes, supervision	Targeted/high risk				
4c	Methadone and other substitution programmes	Targeted/high risk				
4d	Screening/identification of users	Universal				
4e	Community based interventions for vulnerable children and young people	Universal	Don't know	Uncertain	Reliable	★
5	Reducing STIs and teenage conception					
5a	Partner notification schemes for STI	Targeted/high risk	Don't know	Uncertain	Uncertain	★
5b	Individual risk counselling	Targeted/high risk	Don't know	Relevant	Uncertain	★
5c	School education programmes	Universal	CE	Uncertain	Reliable	★★
5d	Mass media campaigns	Universal	Don't know	Uncertain	Uncertain	★
5e (i)	Screening for STI (chlamydia, HIV) - screening	Universal	Uncertain	Uncertain	Reliable	★
5e (ii)	Screening for STI (chlamydia, HIV) – screening + treating	Universal	Very CE	Uncertain	Reliable	★★★
6	Promoting breastfeeding					
6a	Mass Media campaigns to promote breast feeding	Universal				
6b	Antenatal education to promote initiation of breast feeding	Universal				
6c	Postnatal care for lengthening duration of breast feeding	Universal	Don't know	Uncertain	Reliable	★
7	Promoting healthy nutrition					
7a	Nutritional counselling in GP or nurse clinics	Universal	Don't know	Uncertain	Reliable	★
7b	Intensive interventions for promoting lifestyle change	Targeted/high risk				

Ref	Specific description of intervention	Population or High risk/targeted approach	Cost-effective	Relevance to UK	Reliability	Rating
7c	School nutrition schemes	Universal				
7d	Media campaigns 5 a day	Universal				
7e	Nutrition labelling schemes	Universal				
8	Health of the elderly					
8a	Vaccination	Universal	Very CE	Uncertain	Reliable	★★★
8b	Vitamin D (with or without calcium) for bone health	Universal	Don't know	Relevant	Uncertain	★
8c	Screening for osteoporosis	Universal				
8d	Vision screening	Universal				
8e	Fall prevention programmes	Universal	Very CE	Uncertain	Reliable	★★★

Key to ratings (economics):

- ★★★★ There is reliable evidence that the intervention is very cost-effective
- ★★★ There is uncertain evidence that the intervention is very cost-effective or reliable evidence that the intervention is cost-effective
- ★★ There is uncertain evidence that the intervention is cost-effective
- ★ There is insufficient or contradictory evidence

Not rated: No economic evidence was identified

Table 7 Summary of economic evidence (benefits defined as health related quality of life gains)

Ref	Specific description of intervention	Population or High risk/targeted approach	Cost-effective	Relevance to UK	Reliability	Rating
1	Smoking cessation					
1a	Mass Media Campaigns (adults)	Universal	Don't know	Relevant	Reliable	★
1b	School based programs to prevent uptake and encourage cessation	Universal	CE	Uncertain	Uncertain	★★
1c	Phone counselling quitlines	Universal	Don't know	Uncertain	Reliable	★
1d	Nurse led	Targeted/high risk	Don't know	Uncertain	Uncertain	★
1e	Drug therapies for smoking cessation in adults	Targeted/high risk	Very CE	Relevant	Reliable	★★★★
2	Obesity prevention					
2a	Mass Media campaigns (fighting fit fighting fat)	Universal				
2b	School education (assess and advise programmes)	Universal	Very CE	Uncertain	Reliable	★★★
2c	Screening for obesity in adults	Universal				
2d	Community based interventions to increase PA	Universal	Don't know	Uncertain	Reliable	★
2e	Multifactor targeted interventions for people identified as obese	Targeted/high risk	Don't know	Uncertain	Reliable	★
3	Preventing dangerous drinking					
3a	Mass media and awareness campaigns	Universal				
3b	Brief interventions in primary care with high risk drinkers	Targeted/high risk	Don't know	Uncertain	Reliable	★
3c	Drugs and psychotherapy for alcohol dependence	Targeted/high risk				
3d	School based interventions to address alcohol	Both	Don't know	Uncertain	Uncertain	★
3e	Intensive motivational interviewing and other counselling programmes	Targeted/high risk				
4	Preventing illicit drug use					
4a	School based interventions	Universal	Don't know	Uncertain	Reliable	★
4b	Needle exchange schemes, supervision	Targeted/high risk				
4c	Methadone and other substitution programmes	Targeted/high risk				
4d	Screening/identification of users	Universal				
4e	Community based interventions for vulnerable children and young people	Universal	Don't know	Uncertain	Reliable	★
5	Reducing STIs and teenage conception					
5a	Partner notification schemes for STI	Targeted/high risk	Don't know	Uncertain	Uncertain	★
5b	Individual risk counselling	Targeted/high risk	Very CE	Relevant	Uncertain	★★★
5c	School education programmes	Universal	Don't know	Uncertain	Reliable	★
5d	Mass media campaigns	Universal	Don't know	Uncertain	Uncertain	★
5e (i)	Screening for STI (chlamydia, HIV) - screening	Universal	CE	Uncertain	Reliable	★★
5e (ii)	Screening for STI (chlamydia, HIV) – screening + treating	Universal	Don't know	Uncertain	Reliable	★
6	Promoting breastfeeding					
6a	Mass Media campaigns to promote breast feeding	Universal				
6b	Antenatal education to promote initiation of breast feeding	Universal				
6c	Postnatal care for lengthening duration of breast feeding	Universal	Don't know	Uncertain	Reliable	★
7	Promoting healthy nutrition					
7a	Nutritional counselling in GP or nurse clinics	Universal	Don't know	Uncertain	Reliable	★
7b	Intensive interventions for promoting lifestyle change	Targeted/high risk				

Ref	Specific description of intervention	Population or High risk/targeted approach	Cost-effective	Relevance to UK	Reliability	Rating
7c	School nutrition schemes	Universal				
7d	Media campaigns 5 a day	Universal				
7e	Nutrition labelling schemes	Universal				
8	Health of the elderly					
8a	Vaccination	Universal	Very CE	Uncertain	Reliable	★★★
8b	Vitamin D (with or without calcium) for bone health	Universal	Don't know	Relevant	Uncertain	★
8c	Screening for osteoporosis	Universal				
8d	Vision screening	Universal				
8e	Fall prevention programmes	Universal	Don't know	Uncertain	Reliable	★

Key to ratings (economics):

- ★★★★ There is reliable evidence that the intervention is very cost-effective
- ★★★ There is uncertain evidence that the intervention is very cost-effective or reliable evidence that the intervention is cost-effective
- ★★ There is uncertain evidence that the intervention is cost-effective
- ★ There is insufficient or contradictory evidence

Not rated: No economic evidence was identified

5.0 Detailed findings

This section provides more detail on the evidence identified for each of the public health interventions. Effectiveness studies are more prevalent than cost-effectiveness studies, and cost-effectiveness analysis tends to be undertaken on those interventions which have already been demonstrated to be effective. Consequently, the evidence for each intervention is presented in the following format:

1. A summary of the evidence of effectiveness: A description of the broad set of interventions for which effectiveness analysis has been undertaken has been identified and a summary of that evidence.
2. A summary of the evidence of cost-effectiveness: A description of the specific interventions for which cost-effectiveness analysis has been undertaken, and a summary of the cost of these interventions, the effectiveness of these interventions, the health gains and public sector cost savings associated with these effects, and combining all these data a summary of whether the intervention can be considered cost-effective.

Details are provided on the effectiveness evidence emerging from both sets of literature, so that any discrepancies can be identified. For instance it might be the case that cost-effectiveness analysis yields a favourable result for a particular variant of an intervention in a specific population subset, but the effectiveness evidence demonstrates that the intervention type is not effective in broader circumstances or populations.

5.1 Reducing smoking and the harms from smoking

5.1.1 Mass media campaigns (1a)

Effectiveness evidence (mass media aimed at adults)

Intervention

Mass media supported cessation campaigns designed to encourage adults to quit smoking, including communication by television, radio, newspapers, billboards, posters, leaflets, or booklets that are intended to reach large numbers of people. These campaigns are not dependent on person-to-person contact, and may be used either on their own or in conjunction with wider tobacco control programs. This intervention does not include “quit and win” or other incentive or competition based programs.

Effect

- Overall, there is evidence of a moderate effect of multi-channel mass media campaigns when delivered as part of a comprehensive tobacco control program.

Mass media campaigns are inherently difficult to evaluate, since large samples are required to detect relatively small effects on individual members of the target community. They are also

often delivered in the context of other interventions. These conclusions are based on two systematic reviews of other reviews, RCTs, quasi experimental studies, and observational studies (NICE, 2008; Bala et al, 2008).

Effectiveness evidence (mass media aimed at children and young people)

Intervention

Media supported campaigns to prevent uptake of smoking in young people, including communication by television, radio, newspapers, billboards, posters, leaflets, or booklets that are intended to reach large numbers of people.

Effect

- Overall, there is limited evidence of a low effect of mass media campaigns to reduce smoking in young people.

Mass media campaigns are inherently difficult to evaluate, since large samples are required to detect relatively small effects on individual members of the target community. They are also often delivered in the context of other interventions. These conclusions are based on a systematic review of RCTs, non-randomised controlled trials and time series studies (Sowden and Arblaster, 2008).

Economic evidence

The review identified 1 study from the UK (Stevens et al, 2002), 3 studies from the USA (Danaher et al, 1984; Secker-Walker et al, 1997; and Pechmann et al, 2000) and 1 study from the Netherlands (Mudde et al, 1999) that assessed the cost-effectiveness of mass media campaigns to promote smoking cessation.

Intervention cost

There is strong evidence that mass media campaigns for both young and adult populations cost between £0.26 and £1.78 per capita. Estimates of cost are higher than the unit receiving the intervention is defined as those potentially exposed to the campaign (£18 - £34).

Effect

There is good evidence to suggest that mass media campaigns reduce smoking prevalence in both adult and young populations.

Health gain

Good evidence from the UK suggests that a multi-faceted media campaign targeted at Turkish speaking smokers results in 0.136 life years gained.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

The evidence suggests that mass media campaigns reduce smoking prevalence. However, the analysis is unable to say whether this reduction in smoking prevalence is worth the extra cost of the campaigns.

5.1.2 School education to prevent uptake and encourage cessation (1b)

Effectiveness evidence

Intervention

Interventions for young people that either aim to prevent uptake or to encourage cessation using school as a base. A wide variety of interventions fall under this heading, including programmes in class, information, social influence approaches, and generic social competence approaches.

Effect

- Overall there is evidence of low effectiveness of school based interventions to prevent smoking or encourage cessation in young people.

Guidance from NICE on 'preventing the uptake of smoking by children' is due to be issued in July 2008. From current reviews, evidence suggests that school based interventions have little effect, particularly in the long term. These conclusions are based on two systematic reviews of RCTs and non-randomised controlled trials (Thomas and Perera, 2008; Grimshaw and Stanton, 2006).

Economic evidence

The review identified 1 study from the USA (Tengs et al, 2001) that assessed the cost-effectiveness of school education to prevent smoking cessation.

Intervention cost

There is strong economic evidence to suggest that, when compared with an average nationwide educational practice, an enhanced nationwide school programme aimed at preventing smoking initiation among young adolescents would cost £72 per person. However, this estimate is taken from USA and caution should be taken when transferring this estimate to the UK.

Effect

No effect data is reported.

Health gain

Strong evidence suggests that the health related quality of life gain associated with an enhanced nationwide school programme aimed at preventing smoking initiation was 0.0049 QALYs (£98) over the 50 years after the intervention.

Future cost savings

Not future cost savings were reported.

Cost-effectiveness

The monetary value of the health related quality of life gains associated with school education for smoking cessation exceed its costs.

5.1.3 Phone counselling quit lines (1c)**Effectiveness evidence****Intervention**

Proactive or reactive telephone counselling for smoking cessation in any population. Quitline can be offered in combination with other strategies, e.g. alongside face-to-face support, self-help interventions or pharmacotherapy. Telephone counselling interventions can include providing access to a helpline, following up people who call a quitline with more calls, or proactively enrolling people in telephone counselling programs.

Effect

- Overall, there is evidence of a moderate effect of proactive telephone counselling and that call-back counselling to people who call quitlines can improve quit rates.

There is evidence that among smokers who call quitlines, quit rates are improved if they receive multiple sessions of call-back counselling (NICE, 2008; Stead et al, 2006). Proactive telephone counselling (not initiated by calls to a helpline) also improves quit rates (Stead et al, 2006). There is evidence that providing access to a quit line has a low effect on smoking outcomes (conflicting results from two studies) (Stead et al, 2006). These conclusions are based on two systematic reviews (NICE, 2008; Stead et al, 2006).

Economic evidence

The review identified 1 study from the USA (McAlister et al, 2004) that assessed the cost-effectiveness of phone counselling.

Intervention cost

There is good economic evidence to suggest that the cost of phone counselling is £46 per person. However, caution should be taken when transferring this estimate to the UK, as the evidence was collected in the USA.

Effect

There is strong evidence that phone counselling increases quit rates by 78%.

Health gain

No health gains were reported.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

The evidence suggests that phone counselling increases quit rates. However, the analysis is unable to say whether this improvement in quit rates is worth the extra cost of the counselling.

5.1.4 Nurse led cessation clinics (1d)

Effectiveness evidence

Intervention

Provision of brief advice, discussion, encouragement or negotiation delivered by a range of primary and community professionals. Interventions typically take 5 to 10 minutes and could include cessation advice, assessment of commitment to quit, offer of further therapy (behavioural or pharmacotherapy), provision of information/self-help material or onwards referral to NHS Stop Smoking Services.

Effect

- There is evidence that brief interventions delivered by physicians during routine care and focussed advice given by nurses have a moderate effect in increasing smoking cessation.

Brief opportunistic advice from a physician in the context of routine care increases quit rates (NICE, 2008; NICE, 2006a; Academic and Public Health Consortium, 2005). There is insufficient evidence about nurse-led advice outside of a hospital setting, but focussed brief advice by nurses (i.e. set up specifically to deliver smoking cessation advice) has a high effect on quit rates (NICE, 2006a; Academic and Public Health Consortium, 2005). There is insufficient evidence about the effects of brief counselling by pharmacists or dentists, or physicians in accident and emergency departments (NICE, 2006a; Academic and Public Health Consortium, 2005). There is not enough evidence to determine which components of a provider-delivered intervention are successful (NICE, 2006a; Academic and Public Health Consortium, 2005). These conclusions are based on a systematic review of reviews and a systematic review of RCTs (NICE, 2008; Rice & Stead, 2008; NICE, 2006a; Academic and Public Health Consortium, 2005).

Economic evidence

The review identified 1 study from the USA (Krumholz et al, 2006) that assessed the cost-effectiveness of nurse led smoking cessation.

Intervention cost

There is good economic evidence to suggest that, when compared with usual care, a nurse managed smoking cessation intervention targeted at patients hospitalised after a myocardial infarction costs £83 per person. However, caution should be taken when transferring this estimate to the UK, as the evidence was collected in the USA.

Effect

Limited evidence suggests that, when compared with usual care, a nurse managed smoking cessation intervention for patients hospitalised after a myocardial infarction increases the chances of quitting by 26.3% over a period of 12 months.

Health gain

The evidence indicates that the health gains associated with a nurse managed smoking cessation intervention for patients hospitalised after a myocardial infarction are equivalent to 0.455 life years gained.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

The evidence suggests that nurse led smoking cessation may increase quit rates. However, the analysis is unable to say whether this improvement in quit rates is worth the extra cost of the nurse intervention.

5.1.5 Drug therapies for smoking cessation (1e)

Effectiveness evidence**Intervention**

Drugs used to encourage smoking cessation. This can include nicotine replacement therapy (such as nicotine patches and gum), nicotine receptor partial agonists (such as varenicline), opioid antagonists (such as naltrexone), clonidine, lobeline, or antidepressants (such as bupropion).

Effect

- There is evidence that drugs therapy (bupropion, nicotine replacement therapy, and varenicline) has a moderate effect on smoking cessation, particularly in people motivated to quit.

Drug therapy is an effective intervention to encourage smoking cessation. The most effective treatments and those recommended by NICE following substantial literature review are nicotine replacement therapy (all forms, particularly in people motivated to quit), bupropion and varenicline (NICE, 2008; Wang D et al, 2008; Stead et al, 2008; Hughes et al, 2007; NICE, 2007e). Nicotine replacement therapies can achieve sustained smoking abstinence for smokers who are unwilling or unable to attempt an abrupt quit (Wang D et al, 2008). There is conflicting evidence of the effects of other drugs, e.g. rimonabant (a cannabinoid type 1 receptor antagonist) (Cahill & Ussher, 2007), naltrexone (David et al, 2006), clonidine (Gourlay et al, 2004). These conclusions are based on nine systematic reviews (NICE, 2008; Wang D et al,

2008; Hughes et al, 2007; Cahill & Ussher, 2007; Cahill et al, 2007; NICE, 2007e; David et al, 2006; Gourlay et al, 2004; Stead & Hughes, 1997).

Economic evidence

The review identified 4 studies from the UK (Akehurst et al, 1994; Parott et al, 1998; Stapleton et al, 1999; and Song et al, 2002), 6 studies from the USA (Fiscella et al, 1996; Cromwell et al, 1997; Wasley et al, 1997; Alterman et al, 2001; Schauffle et al, 2001; and Oster et al, 2006), and 1 study from Australia (Buck et al, 2006) that assessed the cost-effectiveness of drug therapies for smoking cessation.

Intervention cost

There is strong economic evidence from the UK on the cost of NRT (£41-£142 per person), bupropion (£78 - £83 per person), and combinations of NRT and bupropion (£156 - £161 per person).

Effect

A mixture of research designs estimate the quit rate associated with drug therapies for smoking cessation in the UK. NRT prescription alone was associated with a quit rate of between 57% and 216%. Bupropion alone was associated with a quit rate of between 89% and 101%. A combination of bupropion and NRT was associated with a quit rate of between 127% and 149%.

Health gain

There is strong evidence of the monetary value of the health related quality of life gains associated with drug therapies for smoking cessation. NRT alone was associated with a gain of £820-£1,840 per person. Bupropion alone was associated with a gain of £1,320-£2,900 per person. A combination of NRT and bupropion was associated with a gain of £1,920-£4,140 per person.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

There is strong evidence to suggest that the monetary value of the health gain associated with NRT and bupropion significantly exceeds their cost.

5.2 Preventing obesity and reducing the complications of obesity

5.2.1 Mass media campaigns (2a)

Effectiveness evidence

Intervention

Mass media campaigns aim to raise awareness through television, radio, internet and press coverage, and promote healthy eating and physical activity that will lead to weight loss. One such campaign was the UK multi-component mass media intervention, Fighting Fat, Fighting Fit – which raised public awareness through peak-time BBC TV and radio broadcasts, with Ceefax, website, national and regional press coverage (Wardle et al, 2001). The campaign lasted for 7 weeks and people were asked to register via mail or telephone for a registration pack including lifestyle change information and surveys of weight loss, physical activity and diet to return over a 5 month period.

Effect

- Mass media campaigns have a low effect in promoting weight loss and improved healthy eating.

There is limited evidence to show that multi-component media campaigns such as Fighting Fit, Fighting Fat can have an effect on weight loss and healthy eating. The Fighting Fit Fighting Fat campaign was found to be most effective in improving eating behaviour of adults of higher social status. There is limited evidence for effects upon physical activity, on people of lower socioeconomic groups, or amongst young people. These conclusions are based on a systematic review, which identified only one study, a survey looking at the effects of the Fighting Fat, Fighting Fit campaign (NICE, 2006c; Wardle et al, 2001).

Economic evidence

No economic evidence identified.

5.2.2 School education (2b)

Effectiveness evidence

Intervention

School based programmes address diet and physical activity through appropriate modifications to the curriculum and school environment. In the UK, school buildings should meet the National Schools Programme and have recreational facilities, catering facilities, physical education curriculum, provision for cycling and school travel, and after-school activities. Other aspects of the multicomponent interventions include training teaching, support and catering staff in healthy school policies and their implementation, and informing parents through news letter and information about healthy school initiatives.

Effect

- There is evidence that school based multi-component interventions promoting healthy food and activity have a moderate effect in improving diet or activity levels amongst children.

There is a large quantity of evidence to support multi-component interventions in schools that address diet, physical activity and make appropriate modifications to the school building in terms of improving diet and physical activity amongst children. There is equivocal evidence about whether these interventions have any effect upon weight related outcomes. These conclusions are based on a systematic review of RCTs and non-randomised controlled trials (NICE, 2006c; Centre for Reviews and Dissemination, 2002). Most of the evidence is from primary schools and is non-UK based.

Economic evidence

The review identified 1 study from the USA (Wang et al, 2003) that assessed the cost-effectiveness of school education for the prevention of obesity.

Intervention cost

There is strong economic evidence to suggest that delivering an interdisciplinary curriculum to reduce obesity among middle-school age children costs £23 per person more than delivering the usual curriculum and physical education classes. However, the evidence is collected in the USA, and caution should be taken when transferring these estimates to the UK.

Effect

Good quality evidence suggests that an interdisciplinary curriculum is more effective than usual curriculum and physical education classes. After 24 months, the prevalence of obesity among girls had decreased by 23% points. Though no effect was observed among male students.

Health gain

Good quality evidence suggests that by reducing obesity among middle-school age children the interdisciplinary curriculum results in health related quality of life gains of 0.0034 QALYs. Using the lower bound of the NICE shadow prices for a QALY of £20,000, the QALYs gained can be valued at £68 per person.

Future cost savings

Good quality evidence suggests that by reducing obesity among middle-school age children the interdisciplinary curriculum results in £11 of health cost savings per person over a period of 24 months. However, the evidence is collected in the USA, and caution should be taken when transferring these estimates to the UK.

Cost-effectiveness

The evidence suggests that the health related quality of life gains and public sector costs saved exceed the cost of the interdisciplinary curriculum.

5.2.3 Screening for obesity in adults (2c)

Effectiveness evidence

Intervention

Routine body mass index (BMI) screening to identify those who would benefit from weight loss for targeted interventions including counselling, support and behavioural interventions.

Effect

- No estimate of effect of screening for obesity possible because of insufficient evidence

There is no direct evidence regarding the effects on health outcomes of screening of the general population for obesity. There is insufficient evidence to currently recommend BMI screening in children as it is not considered a reliable indicator of risk of adult obesity and may cause harm from labelling a child as overweight or obese. There is evidence that interventions can promote weight loss in people who are overweight or obese, and that weight reduction is associated with improved health outcomes. These conclusions are based on three systematic reviews, which identified no trials assessing the effects of routine obesity screening on clinical outcomes (NICE, 2006c; Whitlock et al, 2005; McTigue et al, 2003).

Economic evidence

No economic evidence identified

5.2.4 Community based interventions to increase physical activity (2d)

Effectiveness evidence

Intervention

Community based interventions to increase physical activity are often delivered in primary care, and can range from basic advice, discussion and encouragement, to individual focused attempts to change lifestyle factors and increase activity. A written prescription alongside verbal advice is recommended. Delivery may be by a range of health professionals and may include care outside of the general practice setting, e.g. a leisure centre. Other approaches include use of pedometers to increase activity levels through walking, organised walks and bike rides, exercise referral schemes (services offering tailored physical activity, monitoring and follow-up).

Effect

- Brief interventions in primary care have a moderate effect in increasing physical activity levels in the middle aged and elderly.

There is evidence that brief interventions in primary care (including interventions in other locations, e.g. community centres) involving targeted verbal and written advice, discussion and encouragement with regular follow up by a range of health professionals are effective in increasing activity levels. Most evidence is limited to the middle aged and elderly. There is insufficient evidence to recommend exercise referral schemes, pedometers, or walking or cycling schemes. These results were based on a systematic review of RCTs and non randomised controlled trials (NICE, 2006b).

Economic evidence

The review identified 4 studies from Australia (Dzator et al, 2004), New Zealand (Elley et al, 2003) and the USA (Sevick et al, 2000; and Finkelstein et al, 2002) on the cost-effectiveness of community-based interventions to increase physical activity.

Intervention cost

The costs of the interventions identified vary from £65 per person for GP referrals to leisure centres or gyms to £917 per person for structured supervised exercise programmes over 24 months. Lifestyle interventions cost between £141 and £319 per person. However, the evidence is collected in Australia, New Zealand and the USA, and caution should be taken when transferring these estimates to the UK.

Effect

Strong evidence from RCT studies suggests that mail-out campaigns, structured exercise programmes and lifestyle interventions have positive effects at increasing physical activity or reducing weight over periods of 6 to 12 months. However, one study suggested that the effect of structured exercise programmes are not maintained over a 24 month follow up period.

Health gain

No health gains were reported.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

The evidence suggests that community based interventions, specifically mail outs, lifestyle interventions, are successful at increasing physical activity levels. However, the analysis is unable to say whether the improved physical activity level is worth the extra cost of community interventions.

5.2.5 Multifactor targeted interventions for people identified as obese (2e)

Effectiveness evidence

Intervention

Primary care identification and multifactorial clinical management including a weight management programme, deciding a target weight loss, discussing comorbidity and making personalised lifestyle changes to improve health behaviour, increase activity levels and improve diet to reduce energy intake. These interventions may be supported by counselling.

Effect

- Sustained multi-component interventions including diet, activity support and counselling delivered through primary or secondary care have a moderate effective in producing weight loss for people identified as obese or overweight.

Multicomponent interventions delivered through clinical care settings and including both diet and physical activity support with follow up, with or without behavioural counselling, are effective in producing weight loss in overweight or obese people. The combination of support is considered to be more effective than focusing on one component alone, e.g. diet or activity. Brief primary care interventions without sustained support have not been found to be effective.

Recommendation to commercial weight loss programmes such as Weight Watchers may be effective, but there is insufficient evidence regarding other non-clinical community interventions. These conclusions are based on a systematic review of RCTs and non-randomised controlled trials (NICE, 2006c).

Economic evidence

The review identified 2 studies from the USA (Goldfield et al, 2001; Diabetes Prevention Program Research Group, 2003) on the cost-effectiveness of multifactor targeted interventions for people identified as obese.

Intervention cost

There is strong economic evidence to suggest that:

- When compared with standard lifestyle recommendations, an intensive lifestyle intervention for obese adults cost an extra £1757 per person.
- Behavioural treatments for obese children cost £1105 when delivered both individually and in groups and £391 when just delivered in groups.

However, the evidence is collected from the USA, and caution should be taken when these estimates are transferred to the UK.

Effect

Strong evidence indicates that behavioural treatments targeted at obese children reduce body mass index by 0.49 - 0.56 units over a period of 12 months depending on whether the intervention is delivered individually or in groups.

Health gain

Limited evidence suggests that, compared with standard lifestyle recommendations, an intensive lifestyle intervention is effective at reducing the prevalence of type 2 diabetes by 58% over a period of 36 months, and increases health related quality of life 0.072 QALYs per participant. Using the lower bound of the NICE shadow prices for a QALY of £20,000, the QALYs gained can be valued at £1,400 per person.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

The evidence suggests that:

- Individual and group behavioural treatment reduces BMI. However, the analysis cannot conclude whether the reduction in BMI is worth the extra cost of the behavioural treatment.
- Intensive lifestyle interventions costing £1,757 per participant produce increases in health related quality of life of £1,400 per participant. However, it is not possible to conclude that intensive lifestyle interventions are not cost-effective, as the increase in health related quality of life is only measured over a period of three years.

5.3 Preventing dangerous drinking

5.3.1 Mass media awareness campaigns (3a)

Effectiveness evidence

Intervention

Mass media campaigns broadly try to persuade individuals to either take personal steps to avoid drinking and driving or those that try to prevent others from drinking and driving. Campaigns usually focus on causal factors and aim messages at either general or youth audiences. Often reinforced by other efforts, such as law enforcement and specific interventions at alcohol outlets. Methods used include advertising via public service announcements, more targeted social marketing campaigns and the use of warning labels on alcoholic drinks. Additional goals may include responsible drinking and education on standard drink size.

Effect

- Mass Media campaigns when linked to personal prevention activities and other legislative interventions have a moderate effect in reducing the number of alcohol related crashes.

The nature of this intervention makes it difficult to objectively assess the features that determine success or to have confidence in any estimate of success these campaigns might have in countries of cultures that are different to those in the primary trials. Success in changing behaviour appears to be related to the message content (appeal to themes that motivate, such as fear of arrest, fear of harm to oneself or others) and message delivery (production quality and optimum timing and placement). Mass media health promotion campaigns that are carefully planned, well executed, attain adequate audience exposure, and are implemented in conjunction with other ongoing prevention activities, such as enhanced law enforcement, are effective in reducing alcohol impaired driving and alcohol related crashes. These conclusions are based on a systematic review of observational studies (Elder et al, 2004).

Economic evidence

No economic evidence identified

5.3.2 Brief interventions in primary care with high risk drinkers (3b)

Effectiveness evidence

Intervention

Routine identification of hazardous drinking using questions about alcohol consumption during registration, general health checks and as part of opportunistic health screening. Subsequent brief interventions are based on theoretical models of behaviour change. Based in primary care, these may include feedback, clarification, provision of information, motivational enhancement and development of personal plans. The intervention is of low intensity, typically running over one to four sessions and can be provided by a range of healthcare workers such as general practitioners, nurses or psychologists. The usual definition of brief suggests that the intervention occurs within the time-frame of a standard consultation, 5 to 15 minutes for a general physician, longer for a nurse.

Effect

- There is evidence that brief intervention to identify and counsel men with problematic drinking habits in primary care have a moderate effect in reducing the amount of alcohol drunk.

Overall, brief interventions do lower alcohol consumption. The effect was clear in men at one year of follow up, but not in women. Longer duration of counselling probably has little additional effect. These conclusions are based on a systematic review of RCTs (Kaner et al, 2007).

Economic evidence

The review identified 1 study from Australia (Wutxe et al, 2001) and 2 studies from the USA (Pentz, 1998; and Flemming et al, 2001) that assessed the cost-effectiveness of brief alcohol interventions in primary care.

Intervention cost

There is strong evidence to suggest that the cost of brief alcohol interventions in primary care cost between £12 and £153 per person. However, the evidence is collected in Australia and the USA, and caution should be taken when transferring these estimates to the UK.

Effect

A variety of research designs suggest that brief alcohol interventions reduce alcohol use and deaths attributable to alcohol. A high quality RCT suggests that brief interventions reduce alcohol use by 15%.

Health gain

Lifetime models suggest that brief interventions for alcohol use produce life year gains of 0.026-0.042 years.

Future cost savings

There is strong evidence that brief interventions result in avoided public sector costs of £650 over a period of 4 years post-intervention. However, the evidence is collected in the USA, and caution should be taken when transferring these estimates to the UK.

Cost-effectiveness

There is strong evidence to suggest that the public sector costs avoided due to brief interventions exceed the cost of the interventions themselves.

5.3.3 Drugs and psychotherapy for alcohol dependence (3c)

Effectiveness evidence**Intervention**

This intervention consists of a range of drug or psychological treatments used as secondary preventive activities usually initiated in specialist settings. These are aimed at dependent drinkers for reducing alcohol intake but also aim to preventing relapse and other health and social harms from dependent drinking. Drug therapies include naltrexone, opioid antagonists and supervised oral disulphiram.

Effect

- There is evidence that short-term naltrexone and psychological treatments have a high effect in reducing relapse rates in dependent drinkers

Short term naltrexone and short psychological treatments (Behavioural Self Control Training, Motivational Enhancement Therapy, Family Therapy, and Coping/Social Skills training) reduced relapse in dependent drinkers. Limited evidence suggests that supervised oral disulphiram can help to prevent relapse, but there was insufficient evidence about the effects of unsupervised disulphiram. Acamprosate increases abstinence rates. Nalmefene does not have a role in the treatment of alcohol dependence. These results are based on four systematic reviews of RCTs (Srisurapanont & Jarusuraisin, 2005; Pichon Riviere et al, 2003; Fox et al, 2003; SIGN, 2003; Slattery et al, 2002).

Economic evidence

No economic evidence identified.

5.3.4 School based interventions to address alcohol (3d)

Effectiveness evidence (classroom)

Intervention

Classroom based education programmes delivered by teachers that ensure alcohol education is part of curricula, tailored to different age groups, and aimed at encouraging children not to drink, or to delay the age at which young people start drinking and reduce the harm alcohol can cause among those who do drink.

Effect

- Classroom based education programmes delivered by teachers as part of the school curriculum have a high effect in reducing harmful drinking.

Classroom based curriculum interventions led by teachers were more applicable to the UK than individual one on one interventions and were not all based on an abstinence approach. They ranged in duration from programmes that delivered about 4 sessions over 4 weeks to some programmes that delivered up to 8 sessions each year for three years. Students typically began the programmes at about 13 years old. There is evidence from two classroom based, teacher-led programmes which targeted children between the ages of 12 and 13 years, to suggest that interventions using the life skills approach (Life Skills Training) or focusing on harm reduction through skills based activities (School Health and Alcohol Harm Reduction Project) can produce medium to long-term reductions in alcohol use and in particular, risky drinking behaviours such as drunkenness and binge drinking. These conclusions are based on a systematic review of systematic reviews, RCTs, non-randomised controlled trials and observational studies (NICE, 2007b; Foxcroft et al, 2002).

Effectiveness evidence (one-to-one)

Intervention

One on one interventions where educators, usually nurses, spend individual time with students thought to be drinking harmful amounts of alcohol. Those teaching on these programmes can tailor messages, ask questions and set appropriate plans for action. The intervention is more intensive and takes more time than brief interventions. In addition, programmes are often combined with family/parental education, curriculum interventions and interventions that target other substance use, for example drug use. Some One on one interventions are based on an abstinence approach.

Effect

- There is evidence that one on one school based interventions have a moderate short term effect in preventing or reducing alcohol use in young people.

Brief intervention programmes, which target children aged 12-13 and involve nurse-led consultations regarding a young person's alcohol use, such as the Start Taking Alcohol Risks Seriously for Families programme, can produce short term, but not medium term reductions in

heavy drinking. These conclusions are based on a systematic review of systematic reviews, RCTs, non-randomised controlled trials and observational studies (NICE, 2007b; Foxcroft et al, 2002).

Economic evidence

The review identified 1 study that assessed the cost-effectiveness of school-based interventions to address alcohol use in Australia and the USA (Jones et al, 2007).

Intervention cost

High quality economic evidence suggests that the cost of school-based alcohol interventions ranges from £21 per student (interventions delivered outside the classroom) to £155 per student (teaching of social competency and refusal skills). However, the evidence is collected in Australia and the USA, and caution should be taken when transferring these estimates to the UK

Effect

Poor quality research designs suggest that school-based interventions reduce both alcohol consumption (interventions delivered outside the classroom reduce alcohol consumption by 58%) and hazardous drink (teaching of social competency and refusal skills reduced binge drinking by 5%).

Health gain

The study did not report any health gain data.

Future cost savings

The study did not report any future cost savings data.

Cost-effectiveness

There is some evidence to suggest that school-based interventions reduce alcohol. However, the analysis is unable to conclude whether the reduction in alcohol consumption is worth the extra cost of the interventions.

5.3.5 Intensive motivational interviewing and other counselling programmes (3e)

Effectiveness evidence

Intensive counselling including that offered by self help groups. These groups, typified by Alcoholics Anonymous, offer emotional support and a model promoting abstinence for people recovering from alcohol dependence using a standard 12-step approach called Twelve Step Facilitation (TSF). Alcoholics Anonymous (AA) is an international organisation of recovering alcoholics. It offers emotional support and a model of abstinence for people recovering from alcohol dependence using a 12-step approach. As well as AA, there are also alternative interventions based on TSF type programmes, some self-help and some professionally-led. AA

and other 12-step approaches are typically based on the assumption that substance dependence is a spiritual and a medical disease.

Effect

- There is insufficient evidence to determine the effectiveness of AA and similar programmes in reducing relapse in people recovering from alcohol dependence.

AA may help patients accept treatment and keep patients in treatment more than alternative treatments, though the evidence for this is from one small study that combined AA with other interventions and should not be regarded as conclusive. Included studies did not allow a conclusive assessment of the effect of Twelve Step Facilitation in promoting complete abstinence. This conclusion is based on a systematic review of RCTs (Ferri et al, 2006).

Economic evidence

No economic evidence identified

5.4 Preventing the uptake of and harm from illicit drugs

5.4.1 Education in schools (4a)

Effectiveness evidence**Intervention**

School based programmes for primary or secondary school children, aimed at prevention of illicit drug use. These can include skills focused programmes aimed at improving drug refusal and life skills, knowledge focused programmes aimed at describing biological, and psychological effects of drug use to build negative attitudes toward drugs, and affective focused programmes aimed at building self-esteem or self-awareness.

Effect

- School based programmes focusing on developing life skills to avoid drug use have a high effect on drug use outcomes.

The evidence suggests that skills focused school programmes can reduce cannabis and hard drug use. Although knowledge focused and affective focused school programmes improve drug knowledge, there was insufficient evidence on which to base conclusions about their effects on drug use outcomes. These conclusions are based on a systematic review of RCTs (Faggiano et al, 2005).

Economic evidence

The review identified 1 study from the USA (Caulkins et al, 1999) that assessed the cost-effectiveness of education in school (life skills training) to prevent the uptake of illicit drug use.

Cost

There is strong economic evidence to suggest that, when compared to no intervention, a life skills training program costs £124 per participant. Caution must be applied when transferring this result to the UK, as the evidence was collected from the USA.

Effect

An economic model suggests that, as a result of the intervention, program participant consumed 3.8 grams of cocaine less in the year following the intervention. The quality of the economic model was not assessed as part of this research.

Health gain

No health gains were reported.

Future cost savings

There is strong evidence to suggest that £297 in public sector costs is saved per participant in the year following the intervention. Caution must be applied when transferring this result to the UK, as the evidence was collected from the USA.

Cost-effectiveness

There is strong evidence to suggest that life skills training in school produces public sector cost savings that exceed the cost of the intervention.

5.4.2 Needle exchange schemes (4b)

Effectiveness evidence

Intervention

Needle and syringe exchange programmes allow injecting drug users to bring their used needles and syringes to be exchanged for new clean ones. These programmes aim to reduce transmission of blood borne illnesses such as HIV by reducing risky practices such as needle sharing, borrowing, lending or reuse.

Effect

- Needle and syringe exchange programmes are estimated to have a high effect on HIV prevalence.

This evidence suggests that needle and syringe exchange programmes reduce the prevalence of HIV, as well as HIV risk behaviours. These conclusions are based on a systematic review of observational studies (WHO, 2004).

Economic evidence

No economic evidence identified

5.4.3 Methadone and other substitution programmes (4c)

Effectiveness evidence

Intervention

Maintenance (substitution) therapy with oral methadone or sublingual buprenorphine for opioid dependence. Maintenance therapy aims to provide stability and improve function by reducing craving, preventing withdrawal, removing the risks associated with injecting, and removing the need to obtain illicit opioids. The aim is for people to progress from maintenance to detoxification and then abstinence.

Effect

- There is evidence that methadone maintenance has a high effect in reducing illicit opioid use.

Methadone maintenance treatment has been shown to reduce the risk of illicit opioid use, as well as increasing the likelihood of staying on treatment. Observational and non-randomised studies have also suggested that it may reduce mortality and improve HIV risk behaviours. Buprenorphine maintenance treatment has been shown to improve the likelihood of staying in treatment. One small study has suggested that buprenorphine reduces mortality compared with placebo and counselling. High dose methadone reduces illicit opioid use more than low fixed dose buprenorphine, but the differences between other doses and dosage schedules is less clear. NICE has recommended that if both drugs are equally suitable for a patient that methadone should be prescribed as the first choice (NICE, 2007c). These conclusions are based on a systematic review of RCTs and other study types (Connock M et al, 2007; NICE, 2007c).

Economic evidence

No economic evidence identified.

5.4.4 Screening/identification of users (4d)

Effectiveness evidence

Intervention

Routine screening using brief standardised questionnaires in primary care settings to identify people using illicit substances such as cannabis, cocaine, and opiates. People identified as drug users would then be targeted for intervention.

Effect

- No estimate of effectiveness of routine screening for illicit substance use possible because of insufficient evidence.

Although there is fair evidence that brief standardised questionnaires have acceptable accuracy and reliability in screening for illicit substance use, it is unclear how well these tools would perform in a primary care setting. There is insufficient evidence regarding the effects of routine screening in primary care using these questionnaires on health outcomes. These conclusions are based on two systematic reviews, which included systematic reviews, RCTs, and observational studies (U.S.Preventive Services Task Force, 2008).

Economic evidence

No economic evidence identified.

5.4.5 Support program for vulnerable young people (4e)

Effectiveness evidence**Intervention**

There are a wide variety of community based programmes to support vulnerable children and young people. These conclusions that follow focus on the interventions recommended by NICE: family based structured support programmes for children at risk, group based programmes for children with behavioural problems and their parents, and motivational interviewing for young substance misusers.

Effect

- Community based support interventions for vulnerable children and young people are estimated to have a moderate effect on use of cannabis, tobacco and alcohol.

There is evidence that family based structured support programmes for vulnerable and disadvantaged children and young people (aged 11 to 16 years) can reduce substance use in the long term. There is evidence that targeted group based programmes for children aged 10 to 12 years with aggressive and behavioural problems and their parents reduce alcohol, tobacco and cannabis use in the medium term. Short term motivational interviewing for young people aged under 25 years with problematic substance abuse can reduce use of cigarettes, alcohol and cannabis in the short term (up to 6 months), but this may not last in the medium term. These conclusions are based on a systematic review of RCTs, non-randomised controlled trials, and before and after studies (NICE, 2007a).

Economic evidence

The review identified 2 studies from the USA (Zarkin et al, 2002; and French et al, 2003) on the cost-effectiveness of counselling interventions for individuals at risk of illicit drug use.

Cost

There is good economic evidence to suggest that extending a 6 week program of CBT to a 12-14 week counselling program plus parental education and home visits costs £1597 more per participant.

There is strong economic evidence to suggest that, when compared to a standard counselling program with adolescents, a 3-session educational counselling program costs £95 more per participant.

However, the evidence for both these interventions is collected in the USA and caution should be taken when transferring these estimates to the UK.

Effect

There is strong evidence from one RCT study to suggest that, when compared with a standard counselling program, a 3-session educational counselling program results in reductions in illicit drug use.

Health gain

No health gains were reported.

Future cost savings

There is strong evidence to suggest that adolescents receiving 12-14 week CBT program with parental education and home visits cost the public sector more over the 12 months following the intervention than those receiving a 6 week program of CBT. However, the evidence for this intervention is collected in the USA and caution should be taken when transferring these estimates to the UK.

Cost-effectiveness

The evidence suggests that:

- Educational counselling sessions are most costly and result in less drug use than standard counselling sessions. However, the analysis cannot conclude whether the resulting reduction in drug use is worth the extra cost of educational counselling.
- A 12-14 week program of CBT with enhancements is more costly than a 6 week program of CBT and that those attending the longer program go on to cost the public sector more post-intervention than those attending the shorter program.

5.5 Reducing the incidence of STIs and teenage pregnancy

5.5.1 Partner notification schemes (5a)

Effectiveness evidence

Intervention

Partner notification (informing partners of patients of their potential exposure to infection) is a common strategy to control sexually transmitted infection. There are three main referral strategies: patient referral (where the index patient notifies his/her partner or partners), contract referral (where a patient agrees to notify their partners, but if they fail to visit the health clinic by an agreed date the partners are notified by health care professionals), provider referral (where the partner is notified by health care professionals).

Effect

- There is evidence that partner notification has a low effect on rate of persistent infection or re-infection with gonorrhoea or chlamydia in males and females with an STI.

The evidence suggests that partner notification can be effective in reducing persistent or recurrent gonorrhoea or chlamydia infections in index patients. There was insufficient evidence about the effects of partner notification on these outcomes in index patients with syphilis or HIV. However, the outcome of persistent or recurrent infection of the index patient would not be appropriate for assessing the effects on people with HIV. These conclusions are based on a systematic review of guidelines, systematic reviews, RCTs, non-randomised controlled studies and observational studies (NICE, 2007d; Trelle et al, 2006; Low et al, 2006).

Economic evidence

The review identified 1 study from the USA (Cohen et al, 2004) that assessed the cost-effectiveness of partner notification schemes for reducing STIs.

Intervention cost

There is strong evidence to suggest that the cost of partner notification is £143 per couple.. However, the evidence is collected in the USA, and caution should be taken when transferring these estimates to the UK.

Effect

The evidence suggests that partner notification is associated with increased condom use. However, the reliability of the study in which this evidence was collect could not be verified.

Health gain

No data on health gain.

Future cost savings

No data on future cost savings.

Cost-effectiveness

The evidence suggests that partner notification increases condom use. However, the analysis is unable to conclude whether the increased condom use is worth the extra cost of the partner notification schemes.

5.5.2 Individual risk counselling in clinics (5b)

Effectiveness evidence**Intervention**

Individual risk counselling, defined here as any one to one interventions, delivered by a counsellor to at risk groups with the aim of reducing incidence of STIs or risky behaviour. Individual risk counselling can be delivered through clinics (genitourinary medicine, abortion, or drug and alcohol misuse clinics), community health services, GPs, and other community and non-healthcare settings. Counselling could be brief or more focused, covering skills building, and clinic based sexual education.

Effect

- There is evidence that individual risk counselling (one to one interventions), either targeted to high risk individuals or to high risk behaviours has a moderate effect on the incidence or prevalence of STIs (including HIV).

Randomised and other controlled trials suggest that one to one counselling about risk can reduce HIV, STIs and pregnancy rates. These conclusions are based on two systematic reviews of systematic reviews, RCTs, non-randomised controlled studies and observational studies (Downing et al, 2008; NICE, 2007d; Bunn et al, 2006).

Economic evidence

The review identified 2 studies from the UK (James et al, 1998; and Kalichman, 2005) , 1 study from the USA (Cohen et al, 2004) and 2 studies for which the location was not stated (Boyer, 1997; and Bolu, 2004) that assessed the cost-effectiveness of counselling to reduce STIs and teenage pregnancy.

Intervention cost

There is strong economic evidence from the UK to suggest that counselling interventions cost between £74 and £164 per person. There is good evidence from outside the UK to support this magnitude of costs, with costs ranging from c£30 per person to £197 per person for behavioural skills counselling.

Effect

The evidence from the UK is mixed, with some counselling sessions being associated with an increased incidence of new STIs and other with a reduced incidence of STIs. The evidence from non-UK studies is more favourable, with reduced incidence of STIs and increased condom use being observed following counselling.

Health gain

The studies reported health related quality of life gains following counselling ranging from 0.002 (behavioural skills counselling outside the UK) to 0.05 QALYs (tailored skills counselling in the UK).

Future cost savings

No studies reported future cost savings.

Cost-effectiveness

Focusing on the UK-based studies suggests that the costs of counselling interventions are exceeded by the monetary value of the health related quality of life gains produced by the interventions. The non-UK based studies produce mixed results. However, the calculations are subject to two limitations. First, they are based on benefits that are measured over a short timeframe. Second, they ignore public sector cost saving associated with reduced STIs.

5.5.3 School education programmes (5c)

Effectiveness evidence**Intervention**

Programmes delivered with the school as a base. Includes school education programmes delivered to groups (not one to one sessions), role-play, discussions and skills training. Some programmes also include provision of condoms and clinic services.

Effect

- Sex education is estimated to have a low effect on intermediate outcomes such as sexual behaviour (likely to be self-reported).

A systematic review of reviews concluded that there is sufficient evidence to suggest that school based interventions can be effective. The reviews do not consider effects of interventions on disease prevalence or infection rates. These conclusions are based on a systematic review of other reviews, which did not present quantitative results (Downing et al, 2008; NICE, 2007d).

Economic evidence

The review identified 2 studies from the USA (Wang et al, 2000; and Cohen et al, 2004) that assessed the cost-effectiveness of school education programmes for reducing STIs and teenage pregnancies.

Intervention cost

There is good evidence to suggest that a school based multiple session cost £183 per student and the Safer Choices for high school students project cost £25 per student. However, the evidence for both these interventions is collected in the USA and caution should be taken when transferring these estimates to the UK.

Effect

The outcomes for both the interventions are measured in terms of condom use. School based multiple sessions are associated with a 29% increase in condom use at 7 a month follow-up, and the Safer Choices with a 29% increase in condom use at a 7 year follow-up.

Health gain

No data on health gain.

Future cost savings

The Safer Choices program was associated with a saving in public sector costs of £4 per person over the 7 years following the intervention.

Cost-effectiveness

The evidence suggests that both the interventions identified increased condom use among students. In the case of the multiple sessions within school, the analysis is unable to conclude whether the increase in condom use was worth the cost of the intervention. However, the evaluation of Safer Choices measures the public cost savings associated with the increased condom use and demonstrates that these exceed the cost of the intervention.

5.5.4 Mass media campaigns (5d)

Effectiveness evidence

Intervention

Mass media campaigns use the media (TV, radio, internet, posters, billboards) to target thousands of individuals with a health message. Mass media interventions to improve sexual health could be aimed at reducing sexually transmitted disease, reducing teenage pregnancy, encouraging HIV testing, promoting safer sexual behaviour. This does not include campaigns delivered to smaller groups (e.g. schools) such as the abstinence only programmes.

Effect

- There is evidence that mass media interventions have a low effect on uptake of HIV testing.

There is limited evidence of the effects of mass media campaigns on STIs. However, the evidence suggests that mass media campaigns can increase uptake of voluntary counselling and testing for HIV. There is no evidence of effect in relation to other STIs. These conclusions are based on a systematic review of RCTs, non-randomised controlled trials, and time series studies (Vidanapathirana et al, 2005).

Economic evidence

The review identified 1 study from the USA (Cohen et al, 2004) that assessed the cost-effectiveness of mass media campaigns to reduce STIs and teenage pregnancy.

Intervention cost

There is strong evidence to suggest that the cost of a mass media campaign to reduce STIs and teenage pregnancies is £4 for each person reached.

Effect

There is evidence of unconfirmed validity that mass media campaigns resulted in a 228% increase in condom use in 17-30 year old age group and 63% in the 31-45 year old age group.

Health gain

No data on health gain is reported.

Future cost savings

No data on future cost savings is reported.

Cost effectiveness

Mass media campaigns seem to increase condom use. However, the analysis is unable to conclude whether this increase in condom use is worth the cost of the media campaign.

5.5.5 Screening for STI (5e)

Effectiveness evidence

Intervention

Proactive screening which invites people in the general population (usually within a specific age range) to screening. Opportunistic approaches to screening (e.g. screening for STIs at genitourinary medicine clinics, screening pregnant women) are not considered.

Effect

- There is evidence that proactive screening for chlamydia has a high effect on incidence of pelvic inflammatory disease, particularly in women considered at high risk of chlamydia infection.

Although there was insufficient evidence from poor quality RCTs to assess whether proactive screening has an effect on the prevalence of chlamydia in school or general population samples, there is evidence from other RCTs that it reduces the incidence of pelvic inflammatory disease. This suggests that it must have an effect on the incidence of chlamydia. Evidence on proactive screening for other STIs is limited. These conclusions are based on three systematic reviews, which included systematic reviews, RCTs, non-randomised controlled studies and

observational studies (NICE, 2007d; Low et al, 2006; Chou et al, 2005; U.S.Preventive Services Task Force, 2004).

Economic evidence

The review identified 2 studies from the USA (Phillips et al, 2000; and Mehta et al, 2002) that assessed the cost effectiveness of screenings for STIs.

Intervention cost

There is strong evidence to suggest that cost of screening and testing for gonorrhoea and chlamydia was between £21 and £39 per person more than emergency department standard practice. The cost of screening and testing for HIV was between £82 and £99. However, the evidence is collected in the USA, and caution should be taken when transferring these estimates to the UK.

Effect

No effect data is reported.

Health gain

Screening and testing for HIV was associated with an improvement of health related quality of 0.005 QALYs per participant over their lifetime. Using the lower bound of the NICE shadow prices for a QALY of £20,000, the QALYs gained can be valued at £100 per person

Future cost savings

The public sector costs saved as a result of screening ranged from -£0.6 to £60 per participant over the 10 years following the intervention. The increase in public sector costs was associated screening when it was not employed in conjunction with standard emergency department procedures. The highest cost savings were associated with a combination of screening and treating.

Cost-effectiveness

The evidence suggests that when screening for gonorrhoea and chlamydia is combined with treatment the public sector costs resulting from the intervention exceed its costs. Some instances of screening of all patients also produce a net benefit, but screening of those identified as at risk of infection at best manages to break even. Screening for HIV produces a lifetime gain in quality of life that justifies its cost.

5.6 Promoting breast feeding

5.6.1 Mass media campaigns (6a)

Effectiveness evidence

Intervention

Mass media campaigns aim to reach a wider target audience to promote breastfeeding through television, news, magazines, or the internet.

Effect

- No estimate of effect for mass media campaigns on breastfeeding initiation or continuation possible because of insufficient evidence.

Evidence to support the effectiveness of these media campaigns in promoting the initiation and continuation of breastfeeding is limited and of poor quality. These conclusions are based on a systematic review, which identified two observational studies. Both campaigns were conducted greater than twenty years ago and are likely to be outdated (Fairbank et al, 2000).

Economic evidence

No economic evidence identified.

5.6.2 Antenatal education (6b)

Effectiveness evidence

Intervention

Education given in the antenatal period aimed at increasing the numbers of women who breastfeed. It can include interactive health education in small informal antenatal groups providing factual and practical information or peer support groups on breastfeeding issues led by non-professionals e.g. mothers who have successfully breastfed. Some peer support groups may extend into the postnatal period.

Effect

- There is evidence that health education in small informal groups during the antenatal period has a high effect in increasing the uptake of breastfeeding.

Health education in small informal groups during the antenatal period can increase breastfeeding rates. There is limited evidence that peer support groups are effective in increasing rates of initiation of breastfeeding amongst women of low income groups. There is less evidence available for effectiveness in women who are less motivated to breastfeed. These conclusions were based on two systematic reviews of RCTs and non-randomised controlled trials (Dyson et al, 2005; Fairbank et al, 2000).

Economic evidence

No economic evidence identified.

5.6.3 Post-natal care for lengthening duration of breast feeding (6c)

Effectiveness evidence

Intervention

Postnatal support aimed at increasing breastfeeding duration. This can include a variety of interventions, including peer support groups, extra one on one support, or interactive health education. Peer support groups focus on breastfeeding issues and are led by non-professionals e.g. mothers who have successfully breastfed. Extra one on one support during the postnatal period can be provided either via professionals (medical, midwifery, health visitors) or lay supports (voluntary or remunerated). Many breastfeeding supporters receive WHO/UNICEF lactation counselling course training. Interactive health education involves small informal postnatal groups (with/without antenatal care) providing factual and practical information.

Effect

- Extra one to one support by either a professional or trained lay supporter during the postnatal period has a moderate effect in promoting continuation of breastfeeding among women who wish to breastfeed.

There is evidence that extra one to one support by either a professional or trained lay supporter during the postnatal period can be effective in increasing the duration of breastfeeding amongst women who wish to breastfeed. There is limited evidence that peer group support can be effective, particularly in women of low income groups. Most trials are in women breastfeeding or wishing to breastfeed and there is less evidence available for effectiveness in women who are less motivated to breastfeed. These conclusions were based on two systematic reviews of RCTs and non-randomised controlled trials (Britton et al, 2007; Fairbank et al, 2000).

Economic evidence

The review identified 1 study from Canada (Steel et al, 2003) on the cost-effectiveness of post-natal care.

Cost

There is good economic evidence to suggest that, when compared with post-discharge telephone follow-ups, home visits after hospital discharge by a public health nurse cost between £17 and £72 per infant. Because this evidence is collected from Canada, caution should be applied when transferring the cost estimates to the UK.

Effect

There is good evidence from a RCT to suggest that, when compared with post-discharge telephone follow-ups, home visits after hospital discharge by a public health nurse result in a 0.8% to a 9% increase in the rate of breast feeding.

Health gain

No health gains were reported.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

The evidence suggests that public health nurse visits are both more costly and more effective at increasing breastfeeding than telephone follow-ups. However, the analysis cannot conclude whether the increased breastfeeding rate is worth the extra cost of nurse visits.

5.7 Promoting health nutrition and dietary patterns

5.7.1 Nutritional counselling in GP or nurse clinics (7a)

Effectiveness evidence**Intervention**

Low intensity nutritional counselling in primary care settings to promote a healthy diet. The counselling is generally brief, but focused, and may include dietary assessment by questionnaire and goal setting. It is delivered by GPs, nurses or other professionals in limited one-on-one sessions to people without known disease or risk factors for diseases that would need more intensive lifestyle change. It is thought to lead to behaviour change and eventually to measurable improvement in dietary patterns (reduced saturated fat, increased fruit, vegetable and increased fibre) in adults. Other general points of nutritional advice, such as reducing salt intake and increasing calcium intake, in appropriate groups, can be included in this intervention.

Effect

- There is evidence that nutritional counselling in primary care has a low effect in improving the core components of a healthy dietary pattern (reduced saturated fat, increased fruit, vegetable and increased fibre) in adults.

There is fair evidence that brief, low to medium-intensity behavioural dietary counselling in the primary care setting can produce small to medium changes in average daily intake of core components of an overall healthy diet (especially saturated fat, fruit, and vegetables) in unselected patients. Although community based studies have evaluated measures to reduce dietary fat intake in children, no controlled trials of routine behavioural dietary counselling for children or adolescents in the primary care setting were identified. These conclusions were

based on a systematic review of RCTs (U.S.Preventive Services Task Force, 2003; Ammerman et al, 2001).

Economic evidence

The review identified 1 study from Australia (Pritchard et al, 1999) on the cost-effectiveness of nutritional counselling in a primary care setting.

Cost

There is strong economic evidence to suggest that, when compared with usual care, nutrition counselling for overweight adults costs £27 per person when undertaken by a dietician and £43 when undertaken by a dietician and a GP. However, the evidence is collected in Australia, and caution should be taken when transferring these estimates to the UK.

Effect

There is good evidence to suggest that, when compared with usual care, counselling by a dietician resulted in a 5.63 kg weight lost per participant over a period of 12 months and that counselling by a dietician and a GP results in 6.71 kg weight lost per participant over a period of 12 months.

Health gain

No health gains were reported.

Future cost savings

No future cost savings were reported.

Cost-effectiveness

The evidence suggests that nutrition counselling in GP or nurse clinics are both more costly and more effective at producing weight loss among overweight patients than usual care. However, the analysis cannot conclude whether the resulting weight loss is worth the extra cost of counselling.

5.7.2 Intensive interventions for promoting lifestyle change (7b)

Effectiveness evidence

Intervention

Intensive interventions for promoting lifestyle change delivered in primary care. These differ from “brief counselling and advice” by being more intensive and often using techniques that require training, such as dietary assessment, enlisting family involvement, providing social support, using group counselling, emphasising food interaction (such as taste testing, cooking), encouraging goal setting, and using advice appropriate to the patient group. They include the broad integrated plans known as chronic disease management, and care or case management, which deliver tailored advice for those with specific conditions. Target populations may include

people with impaired glucose tolerance, diabetes, heart attacks, strokes or those people found to have elevated cardiovascular risk following systematic risk assessment programmes.

Effect

- There is evidence that intensive interventions promoting lifestyle and nutritional change as part of systematic programmes of disease management are highly effective at reducing a range of risk factors.

There was good evidence that medium- to high-intensity counselling interventions produced medium-to-large changes in average daily intake of core components of a healthy diet (including saturated fat, fibre, fruit, and vegetables) among adult patients at increased risk for diet-related chronic disease. The interventions assessed combined nutrition education with behavioural dietary counselling provided by a nutritionist, dietician, or specially trained primary care clinician (e.g., physician, nurse, or nurse practitioner). No controlled trials of intensive counselling in children or adolescents that measured diet were identified. These conclusions were based on a systematic review of RCTs (U.S.Preventive Services Task Force, 2003; Ammerman et al, 2001).

Economic evidence

No economic evidence identified

5.7.3 School nutrition schemes (7c)

Effectiveness evidence

Intervention

Schemes such as the School Fruit and Vegetable Scheme (SFVS), which provide a free piece of fruit, or a vegetable to children aged four to six years, each school day. The SFVS was piloted in more than 500 English schools from 2000 to 2001, and it now distributes around 440 million pieces of fruit and vegetables each year to over two million children in 18,000 schools.

Effect

- School nutrition schemes when part of multifaceted interventions aimed at children are likely to have a moderate effect in increasing fruit and vegetable consumption.

School nutrition schemes aimed at encouraging children to make health food choices and increase fruit and vegetable intake show increases of less than one serving of fruit, over the short term. They are often part of wider multifaceted interventions including mass media campaigns and other initiatives targeted at cooking and meal choice in schools. Free fruit offered to disadvantaged children is likely to reduce health inequalities. These conclusions are based on a systematic review of systematic reviews (Broadstock, 2006).

Economic evidence

No economic evidence identified.

5.7.4 Media campaign 5 a day (7d)

Effectiveness evidence

Intervention

Mass media campaigns and other communication strategies are used in many countries to educate the public about healthy eating choices. In the UK, the 5-a-day programme is an example. In the US, the 'Healthy Eating Pyramid', the '5-a-day for better health' campaign and National Cholesterol Education Programme are well known examples.

Effect

- Mass media campaigns that use a combination of radio, TV, print or the internet to promote healthy eating have a low effect in increasing fruit and vegetable intake.

Mass media promotion of a healthy dietary pattern is often associated with other personal, clinic based strategies and with broader environmental interventions, e.g. taxation change, aimed at supporting healthy food choices. Overall, the mass media interventions work best if the message is tailored to specific groups and if a simple consistent message is promoted. An increase in knowledge can be demonstrated, though few evaluations have shown consistent improvements over the long-term. Overall, the promotion of healthier eating choices appears to be a necessary strategy for improving dietary intake, but is unlikely to be sufficient for most people to change behaviours. These conclusions are based on a systematic review of systematic reviews and observational studies (Ellis et al, 2003).

Economic evidence

No economic evidence identified

5.7.5 Nutrition labelling schemes (7e)

Effectiveness evidence

Intervention

Local or national interventions based around the mandated nutritional labelling of packaged food. These aim to improve consumer understanding and use of the labels when making point of purchase decisions on food selection. They are a potential target for action in creating a supportive environment to enable improved choices in nutrition. The broadly educational initiatives include: the label itself (or redesign of this), supplementing the label with additional benchmarking information, "recommended by" or healthy "ticks" and intensive education schemes based in supermarkets or with sub-groups of at risk individuals to teach common tasks

(identifying nutrients, deciding on overall healthiness, calculating and comparing specific nutrients or total energy).

Effect

- Improvements in nutrition labelling may have a low effect in making the environment more conducive to the selection of healthy food choices.

Improvements in nutrition labelling could make a small but important contribution towards making the existing point-of-purchase environment more conducive to the selection of healthy choices. In particular, interpretational aids can help consumers assess the nutrient contribution of specific foods to the overall diet. These conclusions are based on a systematic review of consumer understanding of labelling (Cowburn & Stockley, 2005).

Economic evidence

No economic evidence identified.

5.8 Promoting health in the elderly

5.8.1 Vaccination (8a)

Effectiveness evidence**Intervention**

Vaccination of people aged 65 and over against influenza. In the UK, trivalent inactivated vaccines are used. The vaccine targets the three most virulent strains in circulation in each given year, based on WHO recommendations.

Effect

- Influenza vaccines in elderly people have a moderate effect on reducing the complications of influenza.

Use of well matched influenza vaccines in elderly people in long-term care facilities during periods of high viral circulation reduces complications of influenza, such as pneumonia, hospital admission, and deaths from influenza or pneumonia. Vaccines tended to be less effective in cases of poor or unknown matching. The effect of influenza vaccines for elderly people in the community is more modest. These conclusions are based on a systematic review of observational studies and RCTs (Rivetti et al, 2006).

Economic evidence

The review identified 3 studies from the USA (Mullooly et al, 1994; Nichol et al, 1994; and Mukamel et al, 2001), 1 study from Belgium (De Graeve, 2000), 1 study from Italy (Gasparini et al, 2002) and 1 study from the Netherlands (Postma et al, 2001) that assessed the cost-effectiveness of influenza vaccination for elderly people.

Cost

There is strong evidence to suggest that the cost of an influenza vaccination ranges from £3.50 to £12, and that pneumococcal and influenza vaccination ranges from £22 to £29.

Effect

There is good evidence to suggest that the vaccination reduces hospitalisations for pneumonia and influenza by 48% to 57%.

Health gain

There is evidence that the pneumococcal and influenza vaccination results in a gain of 0.00242 QALYs. However, no conclusions can be made about the validity of this evidence.

Future cost savings

There is good quality evidence to suggest that the influenza vaccination produces public sector cost savings of between £18 and £204. Other evidence suggests the cost savings are less than these amounts, but the validity of this evidence cannot be verified.

Cost-Effectiveness

The estimates of costs and effects based on evidence that has been validated as being of good quality suggests that influenza vaccination are cost-effective. A vaccination that cost £11 and produced public sector cost savings of £89, and a vaccination that cost £3.50 and produced public sector cost savings of between £18 and £204.

All the evidence is collected from non-UK settings and should be applied with caution when transferring to the UK.

5.8.2 Calcium and Vitamin D for prevention of osteoporosis (8b)

Effectiveness evidence

Intervention

Oral vitamin D supplementation, with or without calcium supplementation.

Effect

- Combined oral vitamin D3 and calcium supplementation when taken together have a low effect on reducing fracture risk in institutionalised elderly adults.

Combined supplementation with oral vitamin D3 (800 IU/day) and calcium reduces fractures among institutionalised elderly adults. The effects of combined supplementation on fractures in community-dwelling older people are inconsistent, but there may be benefit for hip fractures in older community-dwelling women who are compliant with supplementation. The evidence suggests that combined supplementation may reduce falls in older adults, although this benefit may be limited to postmenopausal women. Overall, the evidence regarding the effects of vitamin D supplementation alone did not illustrate a reduction in fractures or falls among older adults. These conclusions are based on a systematic review of RCTs (Maglione et al, 2007).

Economic evidence

The review identified 1 study from the UK (Torgenson et al, 1995) on the cost-effectiveness of giving calcium and vitamin D to elderly people.

Intervention cost

There is good economic evidence to suggest that, when compared to a 'do-nothing' counterfactual, vitamin D and calcium for elderly people costs £245 per person and subcutaneous vitamin D costs £25 per person. This evidence is collected from the UK.

Effect

Compared to a 'do-nothing' alternative, there is evidence that calcium and vitamin D reduces the number of fractures over 3 years by 21% and subcutaneous vitamin D reduces the number of fractures over 4 years by 25%. No conclusions can be made about the validity of these estimates.

Health gain

No health gains were reported.

Future cost savings

No future cost-savings were reported.

Cost-effectiveness

The evidence suggests that influenza vaccination is both more costly and more effective at reducing fractures than a 'do nothing' alternative. However, the analysis cannot conclude whether the reduction in fractures is worth the extra cost of the vaccination.

5.8.3 Screening for osteoporosis (8c)

Effectiveness evidence

Intervention

Routine osteoporosis screening for postmenopausal women. Osteoporosis screening involves DXA scanning to determine bone mineral density.

Effect

- No estimate of effect for osteoporosis screening possible because of insufficient evidence.

There is no direct evidence about the effect of osteoporosis screening on the risk of fractures. There is evidence showing that factors such as age increase the risk of osteoporosis and fractures, that low bone mineral density predicts an increased risk of fracture, and that treating asymptomatic women with osteoporosis can reduce their risk for fracture. This conclusion is based on a systematic review, which identified no trials assessing the effects of routine osteoporosis screening in postmenopausal women on clinical outcomes (Nelson HD & Helfand M, 2002; U.S.Preventive Services Task Force, 2002).

Economic evidence

No economic evidence identified.

5.8.4 Vision screening (8d)

Effectiveness evidence**Intervention**

Vision screening by specially trained nurses or health visitors in a community setting, either alone or as part of a multicomponent intervention for identifying vision impairment in people aged 65 years or over. Once a person with vision problems is identified they can be given advice to visit an optician, referred to a doctor or optometrist, or provided with information about community resources designed to help people with poor vision.

Effect

- Community based vision screening as part of a multicomponent screening package is estimated to have no effect on self reported vision in the elderly.

Community based vision screening of asymptomatic older people (aged 65 years or older) as part of a multicomponent screening package did not result in any improvements in self reported vision compared with no community based screening. There was no evidence of differences in visual acuity between universal vision screening and vision screening targeted specifically at those with other health problems. These conclusions are based on a systematic review of RCTs (Smeeth & Iliffe, 2006). The review did not assess the impact of community based vision screening on falls.

Economic evidence

No economic evidence identified.

5.8.5 Fall prevention programmes (8e)

Effectiveness evidence

Intervention

There are a large number of fall prevention strategies, which target various intrinsic and extrinsic risk factors, such as balance, bone and muscle strength, vision, and home hazards. Strategies may target either one or multiple risk factors, and may be tailored to the individual.

Effect

- Tailored multidisciplinary, multifactorial risk assessment and intervention programmes have a moderate effect on falls.

Tailored multidisciplinary and multifactorial risk factor screening and intervention programmes have also been shown to reduce risk of falling, as have individually prescribed muscle strengthening and balance retraining, home hazard assessment and modification for people with a history of falling, withdrawal of psychotropic medication where appropriate, and cardiac pacing for people who have fallen and have cardioinhibitory carotid sinus hypersensitivity. There is no evidence that brisk walking reduces the risk of fractures. There is insufficient evidence about the effects of other interventions, including untargeted group exercise, cognitive/behavioural programmes, referral for correction of visual impairment, vitamin D supplementation, or hip protectors. These conclusion are based on a systematic review of RCTs (NICE, 2004).

Economic evidence

The review identified 2 studies from the USA (Tinetti et al, 1994; and Rizzo et al, 1996) and 2 studies from New Zealand (Robertson et al, 2001a, 2001b) that assessed the cost-effectiveness of fall prevention programmes for the elderly.

Intervention cost

There is high quality economic evidence to suggest that the cost of fall prevention programmes ranges from c£100-£200 per person for muscle strengthening and balance training to c£800 per person for medication adjustment and behavioural adjustment with an exercise programme. However, because this evidence is from the USA and New Zealand, caution should be applied when transferring these findings to the UK.

Effect

There is high quality evidence to suggest that muscle strengthening and balance training reduces the number of injurious falls by c33%, and good quality evidence to suggest that medication adjustment and behavioural adjustment with an exercise programme reduces the number of injurious falls by 20%-30%.

Health gain

No health gains were reported.

Future cost savings

One study estimated the avoided public sector costs associated with the reduction in injurious falls at £1,962 per person over the 2 years following the intervention. However, because this evidence is from the USA, caution should be applied when transferring these findings to the UK.

Cost-effectiveness

There is good quality evidence to suggest that the public cost savings associated with averting injurious falls as a result of fall prevention interventions exceed the cost of the intervention.

6.0 Discussion

The objective of this research was to inform priority making in public health decision making, by reviewing the high level evidence for the effectiveness and cost-effectiveness of interventions with proven potential to achieve one of the following 8 objectives:

- Reduce smoking rates and prevent harm from smoking.
- Prevent obesity, manage risk factors and address the complications of obesity.
- Prevent dangerous drinking and to minimize harm from alcohol.
- Prevent the uptake of and harm from illicit drug use.
- Reduce the incidence of STI and to reduce the rates of teenage pregnancy.
- Promote breast feeding.
- Promote healthy nutrition and dietary patterns which reduce the complications of illness.
- Promote health in the elderly and prevent diseases associated with age.

Within these 8 areas, the review identified the following interventions that are both effective and cost-effective and which should, therefore, be considered in any prioritisation process::

- Drug therapies for smoking cessation, specifically NRT and bupropion.
- School-based programmes for obesity prevention, specifically interdisciplinary curricula.
- Brief interventions in primary care for high risk drinkers.
- School-based programmes to prevent illicit drug use, specifically life skills training interventions.
- Individual risk counselling to reduce STIs.
- Screening for STIs coupled with treatment.
- Vaccinations for influenza for the elderly.
- Fall prevention programmes for the elderly.

A number of other interventions were found to be effective, but there was insufficient evidence to conclude regarding their cost-effectiveness. In a number of instances this was due to the review being unable to identify any economic evidence. Specifically, no economic evidence was identified for 15 of the 41 interventions. However, the analysis was unable to conclude regarding the cost-effectiveness of another 15 interventions, not because there was no data, but because the economic evidence that was identified took the form of a cost-effectiveness analysis where effectiveness was measured by change in behaviour. As it is not possible to say whether these changes are worth the cost of the intervention, the analysis is unable to conclude whether these interventions are cost-effective.

Given the tight timeframe within which this research was undertaken, these limitations are not surprising. However, it is important to understand the limitations when interpreting the findings of the review. The project was commissioned and undertaken in a period of less than one month. This time constraint has inevitably placed restrictions on the project's depth and breadth. While the methods have been designed to be as transparent and as robust as possible given the constraints, it is important to recognise a number of important limitations, including:

- **Intervention selection:** Interventions were selected for examination in this report based on their prominence in three existing reviews. These interventions are clearly a small subset of all possible public health interventions that might apply across the eight topic areas. The selection method is likely to be biased towards older, more established interventions, with a longer track record; cumulatively more evidence and data, and those favoured by previous reviewers in this field.
- **Levels of evidence assessed:** Effectiveness was assessed by examining existing systematic reviews, and economic evidence was assessed by reviewing the studies identified in recent reviews of economic evaluations of public health interventions. To the extent that evidence exists that has not been identified within the review undertaken, it is possible that this evidence may impact on the conclusions of the review.
- **Intervention definitions:** The interventions that we examined were broad in nature. In-house, we created an *a priori* definition for each intervention, based on the three base reviews that we identified. The definition of interventions employed may itself bias the results in unpredictable ways.
- **Prioritisation method:** The research team developed criteria and weights to rate the effectiveness and cost-effectiveness of the intervention. While the criteria employed are based on existing guidance for reviewing evidence of effect and cost-effect, inevitably the use of any such criteria and weighting system involves an element of judgement. It is possible that a different set of criteria or weights might have changed the rating of the interventions.
- **Preventable burden of disease:** The project was not designed to examine or model the burden of disease that is preventable by each of the interventions that we examined. Preventable burden of disease is likely to be a key variable in determining the relative priority of one public health intervention against others, but this variable cannot be obtained or inferred from the work we have conducted. Users of this report should consult other sources for this information if needed.
- **Current uptake of interventions in the UK:** The project was not designed to examine the current uptake of the interventions in the UK. Without an indication of current uptake, it is not possible to say whether policy initiatives should focus on increasing or simply maintaining uptake. If required, users of this report will need to turn to other sources to help resolve these questions.
- **Assessment of inequalities:** The project was not designed to examine the effects of the interventions on inequalities, nor were such effects taken into account in the way we assessed or rated interventions. However, reducing inequalities is a fundamental goal of public health interventions in this country, and the effect of a public health intervention on inequalities is a factor that should inform its prioritisation.
- **Nature of Outcomes:** The cost-effectiveness of many of the interventions was assessed on intermediate outcomes (e.g. behavioural outcomes such as increased physical activity). However, conclusions regarding the cost-effectiveness of public health interventions require data on health related quality of life or public sector costs saved. As a result, this report will be biased towards interventions for which existing research has provided this data.

- **Applicability to UK context:** The majority of the economic studies identified were undertaken outside the UK. Given the differences in the health systems between jurisdictions, non-UK data on the cost of interventions needs to be treated with caution when it is being used to consider the cost-effectiveness of interventions for the UK.

Further discussion of these limitations is available in appendix 1.

Given these limitations, the findings of this research should be taken as an assessment of how different interventions compare in the existing literature. A more robust research project to prioritise investments in public health interventions would useful involve the following additions to the research reported in this report:

- **A consultative scoping phase.** Further research should involve public health experts and other stakeholders to identify and describe any interventions for study, as well as agree the criteria against which the effectiveness and cost-effectiveness of interventions should be assessed.
- **A more thorough review of the evidence.** Further research should examine lower levels of effectiveness evidence in addition to existing systematic reviews, and undertake a more thorough review of the economic evidence.
- **Preventable burden of disease.** Further research should incorporate robust methods to establish preventable burden of disease.
- **Current uptake.** Further research should incorporate robust methods to quantify the current degree of uptake of the interventions examined.
- **Inequalities.** Further research should examine the effect of interventions on inequality.
- **Modelling health gains and cost savings.** Further research should include robust modelling of longer term health outcomes, QALYs and public sector cost savings if currently unavailable in the existing literature.

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